Vanderhoof Land and Resource Management Plan

File: 204-20/LRMP-VA

To: All Members of the Vanderhoof Land and Resource Management Planning Team

Re: Approval and Direction to Implement the Vanderhoof Land and Resource Management Plan

On behalf of Cabinet, we are pleased to confirm that we have approved the Vanderhoof Land and Resource Management Plan (LRMP) and have conveyed it to all participating ministries for implementation. The Prince George Interagency Management Committee is now responsible for ensuring that the Vanderhoof LRMP is implemented, monitored and reviewed.

Thank you for the-considerable dedication and effort that you brought to the table in developing this plan for the management of land and resources in the Vanderhoof LRMP area. Your ability to achieve a broad consensus for land and resource management has contributed, in a significant way, to the Provincial Land Use Strategy and we are confident that your past and ongoing commitment to Land and Resource Management Planning will lead to successful plan implementation in the Vanderhoof LRMP area.

David Zirnhelt
Minister of Forests

Dan Miller
Minister of Employment
and Investment

Cathy McGregor
Minister of Environment,
Lands and Parks

Executive Summary

The Vanderhoof Land and Resource Management Plan (LRMP) is a full consensus strategic plan for all aspects of land and resource management within a 13 800 square kilometer area, built through participation by the public, local industry and government resource agencies. This Plan results in stability for all resource-based industries such as tourism and timber, six Protected Areas and an improved outlook for tourism and wildlife - particularly for grizzly bear and woodland caribou.

Who was involved?

The Vanderhoof Land and Resource Management Plan (LRMP) was built over a two and a half year time-frame by a core group of 35 people, representing over 600 years of combined local experience and knowledge. In addition to this group, intermittent participation and general interest was expressed by more than two hundred people, all of whom kept apprised of the planning process through regular Newsletters. The

planning group consisted of a solid cross section of public participants with local, regional and provincial interests, and agency staff. The participants represented a wide range of values, including water, fisheries, heritage, culture, recreation, tourism, wildlife, agriculture, mining, timber, access and conservation interests. The LRMP Table worked with an "open door" policy, using interest-based, rather than sector-based, negotiations.

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

What happened?

This LRMP divides a 1.38 million hectare land base into twenty Resource Management Zones (RMZ), which settle into five different categories.

Settlement/Agriculture RMZ - Representing 14.7% of the land base, this zone manages Crown Lands consistently with the historic pattern of settlement and agriculture in the Nechako Valley and it is consistent with the Vanderhoof Crown Land Plan.

Resource Development Emphasis RMZ - Incorporating 56.7% of the land base, the management on these lands emphasizes the development of resources such as mineral extraction and timber harvesting, while minimizing impacts on other resources through a variety of integrated resource management strategies.

Multi-Value Emphasis RMZ - Incorporating 17.8% of the Plan area, these lands are managed for a wide array of resource values, often by dividing the Resource Management Zone into subzones.

Special RMZ - 4% of the land base is managed in Special RMZs, to conserve one or more resource values such as habitat, scenery and recreational opportunities. The Upper Blackwater RMZ is overlapped by the Cariboo-Chilcotin Land Use Plan (CCLUP) and management direction from the Vanderhoof LRMP is consistent with, and a refinement of, the CCLUP.

Protected Areas - Six RMZs have Protected Area status. The LRMP Table was able to reach consensus on a 6.8% target recommended by the Province's Resource Management Division, and the chosen areas are compatible with the Regional Protected Area Team's initial recommendations. All the Protected Areas stand alone as functioning units within the Vanderhoof Plan area.

- Stuart River (8 000ha) - This corridor provides high-value habitats, including critical salmon habitat and deer and elk winter ranges. It also holds important cultural

heritage values for the Carrier people, including the historic Chinlac village site.

- Sutherland River (4 700ha) - Located in the northwest portion of the plan area, this valley is unique in that it is part of the Skeena River drainage system and is a main spawning stream for sockeye, kokanee and steelhead from Babine Lake. This area contains important grizzly bear ranges.
- Francois South (7 000ha) - With its steeply rising terrain on the south shore of Francois Lake this zone is valued for its visual quality, in addition to providing for Provincial biogeoclimatic representation objectives. To residents and the recreational users of the lake, the pristine vista and wilderness characteristics provide an accessible natural setting.
- Nechako Canyon (1 300/ia) - Featuring the geologically unique Nechako River gorge which was dried through the construction, of the Kenney Dam, this Protected Area supports spectacular recreational opportunities in an area rich with archaeological sites.
- Finger-Tatuk (17 400/ia) - Located in the southeastern portion of the plan area, this zone significantly contributes to the maintenance of provincial and local biological diversity. Its wide range of lake sizes across a landscape interconnected by wetland and riparian corridors provides important habitat features, such as grizzly habitat. Recreational opportunities and archaeological values are additional key interests for this area.
- Entiako (55 100ha) - The largest of the Protected Areas, this zone rests in the southwest corner of the plan area and contains critical winter range for the Tweedsmuir-Entiako caribou herd, in addition to providing backcountry tourism opportunities. The Entiako, combined with lands already protected in Tweedsmuir Provincial Park, will maintain a very large, and fully functioning ecosystem.

The LRMP has developed three levels of management direction, which taken together fully reflect the vision for land and resource management vision. These levels include:

1. General Management direction, which is applicable to the entire land base,
2. Tailor-made Resource Management Zone direction, and
3. Additional Subzone direction where further fine-tuned detail was required.

The Table identified one area appropriate for Sensitive Area designation - the Euchiniko Sidehills - which provides a locally rare feature of steep, grassy side-slopes, dropping down into a river system. Additionally, the LRMP directs old growth management within the Vanderhoof Plan area to target the management of Douglas-fir.

How is this Plan Different?

There are no unresolved issues in this Plan; the Table reached consensus on every point negotiated. The working group has also developed positive working relationships, which include high trust-levels, extensive individual knowledge on multiple resource values and an ability to negotiate in good faith. This, in addition to the innovative integration of many interests through clear and concise direction supplied in the Plan, will carry the LRMP through a smooth implementation. The LRMP Table has also designed a system of annual public meetings which will assess the successes and challenges of implementing the Plan.

Key Aspects

Public endorsement and smooth transition to implementation is expected, as this Plan articulates the common vision for the land base which the resource managers and the local residents were already striving towards. The only new initiative that was brought into the Plan is the Protected Areas Strategy - which serves to integrate important conservation interests. There has also been general acceptance of the Forest Practices Code, which is reflected throughout the document.

This plan provides for stability and certainty around land use and a positive climate for continued and future investments by all resource-based industries. No job loss is anticipated from implementing the LRMP. The short-term timber supply looks steady while small long-term impacts (estimated in the range of ten percent) are expected to be associated with the base-case, (the management practices which would occur without an LRMP, incorporating the Forest Practices Code and Protected Areas). Recommendations to inventory arable lands around the periphery of the Nechako Valley RMZ will determine the 'best use" between potential agricultural development and woodlot development. As well, Protected Areas, Special RMZs, and Scenic Areas all provide increased certainty to the recreation and tourism industries.

Provincial and regional wildlife interests are meshed with economic interests through integrated resource management strategies applied across the land base, and key habitats are managed with explicit direction. This Plan develops a more positive outlook for caribou than would have been observed without the LRMP by combining critical winter ranges with the Entiako Protected Area and by developing innovative timber-harvesting strategies - such as aggregate harvesting areas consistent with the Forest Practices Code - to manage for habitats outside the Protected Areas.

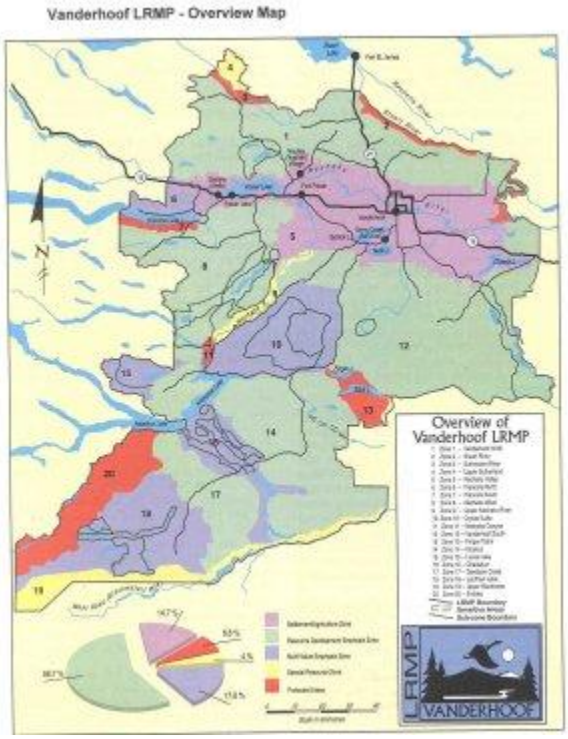
To provide for all licensed and government authorized resource users, general access management principles were developed. Further refinement of these general strategies will be developed in operational level plans. Where public access restrictions are recommended in order to manage critical values such as grizzly bear habitats, public consultation and educational processes are endorsed.

All direction is consistent with the Forest Practices Code and work to guide, rather than fetter, the designated official's ability to implement appropriate management practices. All the policy recommendations identified through the course of developing the Plan were separated out of the LRMP. These have been submitted separately to Government for consideration.

Ratification of the Vanderhoof Land and Resource Management Plan by the planning table occurred on April 13, 1996. Public, local government, First Nations and agency review occurred throughout April, May and June, receiving and documenting strong support for the guidance developed through this Plan. The Omineca-Peace Inter Agency Management Committee (IAMC) endorsement occurred on April 30 and the Land and Resource Management Plan was then submitted to government for review and approval. The Vanderhoof Land and Resource Management Plan was approved in January 1997.

The Vanderhoof LRMP is a wise and realistic plan, developed through a successful consensus-based public involvement process.

1.0 Introduction



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This report contains the Vanderhoof Land and Resource Management Plan (LRMP), covering 1.38 million hectares in central B.C. This sub-regional land use plan is the result of several years of work by a table of public stakeholders and government representatives. Their consensus-based negotiating process considered all interests and values on the land base.

The Vanderhoof LRMP is approved by Government, and will guide land and resource management throughout the planning area. Management direction, and the process used to develop it, are consistent with provincial government policy for Land and Resource Management Planning, as described in the Provincial Land Use Charter (1992) and the LRMP: Statement of Principles and Process (1993). Providing recommendations on the Protected Areas Strategy (PAS) was an integral part of the process.

As part of B.C.'s overall Land Use Strategy, the Vanderhoof LRMP will direct the management of all Crown land in the plan area for the next ten years. As many of the recommendations are innovative, this plan will be subject to monitoring and review as it is implemented. A mid-term review will take place in. the year 2001 (year 5) and the major public involvement process to review and revise this Plan will start in the year 2004 (year 8), to be completed by year 2006 (year 10).

All land use and resource management activities within the Vanderhoof LRMP area are subject to legislation, policies and regulations for Crown Land and resource management, including the Forest Practices Code, which has a significant influence on resource management. The Vanderhoof LRMP will provide the strategic direction to further local operational level planning.

This report contains:

- a description of the social, economic and environmental aspects of the plan area.
- a synopsis of the planning process;
- direction for land and resource management.
- a summary of the social, economic and environmental implications of the Plan's direction,
- recommendations for implementation, monitoring and amendment of the plan.

1.1 The Planning Area

1.1.1 Social & Economic Description

The Vanderhoof LRMP covers more than 1.38 million hectares entirely within the Bulkley Nechako Regional District. The population of approximately 10 000 is centered on the Nechako Plateau, with most people living in the Nechako Valley. About half live in the centers of Vanderhoof, Fraser Lake and Fort Fraser, while the rest live on rural agricultural properties and in smaller rural communities, including the area's First Nations communities of Sai'Kuz (Stoney Creek), Stella (Stellako) and Nad'leh (Nautley).

The largest center, with a 1991 population of 4023, is the District of Vanderhoof. At the junction of Highways 16 and 27, Vanderhoof is a main service center for a wider population, including Fort St. James and Fraser Lake.

Prince George - located 100 km east of Vanderhoof - is the regional service center for post-secondary education (University of Northern B.C. and College of New Caledonia), government services and health care.

To the west, the Village of Fraser Lake, with a 1991 population of approximately 1300, is the second largest center in the Nechako Valley. Located on Highway 16, about 60 km west of Vanderhoof, the village sits at the southwest end of Fraser Lake. Its population has ebbed and flowed with the expansion, closure, and re-opening (1982-86) of the Endako molybdenum mine. Placer Dome Canada Limited's Endako Mine has been a significant economic presence since operations began in 1965. The published mine reserves (January 1, 1995) of 117.6 million tones are enough for another 14-year mine life. The economy of the Fraser Lake area currently depends heavily on forestry and mining and, to a lesser degree, on tourism.

The Nechako Valley communities are healthy and stable, with a strong dependence on forest industry jobs (3 9%). There are five large wood manufacturing operations using timber from within the LRMP boundary, as well as several established value-added operations and First Nations co-ventures such as Dezti 'Wood Products. The area's highly-automated, efficient sawmills have some of the highest lumber recovery rates in the province. More than 20 large logging contractors service the mills and additional indirect employment is generated through trucking, machinery repair, and other forestry support sectors. Vanderhoof and Fraser Lake area mills are significant net importers of wood fiber from surrounding forest districts. Fiber comes in from both inside the Timber Supply Area (TSA) -particularly Fort. St. James - and from outside the TSA - particularly the Lakes Forest District. The Ministry of Forests has offered a 25-year Pulpwood License (PA. 18) to a proponent group (Alcan, Tembec, and the Sinclar Group), but the pulp mill project is still in the very preliminary planning stages.

Based on 1995 statistics, public sector jobs ~ (22%), agriculture (11%), tourism (9%), and mining (7%) round out the major employment sectors. The unemployment rate of 11.8% is higher than the provincial average of 9.8%, partly due to seasonal work in the forest industry.

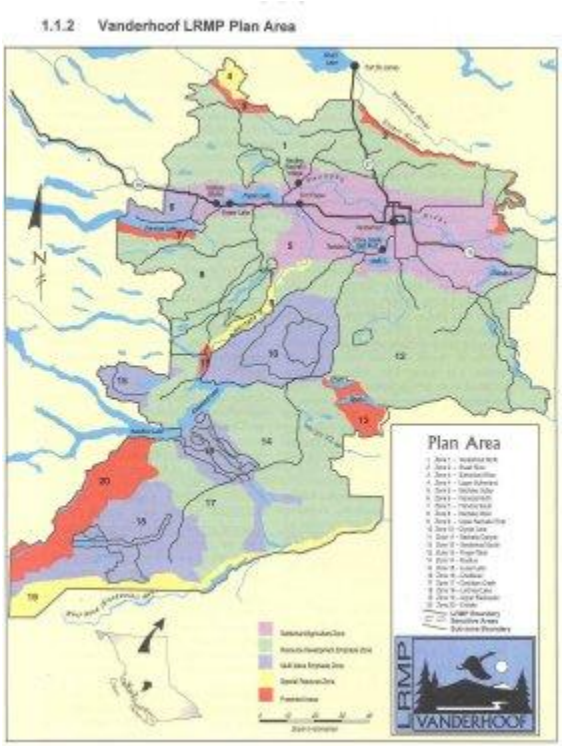
The Plan area's population has grown by 3% since 1986, with higher growth rates observed in Vanderhoof and Fraser Lake. Vanderhoof's population growth is attributed to expansion in wood re-manufacturing and provincial government employment, and to in-migration as lower real estate prices and small town lifestyle attract people from urban centers. Fraser Lake has also benefited from lower levels of in-migration by retirement-age people and former city-dwellers. The abundance of rural acreages supports the blend of fanning lifestyle and forest or mining jobs which are common to this area.

The area's tourism potential lies in the abundant- outdoor recreation opportunities - hunting, camping, fishing, snowmobiling, cross-country skiing, canoeing, and hiking - on the relatively accessible Nechako Plateau, with its almost 1,000 fish-bearing lakes and streams. Events such as fishing derbies, curling bonspiels, sports tournaments, rodeos, fall fairs, trade shows, conferences and the Rich Hobson Cattle Drive, attract additional tourism to the area. Though much of the tourism revenues on the Highway 16 corridor are generated from "stopovers" - people stopping while on trips to Prince Rupert or Alaska - more and more European tourists are taking advantage of

'backcountry' tourism experiences. Twenty-seven resorts and lodges, 39 Forest Service Recreation Sites and 20 major hiking trails currently support tourism and recreation activities in the area. Beaumont Provincial Park, a major tourist stop on Fraser Lake, and a few minor ecological reserves make up the 0.08% of the LRMP land base which was historically managed as established Protected Areas. Additionally, a significant number of residents also see local hunting and fishing as an important part of their lifestyle and/or cultural traditions.

A socio-economic and environmental base case prepared for the LRMP working group and the Socio-Economic Analysis for the Prince George Timber Supply Review (1995) provide a more detailed description of the area's social and economic character.

1.1.2. Physical Description



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The Vanderhoof LRMP operates within the boundaries of the Vanderhoof Forest District which makes up 16% of the Prince George Timber Supply Area (TSA). The TSA incorporates two other Forest Districts – Fort St. James and Prince George – which are adjacent to the Vanderhoof Plan area.

The area is marked by the landscapes of the North Central Interior Plateau and the Nechako Valley, which emerged from a glacial lake basin. The lacustrine soils in the valley bottom are fertile agricultural lands, while the low-rolling to upland terrain of the plateau is mostly forested with sub-boreal spruce and pine. The most distinctive landmark in the area is Sinkut Mountain while the plateau is broken from south to north by the Fawnie Range, Jerryboy Hills, Nechako Range, Tatuk Hills and Holy Cross, Greer,

and Fraser Mountains. In the northwest, Ormond, Shass and Peta Mountains interrupt the plateau landscape.

Beneath the mountains and valleys are various and numerous mineral occurrences, including coal, precious metals and many varieties of industrial minerals. Mining companies are aggressively exploring the plan area to locate those rare high-grade occurrences that are big enough to be mined successfully.

A variety of rivers provide significant geographical relief across the LRMP area. The Nechako River, home to white sturgeon, salmon and sports fish, cares through the valley although its flows are now restricted by the Kenney Dam built in 1952. With its wild stock salmon runs of sockeye and Chinook, the Stuart River forms the northeast boundary to its junction with the Nechako River. In the central portion of the Plan area, one can find the 1.5 km long Nautley River – achieving notoriety as the shortest river in North America. The Sutherland River is located in the northwest corner and is another locally unique watercourse, as it flows northward into Babine Lake and support spawning runs of salmon steelhead and other fish species. To the south, the broad valleys of the Blackwater and Entiako Rivers provide superb trout fishing and ideal habitat for bears and ungulates. Along with seven other nominated BC rivers, the BC Heritage River Board has designated the Blackwater River, a "BC Heritage River."

Large lakes, including Fraser, Francois, Cluculz, Tachick, Nulki and Sinkut, provide recreational rainbow trout fishers, while char are found in Cluculz, Fraser and Francois Lakes. The rolling upland of the plateau is generously dotted with small to medium-sized lakes, a multitude of streams, and a web of wetland systems. This wide variety of fish and aquatic habitats supports a diverse selection of species.

Forests of the area are mostly lodgepole pine and spruce, with scattered patches of aspen and birch. Some Douglas-fir stands are found, but the Vanderhoof LRMP area is approaching this species' northern reaches of its natural range. A history of frequent wildfires has left a natural mosaic of forest ages. Old forests (greater than 250 years) are relatively uncommon in this area, except for the scattered groves of old-growth Douglas-fir, and the few higher elevation mature Engelmann spruce and sub-alpine fir forests.

BC has been divided into 110 distinct geographic areas based on land-form and climate – called ecosections. The four ecosections which divide the LRMP planning area are the Babine Upland, Nechako Lowland, Bulkley Basin, and the Nazko Upland.

Within the LRMP's four ecosections are eight vegetation zones (biogeoclimatic subzones). Each can be described in terms of the dominant tree species that prevails when protected from fire. It is important to note that Lodgepile pine is the dominant tree species across the Vanderhoof area, but for biogeoclimatic classification, each of the zones is characterized by the dominant tree species in a climax or "old growth" state. Most of the vegetation zones are fairly geographically specific or elevational dependent. The above is an attempt to define the eight vegetation zones in simple terms, by describing their location and the types of trees found there.

Vegetation Zone (Biogeoclimatic Subzone)	Description
SBSdk Dry, cool Sub-Boreal Spruce **"Áspen-Spruce Zone"**	Most of this zone is located in the Lakes Forest District, and it is at its eastern extent in the Vanderhoof LRMP. With extensive fire history, much of this area is lodgepole pine and aspen. Douglas-fir is associated with drier sites and bedrock outcroppings, while spruce dominates the older stands.
SBSdw3 Stuart Dry Warm Sub-Boreal Spruce **"Douglas-fir Zone"**	Slightly warmer and wetter than SBSdk, and supporting more Douglas-fir, this very diverse forest zone is located primarily east of Vanderhoof (Bobtail, Chilco and Stuart River areas). The "Douglas-fir Zone" extends outside Vanderhoof to just west of Prince George and north, past Fort St. James, to Inzana Lake.
SBSdw2 Blackwater Dry Warm Sub-Boreal Spruce **"Warm Douglas-fir Zone"**	Most of the zone is located in the Cariboo Region, although a bit of it is found along the Chilako River in the Vanderhoof LRMP. This is the warmest of all vegetation zones in the area with diverse forests characterized (for the Vanderhoof area) by the significant presence of Douglas-fir.
SBSmc3 Kluskus Moist Cold Sub- Boreal Spruce **"Spruce Balsam Zone"**	The predominant vegetation zone at lower elevations in the southeastern portion of the Vanderhoof LRMP (Chedakuz, Tatelkuz, Upper Blackwater and the Finger-Tatuk east of Knewstubb), this zone contains more Sub-alpine fire (commonly called blsam) than the adjacent SBSdk or SBSdw3. Due to the fire history, pine is still the predominant tree type, but if these sites were protected from fire and allowed to move past the pine stage, balsam and spruce would dominate.
SBSmc2 Babine Moist Cold Sub-Boreal Spruce **"Mid-elevation Spruce Balsam Zone"**	This mid-elevation zone (900 to 1200 m) covers the lower slopes of Sinkut Mountain and all of the Savory Ridge, Cabin Lake and Island Lake areas. It also forms a fringe, or band of vegetation, on the south side of the mountainous areas (Nechako and Fawnie Ranges, Naglico Hills). Substantial amounts of this zone exist well outside of Vanderhoof – even as far west as Houston, B.C.
ESSFmv1 Nechako Moist Very Cold Engelmann Spruce - Subalpine Fire **"Mountain Balsam Zone"**	In this highest, coldest type of forest in the plan area (Sinkut Mountain, Nulki Hills, Fawnie and Nechako Ranges, Pitka and Shass Mountains, and other), most precipitation falls as snow. Pine is still predominant, but balsam and Engelmann Spruce are common where stands have been spared from fire.
SBPSmc Moist, Cold Sub-boreal Pine Spruce **"White Spruce Zone"**	Within the Vanderhoof LRMP, this zone primarily follows the Entiako River Drainage. One finger extends up Fawnie Creek to include Johnny and Laidman Lakes, and another extends up the Euchiniko Lakes system. This zone lies in the Coast Mountain rainshadow and is characterized by cold, dry winters and cool, dry, short summers. White spruce is the theoretical climax species, but due to an extensive fire history, lodgepole pine is by far the dominant tree species.

SBPSdc Dry, Cold Sub-boreal Pine Spruce **"White Spruce Zone"**	The driest subzone in the Vanderhoof LRMP, the SBPSdc is found in two locations along the south-eastern LRMP boundary, from the Euchiniko Lakes system to the east, in the area around Hay Lake and along the eastern sections of the Euchiniko River and Taiuk Creek. Although White Spruce is the theoretical climax species, it is not common within the persistent fire-climax lodgepole pine forest. This zone is characterized by cold, dry winters and cool, dry, short summers.

The Vanderhoof LRMP area supports an abundance of wildlife. High on the relatively flat interior plateau, historic conditions were ideal for wildfires to spread regularly across the landscape, establishing a continuous variety of habitats - from open bums regenerating grasses, to young stands thick with trees and shrubs, to decadent lodgepole pine forests ready to burst into flames with another lightning strike. Without mountainous terrain to channel them, the plateau's watercourses meander freely, creating a high concentration of "riparian" habitat (meadows, wetlands and swamps) and support abundant populations of diverse wildlife species.

The area provides ranges for several species of ungulates, the most common of which is the moose as there are many swamp systems close to upland forests throughout the plateau providing an ideal mix of food sources and proximal hiding areas. Moose populations are healthy, with the area supporting a historical increase in these large and odd-looking, yet graceful, creatures. Deer populations are also healthy throughout the area, concentrated in the winter months on steep south-facing slopes where they find a shallower snow pack and the earliest spring forage. Remnant elk herds are localized to isolated areas - the Stuart River elk are often sighted wandering around the Vanderhoof airport.

One of the few species of significant management concern in the LRMP plan area is the woodland caribou. The Tweedsmuir-Entiako herd currently numbers about 500 and appears to be in decline. This herd spends the summer months primarily in Tweedsmuir Park and migrates during the winter to the low elevation forests around Entiako Lake and feed on ground lichens in the south-western part of the LRMP area.

There are relatively few grizzly bears in the area, past and present, as protein-rich food sources exist in low levels throughout the plan area and the bears must establish large home ranges. Human encroachment on grizzly habitat poses the greatest risk to the species; therefore, resource descriptions identify known key ranges along with strategies to minimize human access into these areas. Other predatory mammals reside in the area, such as black bear populations, which have increased in recent years. Wolves thrive on the abundant game species but are most often found in moose-friendly areas. The elusive cougar is known to inhabit the area but its ability to avoid humans allows it to remain a mystery. Smaller predatory mammals, including the commonly-sighted coyote and the lynx, also flourish.

Myriad mammals occupy every available niche - the prickly porcupine, the infamous skunk, water creatures such as beaver and otter and fur-bearers such as marten, fishers, fox, squirrels, rabbits, mice and voles are but a few.

The area also supports an immense diversity of birds. American White Pelicans feed on lakes such as Tachick and Nulki, while the Fraser Lake area is locally known as the "white swan capital" of the world. Large predatory birds such as the Bald Eagle and the Great Gray Owl are present throughout the area. The agricultural fields support a variety of hawks, the Vanderhoof Bird Sanctuary protects one of the key stopovers for migratory species such as the Canada Goose, while song birds, waterfowl, woodpeckers and other migratory species are common throughout the area.

Individual Resource Management Zone descriptions provide a more detailed picture of these natural resources, with supporting information available in the Socio-economic and Environmental Base Case Analysis (1996).

1.2 The Process

1.2.1 Overview

When the LRMP process started in October 1993, local residents responded to an open invitation to participate in a two-day symposium, identifying a range of resource interests to be integrated in a strategic plan. The enthusiasm of the participants who made the long-term commitment to join the planning table never waned. Together, they brought more than 600 years of local knowledge and experience to the development of informed resource management strategies each month.

The group generally met for a two-day session once a month, with a mix of information sessions, small working groups concentrating on individual "Resource Management Zones," and full working group negotiations to develop consensus. Each participant was invited to submit an interest statement or description of their values and priorities.

Resource descriptions, objectives and management strategies were developed by subcommittees with no structured membership. Working group members moved freely between subcommittees to provide input on resources or areas with which they were familiar, allowing for a wide representation of interests. The thoughtful debates between people with diverse values and ideas has led to a wise and realistic consensus plan. The working group reviewed studies on the social, economic, and environmental effects of their draft recommendations before presenting the plan to government

The members of the Vanderhoof LRMP do not directly represent constituencies or sectors of the local economy. They represent a range of values set out in their terms of reference and feel personally accountable to their community, peers and neighbor in developing a Land Resource Management Plan for the local resources.

Range of Values held by Working Group Members

The group was driven by their conviction that stewardship of natural resources can be improved through integrated resource management which considers all values. They agreed to adhere to ecological principles and favored land use decisions which provide for:

- access and opportunities for exploration and development of mineral, coal, placer, aggregate, quarry and industrial mineral resources.
- biodiversity and sustainability.
- conservation of aesthetic features, including landscapes and localized natural attributes.
- conservation of historical, cultural, and spiritual features.
- diverse and abundant wildlife species and their natural habitats.
- diversity of recreational fishing opportunities.
- enhanced areas for recreation access and developed public recreation facilities, with minimal activity restrictions.
- features of the land which attract tourists and opportunities for future tourism operations.
- game animal habitat and a quality hunting experience.
- industrial and economic development generated by timber production.
- intensive agriculture and grazing access.
- large tracts of wilderness, with limited or managed access.
- timber harvesting by small operators.
- trapping industry.

During the process, if working group members noted that any one of these values was not represented, they sought that representation. Although this led to some late entry participation, it also resulted in more complete consideration of all resource management interests.

Key Tools for Consensus

The LRMP working group developed several key tools which facilitated the Land and Resource Management Planning process: a definition for consensus, a format for dispute resolution, and a negotiating framework. The table retained the right to manage its own process and to change any of the terms of reference with consensus.

A Definition for Consensus

Consensus was defined as the ***general agreement*** of all participants on a ***package*** of recommendations. Some of the concepts developed by participants for the LRMP process, included:

- If all participants agree, the working group may define consensus as less than unanimous agreement. Participants may also agree that other decision-making

approaches are appropriate within an overall consensus process.

- Consensus does not mean total concurrence on every aspect of a decision. Participants must be willing to accept the overall decision package.
  Participants may agree to disagree and record areas of disagreement, or may agree to defer a decision.
- If a participant withholds agreement on an issue, he/she is responsible for explaining how his/her interests are adversely affected or how the proposed agreement fails to meet his/her interests. The participant withholding agreement must propose alternatives and other participants must consider how all interests may be met.
- Agreement within the planning group carries an obligation for participants to strongly represent the benefits and decisions on any agreement to their interest groups or peers.
- When initial agreement is achieved, some participants will need to take the agreement back to their constituencies or a higher decision-making authority for ratification.
- Once consensus is reached on the overall package, it is assumed to be binding.

Participants agreed to observe the following principles of consensus-building:

- The purpose of negotiations is to agree.
- Participants will act in "good faith" in all aspects of the process.
- Participants accept the concerns and goals of others as legitimate and will listen carefully, ask questions, and educate themselves regarding others' interests whether they agree with them or not.
- The focus of negotiations is on interests and concerns rather than positions and demands.
- Participants commit to fully explore issues, searching for solutions in a problem-solving atmosphere.
- Participants will make a good faith attempt to share information relevant to the shared decision-making process.
- To facilitate the broadest possible consideration of options and solutions, all agreements and understandings on a single issue will be regarded as tentative until full agreement is achieved on the total package of recommendations.
- Participants are obliged to explain their interests and avoid "stonewalling."

- The table will seek integrated outcomes in its direction, by pooling their resources, originality and expertise.
- All at the table will make a strong commitment to attending and participating in full table negotiations of Resource Management Zones.
- After the draft LRMP and associated socioeconomic and environmental analysis were. compiled in the winter of 1995-96, participants met to fine-tune their consensus-building process. They achieved consensus on the full package of LRMP recommendations in April 1996.

1.2.2 Public Consultation

One of the cornerstones of the LRMP process is public involvement. LRMP participants made presentations and talked one-on-one with peers, constituency groups and community organizations. The group provided public information at community trade shows and distributed newsletters, highlighting the process to all households and businesses in the planning area. Project Updates were mailed after each meeting to working group participants and an additional 200+ interested community members and government staff. The LRMP working group invited the public to participate in providing local resource knowledge to the Resource Management Zone working groups, held open houses and provided presentations to review the draft plan and ensure community consultation and awareness of the process.

First Nations chose not to participate directly in the Vanderhoof LRMP. Local First Nations expressed interest in the process, but maintained a focus on treaty negotiations and land claim issues, as well as realizing staffing and resource constraints. Of the eleven local Bands, only two are not yet formally negotiating Treaties, while the remaining Band's participation ranges from the preliminary stages and development of a negotiating framework, to the negotiation of Agreements in Principles. Local First Nations were apprised of the LRMP progress through personal contacts, formal communications and the LRMP Project Updates.

Although First Nations were not formally represented at the LRMP Table, archaeological, cultural and heritage values were strongly endorsed by the LRMP planning group.

Local governments chose to be periodically involved in the process, and were kept well apprised of the progress. Reaction has been favorable to the community stability and security provided through the LRMP recommendations.

A separately bound Appendix containing Project Updates and public comment is available, to provide documentation of how this LRMP has responded to the public interest in wide and sustainable resource management.

1.2.3 Principles of the Process

The planning process was guided by the standards and principles outlined in Land and Resource Management Planning: A Statement of Principles and Processes (1993). Some of the key principles are:

- Respect and consider all resource values.
- Be consistent with provincial policy and procedures and take direction from provincial strategies; incorporate and respond to any new directions as they emerge.
- Base decisions on the principles of resource sustainability and integrated resource management; land allocation and resource management strategies will consider the environmental capacity of the land to sustain use.
- Provide strategic direction to, and link with, local level planning.
- Strive for consensus between the public, user groups and the resource management agencies.
- Include representatives from all parties with a key interest or stake in the outcome, including resource agencies, those directly affected by decisions and those who could delay or block a decision.

Vision

The vision of the Vanderhoof LRMP working group is to produce a strategic resource plan that will:

be the result of a commitment by all interests to resolve land use issues in a spirit of mutual respect.

establish direction for land use that specifies broad resource management objectives and strategies for Crown Lands within the plan area.

incorporate the principles of sustainable resource development and integrated resource management.

incorporate the principles of biodiversity and sustainable ecosystem management.
provide a forum for future participation in consensus-based decision making by the public, government and First Nations.

The Vanderhoof LRMP working group believes the Vanderhoof LRMP is a wise and realistic land use plan that captures the spirit of this vision.

1.2.4 LRMP Timetable

2.0 Recommended Management Direction

2.1 General Management Direction

General management direction, which applies across the plan area, emphasizes realistic and balanced planning based on area-specific information. Additionally, the working

group looked at what was best in each zone and developed a mosaic of site-specific resource management direction across the LRMP area. Throughout the process, the group maintained its commitment to balancing the economic, environmental and social needs of the people and communities in the plan area.

General management direction is outlined for the Protected Areas and for all of the values and interests identified by the working group, including; fisheries, heritage & culture, recreation & tourism, water, wildlife, agriculture, mining, timber harvesting, silviculture & forest health, and trapping & guiding. Access and lakeshore management strategies, biodiversity guidelines and general information about Protected Areas are also part of the general direction for the plan area.

The plan area has been divided into 20 Resource Management Zones (RMZs), some of which are further classified into subzones. For each RMZ, the category (i.e., Multi-value, Protected Areas etc.) indicates the intensity levels of land and resource management that are appropriate for the zone, the RMZ Intent guides the overall management direction, and objectives and strategies provide further guidance to many types of activities (e.g. recreation, timber harvesting, trapping, mining, etc.). There are five categories of zones in the Vanderhoof LRMP area: Settlement! Agricultural, Resource Development Emphasis, Multi-Value Emphasis, Special and Protected Areas. These are further defined in Section 2.2. applies where a site-specific strategy is not identified for a particular interest in an RMZ, and a cross-reference between the General Management direction and the specific RMZ direction is necessary to gain an accurate understanding of the working group's full management direction for each zone.

2.1.1 Protected Areas

The Vanderhoof LRMP table direction is consistent with direction provided in the Protected Areas Strategy (PAS) and by the Resource Management Division (RMD). In June 1995, the RMD directed the seven established LRMPs and the Mackenzie Planning Table in the Prince George Forest Region to recommend an aggregate 9% of the region for Protected Area status. The Vanderhoof LRIvIP was later directed to work toward a figure of 6.8% Protected Areas, refining the original 9.32% put forward by the Prince George Regional Protected Areas Team. Prior to completion of the Vanderhoof LRMP, only 0.08% of the land base was protected in Beaumont Provincial Park and a few small scattered ecological reserves.

At the January 1996 LRMP meeting, the working group reached consensus on six areas, totaling 6.8% of the LRMP land base, meeting the objectives of the Protected Areas Strategy. The objectives and strategies recommended by this LRMP in Protected Areas reflect the merging of local knowledge with government policy (Resource Management Division 1995) on acceptable uses in such areas.

General recommendations include;

- Endorse the general strategy to **preclude all commercial timber harvesting (including salvage operations) in Protected Areas.** In the event of a severe forest health situation, B.C. Parks should consult with the Ministry of Forests and B.C. Environment to

develop management strategies considering all other values identified in this LRMP.

- Permit, where compatible with specific management strategies in the Protected Areas, or with the Parks Management Plans:
  - Commercial Backcountry Recreation (CBR) activities (e.g. guiding, hiking, horseback riding) and temporary campsites associated with them.
  - Snowmobile use in designated areas.
- Avoid new permanent CBR development (e.g. lodges).
- Endorse the continued monitoring of forest health (beetle populations) by the Ministry of Forests in cooperation with BC Parks, at least until BC Parks staffing and resources are able to accommodate the enhanced stewardship direction included in this Plan.
- Future Parks management planning processes are expected to provide further clarification to forest health management strategies during implementation of this Plan.
- This LRMP recognizes that trapping, hunting and guiding are acceptable activities within a Protected Area. Where an activity is permitted, it is assumed to include transfer of tenure and use of all customary methods and tools.
- Additionally, all Protected Areas have undergone statusing by individual agencies (Lands, Energy and Mineral Division, Forest Service, etc.).

Grazing Policy for Protected Areas

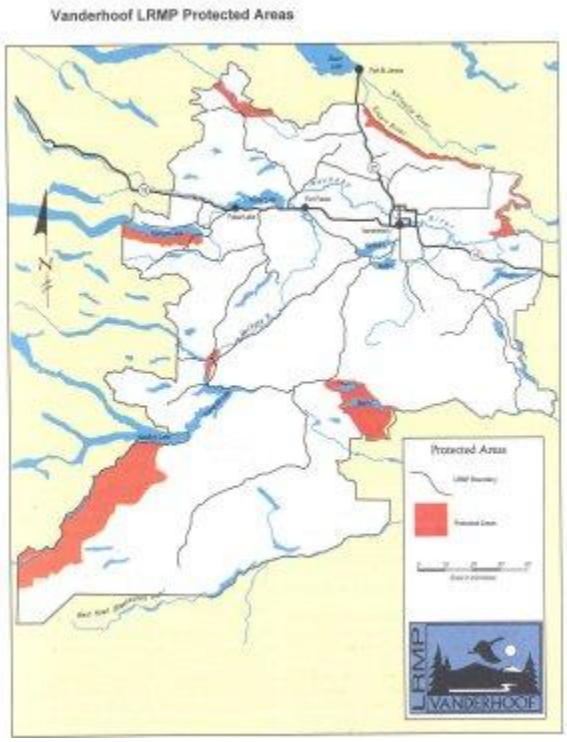
Domestic livestock grazing may be allowed within a newly created Protected Area where it is compatible with the management plan for the area.

Generally, livestock grazing will be included in the Protected Area only if it is already in place at the time of designation. The only Protected Area in this LRMP area currently supporting grazing tenures is the Stuart River RMZ. Within Protected Areas it is also noted that the limited amount of grazing associated with recreational uses (guiding, hunting, trail riding, etc.) is generally acceptable. This direction is further clarified through individual Resource. Management Zone Direction -Section 2.2.

Where grazing is permitted, "benchmarks" will be left un-grazed to represent local ecosystems. These benchmarks, used as controls in evaluating management practices, must be large enough to allow researchers to detect long term biophysical changes. Benchmarks should include the full range of local ecosystems such as wetlands, riparian areas, grasslands, and deciduous and coniferous forests. If full representation cannot be captured in one large benchmark, the Protected Area -may contain several smaller sites connected through special management of surrounding lands. Livestock will be kept out of benchmarks by natural features, fencing or other management tools. The

Ministry of Forest will provide B.C. Parks with administrative assistance on "benchmarks" and grazing management plans.

Summary of Protected Areas in the Vanderhoof LRMP



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The **Stuart River** corridor provides for high-value, critical salmon habitat and deer/elk winter ranges and holds important cultural heritage values for the Carrier people, including the historic Chinlac village site. This Protected Area covers slightly less than 8000 hectares and will complement areas being considered for protection in the adjacent Fort St. James and Prince George LRMP plan areas.

The **Sutherland River** in the northwest part of the plan area was a strongly supported candidate for protection. This valley is unique within the Vanderhoof LRMP area in that it is part of the Skeena River drainage system and provides a portion of the main spawning stream for sockeye, kokanee and steelhead from Babine Lake. The Sutherland River Protected Area covers just less than 5000 hectares.

Francois South, with its steeply rising terrain on the south shore of Francois Lake, this area is valued for its visual quality, and also contributes to both local and provincial biodiversity levels. To the residents on the north- shore and to the recreational users of the lake, the pristine vista and wilderness characteristics provides an accessible natural setting. The Protected Area covers almost 7000 hectares.

The **Nechako Canyon** features the geologically unique Nechako River gorge dried through the construction of the Kenney Dam. The area provides spectacular

recreational opportunities atop one of B.C.'s richest archaeological sites. The Protected Area covers almost 1300 hectares.

The **Finger - Tatuk** in the southeastern portion of the plan area represents a significant contribution to Provincial and Regional biological diversity. Its wide range of lake sizes across a landscape interconnected by wetland and riparian corridors provides important habitat for ungulates, fur-bearers, waterfowl and shorebirds. Additionally, these same features provide myriad recreational opportunities. The Protected Area covers approximately 17000 hectares.

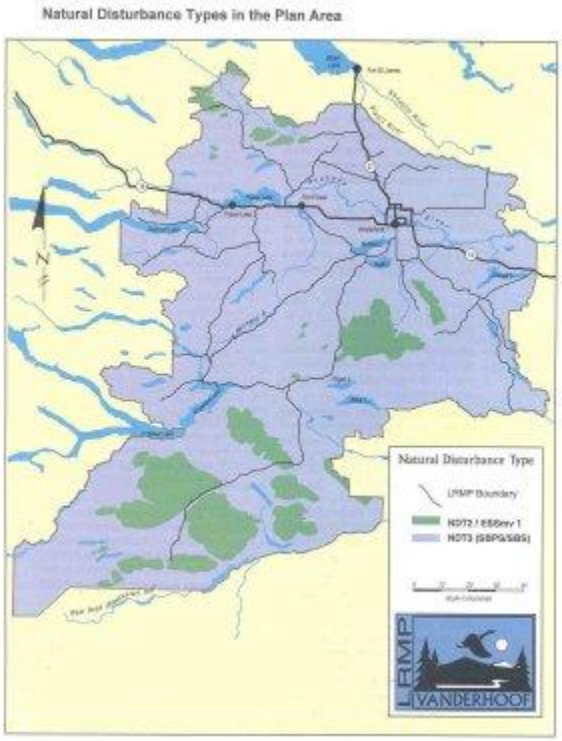
The **Entiako** is by far the largest Protected Area. Located in the southwest corner of the plan area east of the Entiako River, it encompasses about 55000 hectares and contains important winter range for the Tweedsmuir-Entiako caribou herd. The Entiako, combined with lands already protected in Tweedsmuir Provincial Park, will represent a very large and functioning ecosystem. The adjacent Lakes LRMP is also considering protected status for areas west of the Entiako River.

2.1.2 Jobs and Community Stability

The communities of the Nechako Valley are highly dependent on the forest industry and agriculture. The public and service sectors, mining and tourism round out the list of major employers in Vanderhoof, Fraser Lake and the other smaller communities.

- Due to this high dependence on the natural resources, sustainability is a primary interest of the Vanderhoof LRMP
- The LRMP working group also recognizes jobs and community stability as a primary interest, and noted the need for resource and tourism employment to be available for First Nations communities and residents of the remote Upper Blackwater area. LRMP participants also recognized a need for seasonal employment opportunities for youth on break from post-secondary education and residents who are supplementing farm income.
- One objective of this plan is to facilitate additional skilled and semi-skilled job opportunities in resource management such as forestry, wildlife and watershed enhancement.
  There is strong endorsement for the Forest Renewal B.C. programs to provide employment and enhanced skill levels in forest resource management.
- To diversify the local economy, the LRMP recommends promoting Crown Land development through the Land Act and B.C. Ministry of Environment, Lands and Parks programs where appropriate, both within the Vanderhoof Crown Land plan and in other RMZs for commercial, industrial, agricultural, residential, recreational, institutional, utility, aquatic and conservation uses.

2.1.3 Biodiversity



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Biological diversity (or biodiversity) is the diversity of plants, animals and other living organisms and the processes which bind them. The guidance for biodiversity set out by the Forest Practices Code is based on the assumption that the more that managed forests resemble forests established through natural disturbances such as fire, the greater the probability that all native species and ecological processes will be maintained. Not all elements of biodiversity can be - or need to be - maintained on every hectare. The intent is to maintain in perpetuity all native species across their historic ranges. Intensive forestry and other resource development within managed landscapes can be compatible with this objective.

The conservation of biodiversity in this LRMP area depends on a coordinated strategy that includes:

- a system of Protected Areas.
- provision for a variety of habitats at a landscape scale.
- management practices that provide important ecosystem attributes at a site-specific scale.

Many of the stand level management strategies for maintaining biodiversity will be developed and assessed for success by landscape unit planning, a refinement of strategic planning. The task of landscape unit planning will largely be the responsibility of the Ministry of Forests Resource Planners and BC Environment Forest Ecosystem Specialists. The level of public involvement in landscape unit planning is likely to vary,

but this LRMP will provide much of the intent for resource management across the landscapes in this area. Often local knowledge has provided very site specific guidance for the maintenance of biodiversity in individual Resource Management Zones. Landscape units that were delineated for the purposes of resource analysis and are proposed for consideration by the District Manager and Designated Environment Official to form the basis of landscape unit planning are located in Implementation and Monitoring (Section 4.0).

Historically, the forest ecosystems in this area experienced frequent wildfires, ranging from small spot fires to huge conflagrations burning thousands of hectares. Natural bums occurred every 100 to 150 years, and usually contained unburned patches of mature forest that were missed by the fire. Consequently, the forest fires produced a landscape mosaic of even-aged forests of all shapes and sizes, containing mature forest 'remnants. Douglas-fir is the most fire resistant tree species in this area and often is key to determining the amount and distribution of the mature forest remnants. Single veteran Douglas-fir trees can be up to 500 years old. In addition to forest fires, there were also frequent outbreaks of defoliating insects, root diseases and wind throw events which resulted in dead trees, decaying logs and gaps in the forest cover. Wetland areas within the forest landscape provide special habitat characteristics not found in the upland areas.

The Forest Practices Code Biodiversity Guidebook provides direction for managing biodiversity by **Natural Disturbance Type (NDT)**. The Vanderhoof LRMP area is predominantly covered by **NDT3** (ecosystems with frequent stand-initiating events) and, to a lesser extent, by **NDT2** (ecosystems with infrequent stand-initiating events).

The following recommendations for these Natural Disturbance Types are acknowledged by the Vanderhoof LRMP in providing general management direction on biodiversity.

- The Forest Practices Code, the RMZ direction and the Subzone emphasis will all be used to guide the establishment of biodiversity emphasis options at the Landscape Unit planning level.
- Seral stages (different ages and species mixes) should occur in a variety of patch sizes within a landscape unit and follow a distribution appropriate for the Natural Disturbance Type.
- Manage timber harvesting to reflect the seral stage distribution in accordance with the biogeoclimatic zone and disturbance type.
- Even-aged management (harvesting and silviculture) systems with wildlife tree patches most closely simulate natural disturbance types (frequent stand initiating events) in much of this area.
- Maintain a significant component of the landscape unit in communities with plant species composition similar to. that found in communities which have developed through natural dynamics and succession.

- Practices for maintaining stand structures should be considered for all forests.
- Maintain structural forest attributes such as coarse woody debris, wildlife trees, large organic debris, green-trees, etc. on harvest blocks.
- Mimic the natural pattern of connectivity by establishing Forest Ecosystem Networks (FEN) to provide for movement corridors and special areas (e.g., wetland complexes, old growth attributes, etc.). The full spectrum of biogeoclimatic subzones and variants within a landscape unit should be represented. FENs should incorporate variable widths of linkages
- The size range of leave areas should be the same as that for harvested areas.
- Patch sizes greater than 60 hectares can be created by harvesting the entire larger patch at one time and/or by aggregating small cut-blocks over time. In either case, structural attributes (i.e., live and dead trees) consistent with Natural Disturbance Type are to be retained within the patch.
- Old growth management strategies are met primarily by maintaining mature and seral stage requirements as outlined in the Biodiversity Guidebook for NDT3 and NDT2, with a particular emphasis on maintaining the distribution and abundance of Douglas-fir, the most fire-resistant tree species in this area. Old growth management strategies will also incorporate snag/wildlife tree retention and recruitment within harvesting areas.
- Consider partial cutting systems in Douglas-fir and in some spruce and true fir stands, to maintain mature forest attributes.
- Retain some mature Douglas-fir or tamarack in stands where they constitute a minor component of the stand.
- Where Douglas-fir or tamarack is a component of a stand, it should also form a component of the regenerated stand.
- Maintain or enhance rare and uncommon habitats, or plant species and plant associations by identifying them and developing appropriate management plans. Recommend that rare forest stand types within the landscape unit (i.e., those accounting for less than 2% of the area, such as birch, cottonwood, aspen and fir) should be maintained over the rotation.
- Recommend that the proportion and distribution of deciduous (broadleaf) trees should be maintained in managed forests at similar levels to those in non-managed forests within the landscape unit.

Measuring whether LRMP and biodiversity objectives are met will be a focus of landscape unit planning. This LRMP has played a valuable role in clearly describing the resource values and management intent for the 20 Resource Management Zones in the plan area. Landscape units will sometimes parallel the boundaries of the RMZs, but will often cross them in smaller subzones. Landscape unit planning is a much more technical form of planning than the broad land use decisions and social values that were considered in developing the LRMP with community endorsement. The focus for landscape planning, as with operational forest planning, is to meet the broad intent recommended by the LRMP.

This LRMP provides biodiversity recommendations through the direction given for land use at the RMZ level, that can be translated into specific landscape unit objectives at a later date by the resource management agencies.

2.1.4 Water

Maintaining the natural standard of water quality in the plan area is important for many reasons, including the maintenance of fish habitat and community watersheds. Key objectives for incorporating water quality into management plans include minimizing soil disturbance and sedimentation and maintaining natural hydrological regimes (water quantity and timing).

General LRMP direction includes:

- Endorse conducting Level 1 Watershed Assessments as required, based on either the presence of a community watershed or high fisheries values as identified in the LRMP or through Landscape Unit Planning, and incorporate recommendations into resource development plans.
- Endorse conducting higher level Watershed Assessments if indicated by Level 1 results or high fisheries values, and endorse incorporating recommendations into resource development plans.
- Manage streamside and riparian habitat by providing adequate reserves and buffer zones.
- Endorse rehabilitating areas of disturbed or damaged riparian habitat.
- Manage to minimize disturbance of ground cover vegetation in order to limit surface erosion.
- Endorse revegetating all areas of soil disturbance adjacent to watercourses. The use of native vegetation, or practices that promote the establishment of native vegetation are highly preferred.
- Endorse rehabilitating areas of soil, stream channel or other disturbance that may affect water quality.

- Endorse identifying areas of unstable soils or terrain and plan road construction accordingly.
- Endorse the proposal that "no staking placer reserves" be maintained, except where review determines the reserve is no longer needed to protect water quality, fisheries values or other ecological values
- Manage to maintain the ability to access water sources with appropriate water licensing.

2.1.5 Fisheries & Lakeshore Management

Of glacial origin, the Vanderhoof LRMP area's lakes are located atop the North-central Interior Plateau and within the Nechako Valley, providing a wide spectrum of recreational experiences. Lakes range in size from small puddles caught in potholes of rock to some of B.C.'s largest freshwater bodies of water, and in clarity from spring-fed crystalline waters to soupy marsh-like pools. This variety creates a diversity of aquatic and shoreline habitats.

The LRMP working group recommends maintaining the physical and biological diversity of fish and aquatic habitats in accordance with the Forest Practices Code.

General LRMP direction includes:

- Endorse restoring degraded stream habitats and maintaining healthy stream habitats through promotion of improved land management practices and through bank stabilization, revegetation and other stream rehabilitation techniques.
- Endorse conducting . fish habitat inventories to identify fisheries sensitive/critical areas that require protection and site-specific management actions.
- Endorse the recommendation that the cumulative rate of development (forestry, urbanization, agriculture, mining, etc.) within specified watersheds should be balanced with fish habitat requirements.
- Manage to maintain the natural diversity of aquatic habitat elements. · Manage to maintain and/or enhance water quality and quantity for instream uses.
- Endorse identifying watersheds or stream reaches that require enhanced management in order to maintain or rehabilitate water quality or habitat.
- Endorse protecting streamside and riparian areas by providing adequate buffer zones and applying appropriate riparian management.
- Support enhancing salmon habitat and stocks through projects (Section 2.2) or activities identified in the RMZs.

Additionally, this planning process has deliberately not provided policy recommendation on water flow levels or allocation for the Nechako River. A future planning process for these issues is expected to comprise one of the implementation items, and it is addressed in appropriate Resource Management Zones.

With lakes splashed across the landscape in a range of sizes, shapes, aquatic and terrestrial habitats and visual features, suitable lakeshore management requires a similarly wide-ranging variety of management strategies. In order to assist operational level planning, all lakes greater than 5 ha within the Vanderhoof LRMP area will receive a management designation - a Final Lakeshore Classification - which will include both;

- a technical Interim Lake Classification and
- direction from strategic plans, including the LRMP.

The following is a brief outline setting general management direction for implementation of Lakeshore Classification. Evaluation criteria concur with both the LRMP Table's direction for lakeshore management as well as the Prince George Regional Lakeshore Classification Guidebook. Due to the number of lakes located in this Plan area, individual designation will be conducted by a District lakeshore classification team as part of the implementation of this Plan.

A complete listing of classified lakes will be provided as an information resource for the next LRMP. Review of the classification criteria and evaluation of their effectiveness in meeting the management direction defined by this Plan will constitute part of the LRMP monitoring and implementation phase.

Interim Lake classification

To ensure key values are managed appropriately, site-specific lake classification will incorporate:

- Fisheries values
- Wildlife/biodiversity values
- Recreational values, and
- Watershed values.

Each of the four values will be given a management ranking of A, B,C,D, or E, with 'A' designating the widest Lakeshore Management Area (as per the Forest Practices Code). This lettering system does not imply a quality-value to the lake, it simply relates to the amount of lakeshore habitat which should be "reserved.". For example, a lake supporting a pristine viewshed may be able to support selective harvesting; therefore, the amount of lakeshore set into reserves to protect that viewscape may be minimal. Or, opening up a lakeshore area may increase riparian vegetation (i.e., willow or aspen) and improve habitat for some regionally important species (e.g. moose, beaver).

For each lake, the value that requires the largest reserve will determine the Interim Forest Practices Code lakeshore classification (i.e., a "conservative default").

Final Lakeshore Classification

Final lakeshore classifications will incorporate both site-specific lake classifications, the strategic direction supplied by the LRMP and other special values (i.e.,, recreational lot development). This LRMP direction may shift the Final Lakeshore Classification away from the Interim Lake Classification. It may increase the amount of lakeshore left in reserves - to manage additional social values -or it may exempt/reduce the amount of lakeshore left in reserves, where innovative management strategies allow for the maintenance of the aquatic and shoreline habitats. One example of this is Casey Lake, which has been developed as a study site for the Fraser Lake Elementary-Secondary School. If managed for scientific purposes and if the lakeshore management strategies are co-developed and co-managed with the school, then it may be appropriate to exempt this lake from the regular Interim Lake Classification, in accordance with the Forest Practices Code.

The full range and forms of access should be considered when completing the Final Lakeshore Classification, to create a diversity in lake-centered recreational experiences.

The Vanderhoof LRMP provides general direction for lakeshore management at the Resource Management Zone (RMZ) level.

- In general, lakes within Resource Development Emphasis RMZs are more suitable for development of recreational fishedes, increased access (e.g. walk-in trails, wheelchair accessibility) and recreational facility development. Increased levels of recreational use and fishing pressures is a compatible use in high-intensity zones where the fish stocks and habitat can withstand such developments.
- Lakes within Multi-Value Emphasis RMZs have a variety of management objectives based on the site specific characteristics of both the lake and the RMZ.
- In general, lakes within the Special RMZs and the Sensitive Area are more suitable for management as refugia lakes, limited/restricted access lakes and quality lakes.
- Lakes within Protected excellent candidates for fisheries and backcountry recreation development areas are wilderness wilderness

It is expected that within each zone there will be lakes for which the above general guidelines are not applicable, such as lakes requiring higher levels of lakeshore preservation within Resource Development Emphasis zones, or high recreational use lakes within Special zones. Appropriate management will be applied to each lake on an individual basis through a District lakeshore classification team and public consultation.

2.1.6 Heritage & Culture

With a long history of habitation by First Nations, the Carrier people of the area used the waterways, trails and forests as their source of sustenance, transportation and communication. Carrier place names that still remain on lakes, rivers and geographical features are the legacy of a language that once named all the land features in this area. A rich heritage of legend, myth and spirituality link the Carrier people to the land.

Today the land base is rich in archaeological sites, reflecting past and present use by aboriginal peoples. Two categories of archaeological resources are evident: archaeological sites containing physical remains of past human activity, and traditional-use sites, which often lack the physical evidence of human-made artifacts or structures, yet retain cultural significance.

The First Nations people of Nad'leh (Nautley), Stella (Stellako), Cheslatta, Sai' Kuz (Stoney Creek), Nakaz'dli, Nazko, Lhoosk'uz (Kluskus), Ulkatcho and Lheit-Li (Fort George) welcomed and guided early explorers like Alexander Mackenzie and Simon Fraser. Alexander Mackenzie, the first European to cross North America, followed aboriginal trails along the Blackwater River on his epic journey to the Pacific Ocean in 1793. The Nuxalk-Carrier Grease Trail (Alexander Mackenzie Voyageur Route) now forms the south boundary of the Plan area.

Simon Fraser traveled up the Nechako and Stuart Rivers in 1806 to found Fort St. James and Fort Fraser, and these Northwest Company (Hudson Bay Company) forts became the focus of the fur-trade era in New Caledonia. The Stuart River, originating near Fort St. James National Historic Park on Stuart Lake, forms the northern boundary of the Vanderhoof LRMP area.

On the west the LRMP area is bounded by the Entiako River - the route of George Dawson' s 1876 Canadian Geological Survey Expedition. To the east, the Collin's Overland Telegraph Line, which proposed to link North America and Russia in 1866 (and which became the Yukon Telegraph in 1902) lies along the eastern boundary of the Vanderhoof LRMP area. This trail route followed in the moccasin tracks of aboriginal trails and became the main access route into the Central Interior for both prospectors heading to the 1870's Omineca gold rush and for early homesteaders in the Nechako Valley.

At the turn of the century, sternwheelers plied the Nechako and Stuart Rivers, while the woods rang with the sound of the tie-hacker's broadaxe. The completion of the Grand Trunk Pacific Railway in 1914 signaled the beginning of major agricultural settlement in the Nechako Valley.

Bush sawmills dotted the forest, as towns like Vanderhoof sprang to life. Pioneer log buildings and historic ranches like Rich Hobson's Rim Rock and River Ranches on the Upper Nechako and Mandalay Creek Ranch on the Stuart River are reminders of the early cattle ranching industry in the Vanderhoof LRMP area.

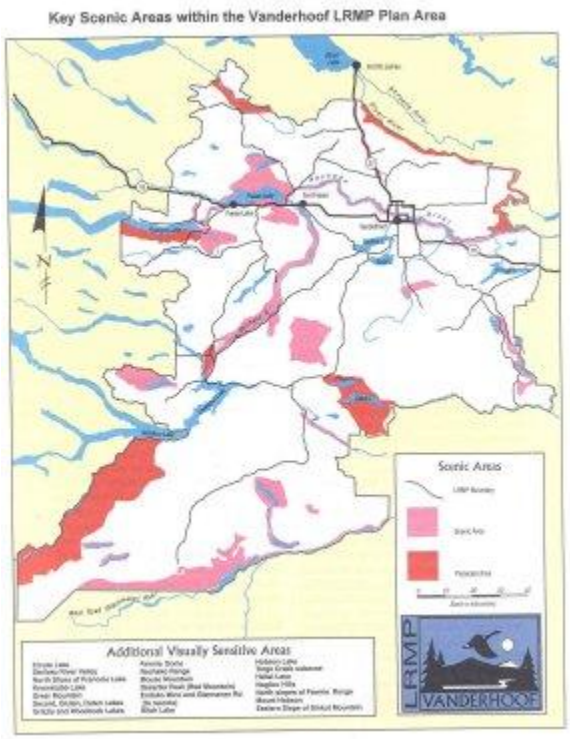
Mennonite settlers logged with horses in the 1940's, and were part of the development of a growing portable sawmill industry that boomed in the 1950's and 60's to form the nucleus of the present-day local sawmill industry.

The Vanderhoof LRMP incorporates cultural, heritage and archaeological values such as historic trails, water routes, pit-house depressions, food cache-pits stone-tool quarry sites, fishing weirs and rock art, and the LRMP endorses the use of pertinent heritage legislation and cooperation and consultation with First Nation groups.

This Plan outlines various strategies for the management of significant historic sites and trails, and recommends continued, ongoing consultation with the public, Archaeology Branch, and organizations such as the Nechako Valley Historical Society, Alexander Mackenzie Voyageur Route Association and the Telegraph Trail Society.

This Plan is consistent with the Heritage Conservation Act, while the British Columbia Archaeological Impact Assessment Guidelines, the Forest Practices Code of BC Act. Archaeological Overview Assessments provide guidance for the incorporation of archaeological and traditional-use sites into operational and local level plans and through investigation, this information may be refined to the 1:50000 or 1:20000 scale, forming further guidance to operational planning.

2.1.7 Recreation & Tourism



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Outdoor recreation is important as a source of relaxation and renewal for area residents and visitors, as well as a source of income for local communities and tourism operators. This increased awareness of tourism has sparked a continually growing level of cooperation with other industries.

To provide opportunities for growth in the tourism industry, the LRMP recommends following the framework provided in the Backcountry Recreation Policy.

Recreation values include road accessed Forest Service recreation sites on lakes and waterways, commercial lodge and recreational facilities, cultural and heritage resources, trails, and backcountry recreation opportunities. One of the key objectives identified through the LRMP process is to maintain a spectrum of recreation opportunities in a variety of settings. Areas managed for particular recreational experiences - varying from wheelchair access to backcountry recreation - will be further deterin med through the implementation of this Plan.

Scenic quality is a major factor in recreational use, and forest landscapes often provide the scenic backdrop so highly valued by the public and the tourism industry.

Central Interior coniferous forests are subject to alteration by fire, windthrow, insect infestations and other natural occurrences, but in today's managed forests, timber harvesting is usually the primary factor causing visible changes on the landscape.

The Vanderhoof LRMP endorses the requirement that visually important areas with recreational significance, or other values, will be managed in a manner that recognizes those values.

A map showing the key Scenic Areas, which will be used to estimate areas with timber supply constraints, has been developed through the Vanderhoof LRMP. These Scenic Areas are a priority for visual landscape planning, a process that should include the local tourism operators. Additional Visually Sensitive Areas will also require non timber supply constraining visual landscape management techniques. These may include Visual Impact Assessments and computer generated visual simulations (digital terrain modeling) from designated viewpoints.

Desired visual quality can be maintained through a variety of management strategies, one of the most widely accepted is the establishment of Visual Quality Objectives (VQOs).

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

Maximum Modification : Maximum modification allows large-scale dominant changes to the forest landscape, with major contrasts in form, color - and texture. Alterations do not conform to the natural topography.

Modification : Modification allows forest management activities to dominate the landscape. In some cases, alterations may borrow from the natural line and form of the topography to ease the visual impacts.

Partial Retention : Partial Retention indicates that forest management activities are noticeable but visually, they blend well with the natural appearance of the landscape. Alterations are subordinate to the dominant landscape features.

Retention : Retention indicates that forest management activities may be discernible but not clearly visible to the average viewer. This would generally be achieved through selection cutting methods or by designing small clear-cuts.

Preservation : Preservation may apply to relatively small areas where landscape values are very high and outweigh other natural resource values. It does not mean that there can be no timber harvesting, but it allows no forest management activities to be visible from designated viewpoints. The direction for visual quality management identified in this LRMP should guide all development (not solely timber interests). Where established, Visual Quality Objectives should be compatible with the management direction for each Resource Management Zone. Additional Scenic Areas may be identified through future integrated resource planning processes, such as LRMP revisions. Additionally, the LRMP recognizes that there may be situations in which circumstances such as forest pest infestations, fires or major windthrow events require reassessment or waiving of visual requirements.

2.1.8 Wildlife

General direction is designed to conserve the wide abundance of all wildlife habitats and populations in the plan area. In addition, specific recommendations have been made to manage for mule deer, moose, grizzly and other at-risk wildlife species.

Mule Deer

To maintain or enhance mule deer populations and habitat:

- Endorse identification and mapping of important mule deer winter ranges, such as south facing slopes with mature Douglas-fir cover
- For Douglas Fir stands providing known mule deer winter range, endorse developing and implementing plans to integrate mule deer habitat requirements. (e.g. implement alternative silviculture systems to maintain uneven-aged stands or other strategies outlined in the Handbook for Timber and Mule Deer Management.)

Moose

The following strategies for maintaining or enhancing moose populations and habitat can be applied to all zones which are NOT being managed for caribou, as the two species have different habitat requirements and conflicting predator-prey relationships. In areas managed for moose habitat, the recommended strategies include:

- Minimize vegetation management (e.g. herbicide, intensive silviculture) in riparian habitat and known winter ranges.
- Endorseproviding an effective forested buffer around all known critical habitats (e.g. licks, seeps, rutting and calving areas).

- Endorse maintaining the amount and distribution of deciduous forest cover found in unmanaged stands within the Riparian Management Zones.

Additional strategies for Special RMZs and appropriate areas of Multi-Value RMZs may include:

- In general, endorse maintaining a distance to cover of less than 200 meters in development areas.
- Endorse avoiding construction of permanent roads in riparian habitats or criticl habitat areas, except where alternate road location results in higher environmental risk/impact or where terrain precludes other road locations.

Grizzly Bear

To maintain or enhance grizzly populations and habitat:

- Endorse identification and mapping of high suitability and capability grizzly habitat.
- In high value grizzly habitat areas, endorse deactivating non-essential secondary roads and minimize the amount and duration of new road access, particularly near critical habitat such as riparian areas, seeps or springs, high elevation burns and subalpine forest.
- Endorse managing for a mosaic of habitat types and characteristics (vegetation types, age class and spatial distribution) in accordance with the Natural Disturbance Type.

Woodland Caribou

Due to the localized nature of Woodland Caribou habitat in this LRMP area, management is focused on the applicable RMZs, in particular, the Entiako Protected Area and the Laidman Lake Multi-Value RMZ.

Species at Risk

To maintain or enhance habitat for additional species at risk (red-endangered /threatened and blue-sensitive/vulnerable), such as bald eagles, trumpeter swans, great blue herons, American bitterns, bull trout and white sturgeon:

- Endorse identifying the location of at-risk species within the plan area.
- Endorse developing management plans to maintain at-risk species which are consistent with this LRMP.

2.1.9 Agriculture & Grazing

There has been tremendous growth in developing agricultural lands in the Nechako Valley over the past 20 years. Key to this expansion were B.C. Lands agricultural lease policies which facilitated the leasing and conversion of more than 20,000 forested ha in the valley to forage and cereal crops, but one-third of the 165,000 ha agricultural land belt is still in the land-clearing and developmental stages. The LRMP is complementary to the Vanderhoof Crown Land Plan, designated Agricultural Development Areas (ADAs) and the Agricultural Land Reserve (ALR).

With the demand for woodlot expansion at the perimeter of arable land in the valley, and the lack of refined arability work on remaining parcels which show promise of agricultural development potential, the possibility for potential land use conflicts is high. LRMP participants representing the Nechako Valley Regional Cattlemen were instrumental in drafting strategies endorsed by all members to minimize conflicts between agricultural expansion and forest or other uses. The following provide general management direction for the Vanderhoof LRMP area, where appropriate and consistent with the intent of each Resource Management Zone (this direction does not apply to the Protected Areas):

- Map arability through field reconnaissance at a scale of 1:20,000 on all areas identified by Nechako Valley Regional Cattlemen's Association before new woodlot and other forest tenures are issued. Utilize this information to recommend Agricultural Development Areas that are compatible with agricultural lease policies.
- Allow existing agricultural operations to expand, providing they qualify under the current agricultural lease policy.
- Defer areas of Provincial Forest that are primarily CLI (Canada Land Inventory) Class 5 arable and other areas identified (as per submitted map) from a Forest Land Reserve until the arability field reconnaissance has been conducted, and the referral parties and the Ministry of Environment, Lands and Parks agree to localized land use. The field work and referrals, which will take place after the LRMP process, are operational or 'finer scale' planning.
- Maintain and consider expanding grazing tenures if required.
- Consider fire as a tool for range and wildlife enhancement where appropriate.
- State of forest development (i.e., silviculture work) not to preclude agricultural lease on appropriat suitable lands
- Identify opportunities for seeding forage species on cutblocks within existing grazing tenures
- Allow for appropriate access to private and agricultural lease lands.

- Prior to the agreement of a localized land use plan, endorse limiting the depth of mechanical site preparations to 15cm on potentially arable lands.
- Consider the potential arability when selecting silvicultural systems prior to agreement of localized land use. After Agricultural Development Areas have been agreed upon, silvicultural systems should consider the arable potential
- Where a conflict has been identified between wildlife, landowners and road maintenance (i.e., beaver) encourage trapping as a management tool.

Additionally, strategies designed to minimize the conflict between agriculture and grazing with other resource uses have been developed in a number of Resource Management Zones. These specific enhancement projects, or mitigative strategies may be beyond what is considered the normal scope of agricultural practices. Funding for these additional strategies may be met in part through the timber appraisal system (where the strategy is associated with timber harvesting) or through Forest Service range program funding. It is expected that some projects may not qualify under existing policies and alternative funding sources may need to be explored.

2.1.10 Minerals and Energy

In general, the LRMP working group sought to optimize the opportunity for the safe, efficient and environmentally sound development and use of the energy and mineral resources for the economic benefit of the planning area and the province. (In this document "mineral" means metallic, industrial mineral, coal, placer, quarry and aggregate resources as defined by the Ministry of Employment and Investment -Energy and Minerals Division.)

Key objectives include:

- Maintain opportunities and access for mineral and energy exploration and development across all resource management zones except Protected Areas and sites excluded under the Mineral Tenures Act (i.e., no-staking reserves).
- Ensure subsurface resource potential and the hidden nature of the resource are carefully considered in lower level planning.
- Respect resource tenure rights, integrating the mineral and energy values with all other values.
- Recognise the hydrocarbon resource potential, associated with the Nechako sedimentary basin.
- Recognise the moderate geothermal potential found in a large portion of the plan area.

Specific strategies to be used across all RMZs (except as noted in Section 2.2) include:

- Endorse promoting and encouraging mineral exploration and development activities through a timely and efficient permitting process.
- Integrate mineral exploration and development activities with other resource users' activities in all RMZs except in Protected Areas, where mineral development will not take place.
- Endorse implementing revisions to standards of practice and the permit process to provide consistency with the Forest Practices Code and other relevant legislation.
- Plan and manage the localized impacts of exploration activities in a manner consistent with the detailed management objectives for each zone.
- For proposed major mine developments, zone objectives will be addressed by the Environmental Assessment Process. For small mine and quarry development, zone objectives will be addressed by the multi-agency regional mine development review process
- Permit road building only when sufficient exploration demonstrates that road access is required for further development.
- Endorse providing for security of tenure in RMZs open to exploration and development.
- Allow for the maintenance of existing access and infrastructure corridors.
- Endorse integrating all resource values into management plans which will upgrade access or provide new access.

2.1.11 Timber Harvesting, Silviculture & Forest Health

The Forest Practices Code forms the baseline for timber harvesting and silviculture across all zones in the Vanderhoof LRMP. The working group, however, has recognized that the Code will look to strategic (LRMP) planning processes for direction and has recommended innovative harvesting and silviculture practiees in an effort to maintain integrated resource use across the entire land base. Most of the practices recommended by the group reflect other resource value maintenance objectives. Silvicultural systems and logging methods not typically associated with the timber types in this area or with current practices (i.e., selection or aggregate harvesting areas) are contemplated in some areas. By necessity these processes will be experimental and need to be evaluated continuously in the years following the LRMP implementation.

General management direction includes:

- To attempt to enhance or maintain a steady wood supply near current harvest levels, the emphasis on non-arable

lands in Resource Development Emphasis zones will be on the timber resource.

- The LRMP recommends allowing for the diversification, of forest tenures by determining the potential for additional woodlots near private land holdings and reserves, and establishing such woodlots as appropriate.
- Management within Multi-Value Emphasis zones will place an equitable emphasis on other appropriate values, integrating the timber resource with other values.
- Forest openings larger than 60 ha, designed as aggregate harvesting areas, will be considered in Resource Development Emphasis and Multi-Value Emphasis zones if managed with characteristics parallel to natural disturbances. Principles for this type of harvesting that are consistent with the Forest Practice Code will be provided as guidance by the Ministry of Forests District Manager during the implementation phase.
- Landscape Unit planning will identify the target levels for seral stage distribution (forest cover and various age classes) over time in Resource Development Emphasis zones. Landscape Unit Plans will form a part of the LRMP implementation phase.
- Timber harvesting and silvicultural practices in Special RMZs or subzones, Sensitive Areas and Forest Ecosystem Networks will be highly modified to meet management objectives for other resources in these areas.
- Tree species considered critical for the maintenance of biodiversity have been identified for further study through this LRMP. This information will aid the Chief Forester when determining appropriate harvesting levels.
- An aspen pulpwood harvesting agreement has been under consideration for a number of years for the Vanderhoof area. The LRMP working group recommends that a comprehensive hardwood (including aspen) harvesting strategy be developed prior to the issuance of such a tenure and used to guide operational level plans.
- Assess the distribution of Douglas-fir as identified in all the zones where it occurs (northern and eastern portions of the LRMP area).
- In key areas (as noted in Section 2.2 -RMZ Direction), access management and the concentrated scheduling of harvesting and silvicultural activities is a critical component in the integration of timber - harvesting with the maintenance of other values, particularly with regard to maintaining a diversity of recreational experience and protecting important wildlife habitat and populations.

- Proactive pest management is recommended for all RMZs, including Protected Areas. Although commercial harvesting (including salvage) in Protected Areas will not be a management tool, pest management is an appropriate method to maintain levels of timber production within Resource Development Emphasis zones and to keep endemic pest populations from becoming epidemic.
- Managing forest health in all Resource Management Zones should continue to utilize the resources and expertise already established in the Ministry of Forests (see also section 2.1.1. Protected Areas)
  Prior to the agreement of a localized land use plan, endorse limiting the depth of mechanical site preparations to 15cm on potentially arable lands.
- Consider the potential arability when selecting silvicultural systems prior to agreement of localized land use. After Agricultural Development Areas have been agreed upon, silvicultural systems should consider the arable potential.

2.1.12 Trapping & Guiding

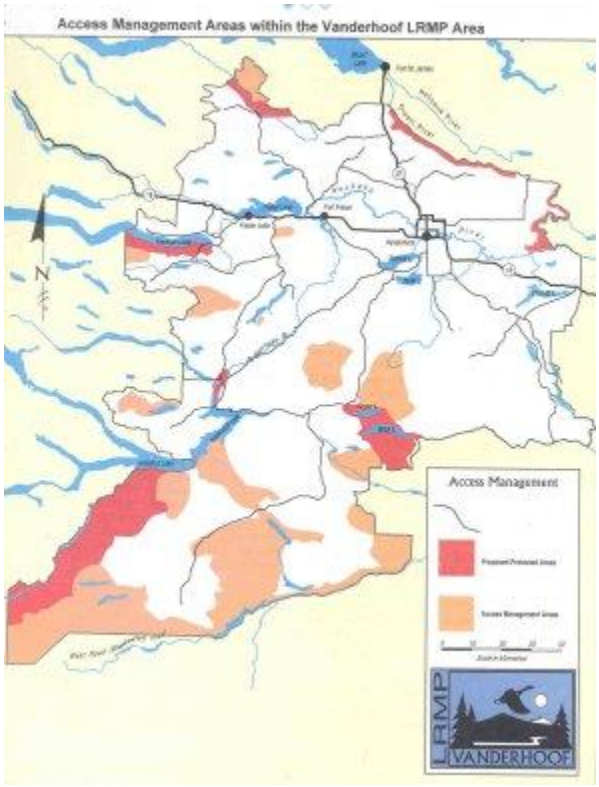
Trapping and guiding is a long-standing tradition in this area, one that the LRMP would like to see continue. To that end, the working group has recommended the following strategies to maintain existing and future opportunities:

- In areas with overstocked regeneration, consider a strategy to avoid thinning a portion (10-20%) of the area and accept it as habitat enhancement.
- Consider harvesting to the water's edge (on up to 25% of selected shorelines) where the objective is to enhance beaver and ungulate habitat and where fisheries and water quality concerns are mitigated. In these situations, deciduous trees may be acceptable regeneration.
- Where available, retain or consider enhancing coarse woody debris to optimize fur-bearer habitat. A suggested area could be 25-50% of the harvested areas within a landscape unit. Future process and study should be undertaken to identify the appropriate amounts and area distribution by Landscape Unit.
- Consider leaving slash piles as small mammal (marten, voles, hares, etc.) habitat where appropriate.
  Work toward stable, longer-term forest development planning to assist trappers and guides to integrate and plan their operations.
- Consider the seral stage habitat required by different fur-bearers and ensure available habitat for healthy

populations of fur-bearers throughout the harvesting rotation.

- Consider designing road allowances to provide crossings for dispersal of marten and other fur-bearing species which typically avoid open areas. Retaining mature timber in various locations on at least one side along a main haul road is preferable. Narrowing the cleared right of way may also be considered where safety is not an issue.
- Evaluate wildlife values found in large burns (200 ha and over) before planning silvicultural activities. Consider a strategy to reduce salvage, thinning, planting and weeding in areas of high-value fur-bearer/wildlife values.
- In areas where it is compatible with the Natural Disturbance Type (NDT) and does not adversely affect critical habitat for rare/endangered species, aggregate harvesting areas may be acceptable where retention, free to grow, stocking standards, coarse woody debris and other attributes are managed to provide habitat.

2.1.13 Access Management



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The generally level to rolling terrain of the Nechako Plateau makes almost all areas of the LRMP suitable for road building and resource development. Licensed and

government authorized resource users have access to all RMZs, except for the prohibition of timber harvesting and mining in Protected Areas. Managing access to provide a variety of recreational experiences and to conserve other resource values is a primary management consideration for the LRMP working group. Access should also consider current policies regarding tourism, recreational lot development, commercial, industrial, agricultural, utility and aquatic resources.

In keeping with the principle that access management should be publicly defensible and used only where public consultation has occurred, the LRMP has developed the following guidelines. This general direction is complemented by more specific management strategies in each zone.

1. The LRMP recognizes that a range of access management will be used as needed.
2. Prior to restricting access, this LRMP endorses undertaking public consultation.
    - Strategic level (LRMP, mine development review or equivalent) and operational level plans (Forest Development, Access Management, and Range Use Plans) are considered to be appropriate public processes through which to make access management recommendations.
    - Where the public will be greatly affected, government agencies shall advertise restrictions and post signs before limiting access on any road or trail.
    - Advertisements and signage shall include the specific reason(s) (i.e.,, resources being protected) for the closure.
    - Where proposed access management is contrary to strategic planning objectives, there must be a public consultation. Consultation is not required where closure is for reasons of public safety or where the closure is required by permit
3. Loop roads are acceptable within the plan area with site-specific limitations.
    - Within each RMZ, wildlife, recreation, and economic values will be considered in making recommendations on whether loop roads should be permitted.
    - Road construction detail shall be dealt with by existing and future regulation.
    - Construction will be managed with consideration for sensitive wildlife values/needs.
    - More detailed access guidelines need to be developed for wildlife, (i.e., protection of marten

corridors, caves, etc.) similar in detail to those already in place for fisheries habitat and water quality protection.

4. Where access is restricted, it will incorporate both a physical closure, if possible, and a posted sign announcing the closure.
    - Gates are not a preferred form of physical access closure.
5. Access management should be used when it is generally agreed that other strategies (e.g. angling restrictions, habitat enhancement, hunting regulations) will not meet resource management objectives.
6. Full rehabilitation (site recontouring, preparation, and vegetation) of block spur roads is generally encouraged in all zones.
7. Where extraction activities are to occur:
    - Existing roads will be used wherever possible and the amount of new road construction will be minimized.
    - Roads will be built and deactivated according to existing and future standards (i.e.,, Forest Practices Code and Mines Act and Mining Right-of-Way Act legislation) to protect other resource value
8. Consider the potential optioh for the Vanderhoof-Anahim connector in the future, with Forest Service Road status. Consider all possible routes through a public planning process.
9. Consider the potential option for the East-West (Bobtail-Kluskus) connector in the future, with Forest Road status. Consider impacts on community stability, timber supply, wildlife values and other values through a public planning process.
10. If endorsed, this connector should manage for habitat attributes by deactivating all secondary roads and retaining a buffer to provide visual screens.
11. The Vanderhoof LRMP recommendations will be used to
12. Management Plan to clearly identify the access status of all roads for both industrial and recreational users. Although it is recognized that access is managed throughout the landbase, the LRMP working group has identified areas where additional access management is endorsed. The following map identifies the location and extent of these areas.

3.0 Social, Environmental and Economic Impact Assessment

The Vanderhoof Land and Resource Management Plan is a successful example of incorporating the results of socio-economic and environmental assessments into the negotiating process and reaching consensus.

This LRMP utilized an informal timber supply analysis which incorporated the Timber Supply Review (TSR), Forest Practices Code (FPC), and recommended Protected Areas (PAS) that met the government's target of 6.8% of the Vanderhoof Forest District landbase (LRMP area).

The Base Case is defined as the "default land use scenario", which would occur in the absence of a formal Land Use Plan. The Base Case is the "benchmark" to which implications of the recommended consensus Land Use Plan are compared. In addition to the TSR and FPC, the Base Case incorporated the recommended Protected Areas which were identified by the Regional Protected Areas Team (RPAT). This LRMP is the first completed plan in BC to incorporate all three initiatives into the Base Case and is justified in that all three initiatives would have been implemented in some form in the District even without a formal Land Use Plan. A "summary matrix" which more explicitly separates Base Case from Plan implications is also included at the end of this section.

The complete assessment is bound under separate cover as Appendix – Socio-economic and Environmental Evaluation of the Vanderhoof LRMP, and this assessment is based on the resource and Geographic Information System area analyses provided by the government's Inter-Agency Planning Team (IPT) for the Vanderhoof LRMP Working Group. The timber supply analysis was undertaken by Industrial Forest Service Ltd. and the socioeconomic and environmental assessments were done by Gary Holman, Consulting Economist, and James Trask of ECL Envirowest Consultants, in cooperation with the Vanderhoof IPT and are available for review upon request.

The quantifiable socio-economic implications of the Base Case and Consensus Plan on existing activities arise from longer term timber supply implications associated with new Protected Areas and the Forest Practices Code. Implications for other sectors are more difficult to quantify and are less significant, because they arise primarily from creating or foregoing potential economic activities and take place over longer periods of time.

The current harvest and Allowable Annual Cut (AAC) apportionment in the Vanderhoof Forest District is 1.7 million cubic meters (m3) annually (1995).

Alternative 1

Using the scenario of maintaining the current level of cut (Alternative 1), the timber supply analysis indicates that cut levels can be maintained for approximately 45–50 years in both the Base Case and in the Consensus Plan. **This indicates that virtually all the timber supply implications result from the Base Case i.e.,,,,, Due to the Forest Practices Code (FPC) and Protected Area Strategy (PAS), they would occur even if there were no Land Use Plan.** After that point in time, the harvest

would then decrease by about 8% per decade, to a level of 1.3 million cubic meters (m3) annually by year 81, before climbing to an annual long term sustainable level of 1.5 million m3 at year 110.

Alternative 2

The Vanderhoof Forest District is one of three Districts that comprise the Prince George Timber Supply Area. Because of this, another harvest flow scenario (Alternative 2) was modeled to illustrate the consequences of a reallocation of some of the harvest from the Prince George Forest District (which is beginning to experience constraints on mature timber availability) to the Vanderhoof District. This scenario indicated that an annual harvest of 1.9 million m3 could be sustained for about 25 years before a reduction of about 10% per decade was conducted in order to reach 1.3 million m3 at year 56, with a final stabilization at 1.5 million m3 at year 110.

It is worth noting that the LRMP Working Group was not comfortable with Alternative 2. This is at least partly due to the Vanderhoof District's three main mills have a combined annual capacity of approximately 2.7 million m3 on a two-shift basis, and they therefore must import or purchase through private sources up to 1 million m3 annually, the long term supply certainty of which is questionable. This overcapacity situation could be exacerbated by new investments in primary breakdown, e.g. a proposed veneer facility for the Vanderhoof area.

Timber (and hence employment) impacts with either Alternative could be deferred for 25 - 50 years, depending on future AAC determinations by the Chief Forester, **i.e.,,,,, no short-term job losses are expected from either the Base Case or the Land Use Plan.** Moreover, during the initial decade of timber supply reductions (occurring sometime between years 25 and 55) no more than 2% of current Vanderhoof Forest District income/employment would be at risk.

It should also be recognized that many factors can intervene to change the nature, or offset the potential employment implications, projected in either Alternative or for the possibility of reduced availability of imported/private fiber. These factors may include the use of previously inoperable timber supplies, improved mill utilization, reservoir log salvage, value-added activities, more labor-intensive harvesting, and initiatives funded by Forest Renewal (FRBC). Additionally, if at some point economic implications are unavoidable, permanent lay-offs can often be avoided through attrition, pension-bridging, or slightly lower average incomes through periodic mill curtailments.

For mining, no existing operations and only a small percentage of tenures, occurrences, and high/medium metallic/industrial mineral potentials are impacted by either the Base Case or the Land Use Plan. In fact, the LRMP can be seen as an improvement over the Base Case for the mining sector, in that it allows for continuing work (until the claims lapse) in the Entiako Protected Area on the Swan, Ent, and Capoose claims, and on the Wolf gold-silver deposit, the latter having the potential of eventually resulting in 40-60 jobs over a 5-10 year period. Outside of the 6.8% of the landbase in Protected Areas, exploration and development for mining continue to be allowable uses.

The LRMP direction also provides for more certainty for farming and ranching communities with the recommendations that potentially arable lands on the perimeter

of the Nechako Valley be inventoried through an intensive arability study, which will help resolve the conflicts between agricultural lease expansion and forestry/woodlot use of these lands. There is little arable land in the Protected Areas, and the LRMP would only place about 0.2% and 2.0% of the ALR in protected and low intensity areas respectively. Any current grazing rights are also grandfathered into new Protected Areas.

There are an increased number of outstanding tourism, recreation, and wilderness opportunities as a result of the six Protected Areas, Special Resource Management Zones and other low intensity development areas. (Note that in terms of the 20 relatively large Resource Management Zones or "RMZs," about 4% of the District would be designated as Special Resource Zones; however, there are additional sub-zones and areas within several of the RMZs that also manage for lower intensity development, such that almost 13% of the land base is to be managed with low intensity objectives.) More specifically, the Consensus Plan places a higher proportion of outstanding and wilderness recreation opportunities, significant recreation features, and fishing lakes in Protected and low intensity areas than does the Base Case. A further benefit results through increased protection of furbearer habitat for hunting and trapping interests.

All of these new areas (e.g. Finger-Tatuk, Francois South) along with their associated management strategies, are likely to attract more tourists, encourage longer stays, and would provide more opportunities for growth in sustainable recreation for residents. Also, the increased level of management for fisheries habitat (e.g. Stuart and Sutherland Rivers, Entiako) and the Plan's access management provisions will better provide for a variety of recreational experiences, including the high quality fishing opportunities on wilderness lakes which many guiding and lodge operations rely upon to attract clients. As a result, new investments in commercial backcountry tourism businesses will also be encouraged.

While First Nations were not involved in the LRMP directly, they were apprised of process and progress extensively throughout the process. No adverse impacts on local aboriginal communities are expected as a result of the LRMP, in fact, the LRMP protects many important aboriginal values (e.g. cultural/heritage, fish/wildlife resources) above and beyond the Base Case due to identification of Resource Management Zones and the development of associated management strategies.

For example:

- the proposals on how forests might be harvested in the southwestern area of the Laidman Zone is akin to forest management principles endorsed by the Ulkatchot'en for their asserted traditional territory in that area.
- The Entiako Protected Areas also provides opportunities for the Ulkatchot'en and manages for several values which hold interest for the First Nations, such as hunting and fishing opportunities as well as historic trails and archaeological sites.
- The Nulki Uplands Subzone, with its high value moose habitat and the Finger-Tatuk Protected Areas (with its

sacred Tatuk Hills, archaeological sites, and high wildlife values) appear to be highly compatible with some of the values expressed by the Sai'Kuz First Nation.

- Intensive First Nations use is apparent from inventoried archaeological sites in the Nechako Canyon area associated with the Sai'Kuz and Cheslatt'en.
- The Ormond-Oona and Shass Mountain (Upper Sutherland RMZ) areas are important to the Nad'leh and Stella First Nations, and will be sensitively managed with respect to aboriginal values.
- The Chief of the Lhoosk'uz has provided support for access management in areas of critical moose habitat in the Davidson Creek RMZ.
- A further benefit is that the proposed Stuart River Protected Area buffers the Chinlac village archaeological site, one of the most significant in the province.

In terms of overall community (including First Nations) stability, the LRMP should enhance economic growth in the District, for many of the reasons discussed above. A more intangible, but possibly holding more significance, is that the Plan provides a higher level of certainty to both resource users and resource managers than would the Base Case. Both groups will now have more comfort around what types of activities are permitted in the various zones, under what rules, and where more special values are managed. All of this direction is important for building business confidence, and the fact that the Plan was agreed to by consensus enhances this evaluation. As a result, despite the longer term possibility of phased-in harvest reductions, it appears that population and economic growth, and the gradual trend to a more service-based economy, should continue.

As for the environmental implications, the incremental changes in resource development intensity and Land and Resource Management Planning on the gross landbase demonstrates a significant improvement. This is largely attributable to new Protected Areas (6.8% of the gross landbase) and the reduction in the proportion of the landbase in resource development emphasis (high intensity) zones; decreasing from 83% to 57% from the Base Case to the Consensus Plan, respectively. Special (low intensity) resource management zones (13% in the Consensus Plan) will also contribute significantly to the maintenance of key environmental values.

In general, the introduction of the Forest Practices Code (FPC) results in improved outlooks for key environmental values within the timber harvesting landbase. Increased reductions in the timber harvesting landbase (estimated at approximately 8.9% for the Vanderhoof Plan area) are associated with riparian reserve zones and wildlife tree patches required to meet FPC requirements. Apart from reductions within the timber harvesting landbase, the 'working forest' constitutes approximately 50% of the gross landbase in the Base Case and Consensus Plan.

Management direction for the maintenance of biodiversity at the landscape and stand levels is provided by the Biodiversity Guidebook (developed for the FPC) and guided by

LRMP defined objectives and strategies (see Section 2.1.3). The recommendations in the Biodiversity Guidebook are largely endorsed by the LRMP and would significantly alter current practices. Some of the major benefits would include:

- A clustered harvesting pattern with aggregated harvest units for some areas, which will leave other large areas of older forest intact and unfragmented for extended periods,
- The retention of forest attributes including coarse wood debris, wildlife trees and deciduous species would maintain critical habitat features, and
- The maintenance of Douglas-fir and tamarack through stand retention, partial cutting and replanting would slow, and potentially reverse the trend in declining amounts.

The Protected Areas Strategy is designed to protect large representative examples of natural diversity (Goal 1 areas) as well as smaller areas with significant special features (Goal 2 areas). The Regional Protected Area Team (RPAT) targeted large, contiguous areas of the region with similar climate and geography (ecosections) and smaller, sub-regional areas that are characterized by particular combinations of plant species (biogeoclimatic subzones/variants) to identify the initial areas of interest. The Consensus Plan modified and refined these areas, providing significant representation for 2 of the 4 ecosections and 5 of 8 biogeoclimatic zones that transect the planning area. The Protected Areas will make a significant contribution towards maintaining natural ecosystems and species assemblages. Areas of interest in adjacent planning areas could expand the Stuart River, Sutherland River, Francois Lake and Entiako Protected Areas and further enhance their viability on a larger scale.

Landscape-level and stand-level retention and linkages are also important in maintaining biodiversity. The application of FPC riparian management zones improves the connectivity over the 1995 Timber Supply Review scenario and the Entiako Protected Areas linking Tweedsmuir Park significantly improves landscape connectivity to the southwest. Special (low intensity) resource management zones and sensitively managed subzones such as the Upper Blackwater RMZ, Laidman Lake Subzones and Chedakuz Subzones in the Consensus Plan further enhance the landscape connectivity within the southwest portion of the LRMP area. The Consensus Plan identifies two forest ecosystem networks and recognizes two wildlife movement corridors within low intensity resource management subzones. Protected Areas, special resource zones, Scenic Areas and leave block concepts identified in the Consensus Plan improve connectivity over the Base Case, in a more disjointed distribution. Landscape-level connectivity is poor in the eastern portion of the planning area in both the Base Case and Consensus Plan, primarily due to the high proportion of resource development emphasis areas.

Old growth forests provide essential habitat attributes for plant and animal species, many of which are generally not available in younger forests. Old growth accounts for 15% of the gross landbase in both the Base Case and Consensus Plan, the majority of which occurs within resource development emphasis zones. The implication is that a greater proportion of young seral forests in these areas would result in sharper habitat

transitions and isolate more patches of old growth within a matrix of young forest types. Riparian reserves, wildlife tree patches and other forested exclusions (inoperable areas, environmentally sensitive areas, etc.) will also contribute to the total amount of old growth, however, many will not contain significant areas of forest interior conditions). Riparian reserves will provide travel corridors for many old growth dependent species. The Consensus Plan is more favorable for old growth management than the Base Case, as it distributes more old growth into protected and low intensity areas.

Several aspects of the Consensus Plan improve the outlook for wildlife habitats over the Base Case.

- The 14% decrease in the proportion of lands (to 57%) in resource development emphasis (high intensity) zones is significant.
- The redistribution (and 3% increase) of special resource management (low intensity) zones capture several important areas for wildlife and increase the viability of adjacent Protected Areas.
- The identified wildlife corridors provide security for wildlife movements.
- Critical wildlife habitats for moose, mule deer and grizzly bear are identified as requiring special management.
- LRMP defined access management areas will benefit woodland caribou, moose and grizzly bear.

Wetlands

Wetlands provide important habitat for a large number of wildlife species including moose, aquatic furbearers, waterfowl, great blue heron and American bittern. Approximately 30% of the identified wetlands occur in special resource zones and Protected Areas. Although wetlands receive some protection through the FPC in the Base Case, the LRMP defined management strategies in the Consensus Plan identify several wetland complexes and riparian habitats as wildlife movement corridors.

Spruce-Cottonwood Habitats

The spruce-cottonwood habitats, which comprise approximately 1% of the LRMP area, receive a disproportionately greater amount of use by a wider range of species than any other habitat type. These habitats occur along the major rivers and function as wildlife movement corridors, provide critical spring and winter range for ungulates, spring and fall habitat for grizzly bear and nesting habitat for bald eagles. Approximately 23% occurs in special resource zones and Protected Areas. Riparian reserve and management zones (FPC), inoperable slopes and environmentally sensitive areas would likely significantly increase the protection of this habitat type.

Grizzly Bear Habitat

A significant proportion of grizzly bear habitat occurs in resource development emphasis areas in the Base Case. These are viewed as high-risk areas to grizzly bears, due to increased road densities and access into remote areas. The Consensus Plan increases the proportion of grizzly habitat in less intensively managed special resource zones and Protected Areas, and correspondingly decreases the proportion in resource development emphasis zones. Lower intensity harvesting subzones adjacent to Protected Areas (Sutherland, and Laidman RMZs) increase the viability as grizzly habitat. LRMP defined access management restrictions in these areas is also favorable.

Species at Risk

A relatively small number of species (11) occurring within the Vanderhoof LRMP area occur on the Conservation Data Center Red and Blue lists; candidates for legal designation as rare or endangered and threatened or vulnerable, respectively. Most of these species are habitat specialists and are found in low numbers and/or are widely distributed on the landscape. The outlook for species that are dependent on riparian habitats, such as the great blue heron and American bittern improves with the application of FPC stream and lakeshore reserves. However, many riparian habitats occur on private land and therefore remain at risk. Overall, there will be benefits from managing more landscape units and key habitat types for high biodiversity compared to the base case.

Woodland Caribou

The Tweedsmuir-Entiako caribou herd (approximately 500 animals) occurs in the southwest portion of the LRMP area. At the time of the recent Timber Supply Review (TSR), the key caribou areas were deferred from harvest but no formal management plan was actively being developed, and correspondingly the risk to the herd was high. The Entiako Protected Area in the Base Case captures the critical habitat areas but the lack of a management plan for timber harvesting in adjacent, lower value caribou habitats does not eliminate the risks. The existing mineral claim areas in the Entiako area of interest were included in the base case and the LRMP defined objectives and strategies which address access and timber harvesting adjacent to the Entiako area of interest, but does not exclude the existing mineral claim areas from the revised area of interest. This strategy would allow the potential mine to continue its operations with the intent that claim areas would be incorporated into the Protected Areas upon their lapse. Without knowing the potential lifespan of mining activity or extent of potential additional exploration and development, there continues to be a risk of impacts to caribou. The comprehensiveness of the LRMP recommendations is a mitigating factor, and improves the outlook for caribou substantially over data assessed by the recent Timber Supply Review.

Fisheries Units

The planning area was subdivided into 18 ‘fisheries units’ to facilitate the assessment of potential impacts to fisheries resources. In general, the introduction of new (proposed) Protected Areas and the Forest Practices Code (FPC) improve the outlook for fisheries values in the Base Case. The Consensus Plan reduces the proportion of the landbase in resource development emphasis zones and provides management strategies and objectives that are specific to maintaining or enhancing fisheries values. This results in

an improved outlook over the Base Case for 7 fisheries units; 10 remain unchanged, and 1 (Stuart) is better protected in the Base Case. (Larger Protected Areas could provide a higher level of protection within the Stuart fisheries unit in the Base Case.) Where the Plan improves the outlook for fisheries values, significantly enhanced protection for fisheries values are provided within 6 fisheries units in the Consensus Plan as compared to 2 in the Base Case. Significant and moderate impacts are largely associated with existing levels of settlement and agriculture, combined with high intensity resource development and a lack of mitigating factors.

As access is provided to more lakes through block roads for timber harvesting, increased fishing pressure on isolated lakes may impact lake resident fish populations, particularly lake trout and bull trout, which are sensitive to angling pressure. Lake classification and lakeshore management direction in the Consensus Plan may result in an increased level of protection (over Regional Lake Classification for the FPC) for some lakes. Since the LRMP has stated that lakes within special resource zones are more suitable for management as refugia (no access, no fishing) lakes, limited/restricted access lakes and quality lakes, there is a greater likelihood that fisheries values will be better protected in the Consensus Plan. In addition, approximately 120 lakes greater than 5 ha in size occur in protected and special resource zones in the Consensus Plan, in contrast to a total of about 80 in the Base Case.

4.0 Implementation, Transition and Monitoring

4.1 Approval of the Vanderhoof LRMP

The intent of the Vanderhoof Land and Resource Management Plan (LRMP) is to provide guidance on the majority of the social and environmental objectives that form the foundation of operational planning. Operational plans provide a description of forest resources and the location, timing and type of forest practices which will manage, use and conserve these resources. Examples of operational plans are Forest Development Plans and Silviculture Plans.

Operational plans must be consistent with the Vanderhoof LRMP after it is approved by government. This means the forest practices described in an operational plan must be tailored to be consistent with the intent of the Vanderhoof Land and Resource Management Plan, and follow the policy guidance within the document, as directed by the District Manager and the Designated Environment Official. While the Vanderhoof LRMP may have objectives that will result in more stringent forest practices than required in the Forest Practices Code of B.C. Act, it does not direct less than the minimum requirements of this code. The Forest Practices Code introduces a number of new forest management and planning approaches and redefines others. Information about the Forest Practices Code of B.C. Act, including guidebooks for forest management can be obtained at any Ministry of Forests or Ministry of Environment Lands and Parks office.

4.2 Relationship between the Vanderhoof Land and Resource Management Plan (LRMP) and the Cariboo Chilcotin Land Use Plan (CCLUP)

The Cariboo Chilcotin Land Use Plan (CCLUP) is a regional plan that was declared a higher level plan under the Forest Practices Code in January 1996. It overlapped the

Vanderhoof LRMP land base following the boundaries of the Upper Blackwater Resource Management Zone. The area of the overlap is referred to as the Upper Blackwater Special Resource Development Zone in the CCLUP, and includes areas of land south of the Vanderhoof LRMP. This overlap will be redefined in order to be administered and managed consistent with the Vanderhoof LRMP. The objectives for this land base in both plans are consistent. Consistency means that the management objectives in the Vanderhoof LRMP that direct on-the-ground activities do not conflict with management objectives in the CCLUP for this specific area. The objectives and strategies in the Vanderhoof LRMP for the Upper Blackwater RMZ are more descriptive and detailed about how resource values will be managed than in the CCLUP. It is recognized that all licensed resource users and the public in that area have been involved in the Vanderhoof LRMP, and resource extraction currently flows to processing facilities in the Nechako Valley. As a result, the Vanderhoof LRMP will guide operational plans during the development of a twenty year total resource plan for this area which will be developed by the end of 1998. That localized longer term operational plan will be a consultative public involvement process.

4.3 Transition

With the depth of consensus agreement supporting this plan, it is already apparent that the management intent is being incorporated into daily resource management activities. To ensure continuity of operational plan activity this LRMP recommends phase-in provisions. These provisions should allow a smooth transition from the operational plans in effect at the time the LRMP is approved, to operational plans which reflect this LRMP.

Licensed resource tenure holders have generally been involved in a substantive way during the development of the Vanderhoof LRMP. They require some time and opportunity to design and institute forest management practices that will ultimately be consistent with the general intent of this plan. Forest management practices in the 1997 forest development plan will recognize and generally be consistent with the objectives of this LRMP. It is recognized though, that existing planning and pre-harvesting planning investments will mean that in some resource management zones, the District Manager may direct timber harvesting and silviculture practices to apply the innovative strategies recommended by this LRMP in the latter years of that Development Plan. Guidance on these recommended forest practices will be forwarded to licensed tenure holders by the District Manager for incorporation of the principles into Forest Development and Silviculture Plans. It is intended that there will be guidance developed on visual management planning requirements, modified harvest (including aggregate harvest areas, selective cutting, and small block design) planning requirements, Douglas-fir and comprehensive hardwood (including Aspen) management strategies. There may be additional guidance developed by the Designated Environment Official from the Ministry of Environment, Lands and Parks.

4.4 LRMP Boundary Formalization

One aspect of the formalization of this Land and Resource Management Plan will be the adjustment of the Vanderhoof and Prince George Forest Districts boundaries in the area south of Tatuk Lake and the Chilako River to reflect current administrative practices and

the LRMP boundary. This Forest District Boundary revision has been endorsed by the Ministry of Forests, Prince George Regional District Manager.

4.5 Resourcing of Special Projects Recommended by the Vanderhoof LRMP

A major arability inventory project on the perimeter of the Nechako Valley is proposed, as required information to minimize and resolve agricultural lease versus woodlot conflicts and determine the most appropriate land use for specific parcels. This inventory should be completed by the end of 1997 to resolve localized land use as recommended in strategies contained in the Recommended Management Direction (Section 2.1.9) of this LRMP. The designation of the Forest Land Reserve in the immediate vicinity of this arability project should be delayed until the arability study has further refined the agricultural/forest land boundaries.

4.6 Implementation and Monitoring

As previously stated, the Vanderhoof LRMP will be implemented through operational plans administered and approved by the resource ministries that participated in the strategic planning process. The term of the LRMP will' be 10 years with a mid-term review in 2001 (year 5), and the major public strategic planning process to renew this documentbeginning in 2004 (year 8). The LRMP participants recommend a combination of annual implementation reporting and independent audits be used to provide feedback to the public and LRMP participants regarding the successes and challenges of putting this plan into action. The reports will require field work and office auditing in addition to personal interviews. They should focus on all levels of management - from silvicultural prescriptions and logging plans, through to development plans and landscape management plans.

Annual meetings will focus on a field trip and reports by the resource agencies on the implementation and monitoring of the LRMP. It will be chaired by the LRMP chair and will note all public comments and requests for minor adjustments to the plan. This material will generally be referenced 'for the eighth year review and renewal of the LRMP process, or a major amendment process, if required. Further direction will be provided by the Resource Management Division~ (RMD) on what constitutes a major amendment to the plan, but it is anticipated that treaty settlements that revise land use patterns, may require such amendments. The meetings would be widely advertised and LRMP participants, resource agency staff and interested public would be encouraged to attend. Biennially in 1998, 2000, 2002, and 2004, an audit of LRMP implementation would be conducted by an independent facilitator/ assessment professional, through telephone and personal interviews with LRMP participants, resource agency staff, resource users and the general public. Review of operational plans would also provide insight into the success of LRMP implementation. The LRMP chair, with the guidance of the inter-agency planning team, would retain an audit professional and this person would report back and present the assessment at the annual meeting. It is anticipated that annual meetings may be held in June unless field trips are more suited to another season to review specific resource management practices.

4.7 Interpretation and Appeal

From time to time, the public or agencies may become concerned about how the plan is being interpreted or about specific land and resource practices that are resulting from it. In all instances of concern, the issues will be dealt with in the same spirit that the plan was developed - cooperative consensus building. Additionally, the chair and facilitators of the LRMP, with the guidance of the Inter-agency Planning team, should be the first avenue for interpretation on the intent of-any section of the LRMP.

Where the public or agencies raise concerns with specific resource management practices that are occurring in the LRMP, they should raise the issue directly with the affected resource agency which is mandated to manage those specific values. Where there is an existing review or appeal process, the concern will be dealt with through that process. For example, concerns over forest road construction will be dealt with under the forest Practices Code.

The objectives and strategies in this LRMP are deliberately strategic, and there will be latitude for interpretation by local agency managers. It is important for all agencies to have a common understanding of the range of interpretation so that licensees receive consistent advice. Where a concern is raised over the interpretation of land use objectives and strategies, the concern should be addressed directly to the affected agency(s). The responsible manager will respond to the concern in writing, consulting with the LRMP chair and Inter-agency Planning Team where necessary. If the matter is not satisfactorily resolved, the concern will be forwarded to the Interagency Management Committee for resolution. The Interagency Management Committee will determine if the decision is consistent with intent of the approved plan. If it is, no further action will be taken. If it is not, the agency responsible will be directed to revise the decision to be consistent with the intent of the plan.

4.8 Vanderhoof LRMP : Interim Landscape Units (solid lines) and Resource Management Zones (dashed lines)

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SOCIOECONOMIC AND ENVIRONMENTAL ASSESSMENT OF BASE CASE AND CONSENSUS LAND USE PLAN April 1996

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Ministry of Employment and Investment

SOCIOECONOMIC AND ENVIRONMENTAL EVALUATION SUMMARY OF THE VANDERHOOF LRMP BASE CASE and CONSENSUS LAND USE PLAN

KEY ACCOUNTS	BASE CASE IMPLICATIONS (INCL, TSR, FPC, PAS)	CONSENSUS PLAN VS. BASE CASE
ECONOMIC DEVELOPMENT SUMMARY	→ 55-85 PYs at risk after yr 25 due to timber supply impacts of FPC/PAS. → Continued slow growth in economy due to tourism, in-migration, retirement incomes, VA wood & First Nations investment. → Gradual decrease in % employed in goods-producing sectors, resulting in modest average income decline.	→ Increased certainty / cooperation created by Consensus Land Use Plan should create more favourable investment climate for timber and non-timber enterprises. → Consensus Plan more supportive of outdoor / wilderness tourism & other nature-based livelihoods. → Otherwise

		similar to Base Case.
SECTOR SUMMARY		
Foresty	➔ 133,000-165,000 m3 harvest decline & 45-70 direct PYs at risk by yrs 25 to 51 due to FPC/PAS. Declines of 8%-10% per decade thereafter. Offset by increased timber utilization, more labour intensive harvesting, intensive silviculture, growth in value-added. ➔ Processing overcapacity problem due to non-renewable licenses &-uncertainty re private supplies / timber imports. New processing proposals would exacerbate problem. ➔ Will continue as dominant industry	➔ Similar to Base Case, i.e. negligible timber supply implications beyond those due to FPC and PAS..
Mining/ Energy	➔ No mining projects proposed but some promising metallic deposits. ➔ Endako mine life of 15 years could be extended if more reserves proven. ➔ Promising Wolf gold / silver deposit precluded	➔ Wolf deposit excluded from Entiako PA and could be developed if feasible subject to environmental assessment process. If mine proceeds, could employ 40-60 for 5-10

	by Entiako RPAT Area. ➔ Mining subject to cycles / trends in world metal prices, but significant job growth unlikely in short term.	years. ➔ Exploration allowed to continue on Swan and Capoose claims in Entiako PA. ➔ Otherwise similar to Base Case.
Agriculture/ Range	➔ FPC / PAS could limit gazing, but still significant underutilized agricultural land and Crown AUM's available for growth in ranching. ➔ Market factors & historical trends suggest moderate growth in ranching.	➔ Less ALR in LI zones than in Base Case. ➔ Less arable land in PAs than in Base Case. ➔ Otherwise similar to Base Case.
Tourism/ Recreation	➔ Continued strong growth fishing lodges / resorts & wilderness viewing operations. PAs will attract visitors. ➔ Longer term high value tourism / guiding may be limited by decline in some environmental values; PAS/FP will preserve some of these values.	➔ Higher % of outstanding / wilderness recreation opportunities, significant recreation features & fishing lakes in PAs & LI zones than Base Case. ➔ Slightly less visually sensitive area in PAs / LI zones, but more in General Management (GM) than Base Case.
Trapping/ Wildcraft	➔ Possible decline in trapping / hunting	➔ Higher % of undeveloped

	due to declines in some wildlife. ➔ Wildcraft potential may be limited without more intensive management.	watersheds in LI / GM & more stringent access restictions will slow decline in wildlife important to trapping / hunting. ➔ Better protection of old growth more supportive of wildcraft potential
COMMUNITY STABILITY / QUALITY OF LIFE	➔ Population likely to continue growing slowly, with some fluctuations due to economic cycles, particularly for wood products & metal ores. ➔ FRBC & gradual diversification of the forestry sector & economy will dampen disruptions. ➔ Resolution of land claims could stimulate economic diversity & development but concerns about impacts on third parties. ➔ New PAs & FPC will better protect fish / wildlife, scenic beauty, & recreation values important to local residents. There will still be some erosion in these values in long	➔ Consensus among key stakeholder groups on Land Use Plan will enhance sense of community cooperation and improve local investment climate. ➔ Consensus Plan somewhat more supportive of fish & wildlife & recreation features & opportunities than the base case, although still some erosion of these values in long term. ➔ Otherwise similar to Base Case.

	term.	
FIRST NATIONS ISSUES	➔ High dependency on social assistance likely until claims settled. Recent timber sale supporting Native-owned reman facility will reduce dependency. ➔ Concerns re impacts of continued timber harvesting on cultural / heritage sites & fish / wildlife resources. ➔ Resolution of land claim will likely provide larger resource base, funding for investment / training, & more input into resource management.	➔ Consensus Plan provides somewhat better protection for cultural / heritage resources & fish & wildlife. ➔ Otherwise similar to Base Case.
GOVT REVENUE		
Local	➔ Slow increase in tax base due to increase in population & economic growth, interrupted by periodic economic downturns. ➔ FRBC could result in region getting greater share of timber revenues.	➔ Consensus Plan somewhat more supportive of tourism component of tax base & would allow development of Wolf deposit ➔ Otherwise similar to Base Case.
Provincial	➔ Possible long term decline in resource revenues due to timber supply losses & higher harvesting	➔ Consensus Plan somewhat more supportive of tourism component of

	costs associated with PAS, FPC, depletion of Endako orebody, land claims settlements. ➔ Increase in revenues from tourism.	tax base & would allow development of Wolf deposit ➔ Otherwise similar to Base Case.
ECONOMIC EFFICIENCY	➔ Environmental, recreational & tourism benefits of Base Case result in higher log costs, longer term harvesting reductions, & would preclude potential benefits of Wolf gold / silver deposit. ➔ Net value of harvest loss estimated at up to $4.50 per BC household / yr.	➔ Consensus Plan would support more tourism benefits & allow benefits of Wolf deposit. ➔ Similar foregone harvest as in Base Case but higher harvesting costs because of more LI & GM zones.
BIODIVIERSITY	➔ protected areas provide significant representation for 4 of 8 subzone variants and 2 of the 4 ecosections ➔ 7.2% of the LRMP area occurs in proposed protected areas ➔ 15% of the timber harvesting landbase meets high biodiversity age class objectives ➔ 15% of the LRMP landbase maintained as old growth ➔ decline in natural biodiversity in the	➔ protected areas provide significant representation for 5 of 8 subzone variants and 2 of the 4 ecosections ➔ 6.8% of the LPNT area occurs in proposed protected areas (reduction to meet Provincial target) ➔ 20% of the timber harvesting landbase meets high

	long-term due to high proportion of forest in young age classes, high road density and habitat fragmentation → landscape connectivity improved over the TSR in western portion by new proposed protected areas	biodiversity age class objectives → 15% of the LRMP landbase maintained as old growth → less risk to biodiversity with less high intensity and favourable LRMP defined objectives and strategies → increase in low intensity RMZ's and LRMP identified FEN's improve landscape connectivity in the western portion over the Base Case
WILDLIFE HABITATS	→ continued declines in deciduous trees and Douglas-fir expected to negatively affect important wildlife habitat → high proportion of high intensity development (83%) expected to degrade quality of many habitat types → outlook for protection of riparian habitats good with FPC vs TSR practices → low elevation spruce-pine habitats at greatest risk → risk of wetland	→ LRMP defined management objectives and strategies to maintain Douglas-fir/deciduous types → less high intensity (69%) provides for improved quality of habitats in the western portion (most high in east) → LRMP increases low intensity areas and define wildlife movement corridors

	habitats becoming isolated with adjacent timber harvesting in high intensity development areas	→ reduced risk for low elevation spruce-pine in western portion → greater proportion of wetlands within low intensity development and FEN's in high intensity development areas
Grizzly Bear	→ 79 % of medium quality grizzly habitat within high intensity development areas → reduced populations expected in long-term with increased fragmentation and access → FPC improves riparian protection, stand management and seral stage distribution requirements → new proposed protected areas provide core habitat areas but the benefits may be limited by isolating effects of adjacent high intensity development areas	→ 60 % of medium quality grizzly habitat within high intensity development areas → reduced populations anticipated in high intensity areas → stable populations in Laidman, Crystal, Sutherland RMZ's with LRMP access management strategies → LRMP designated low intensity development areas adjacent to proposed protected areas increase viable habitat over the Base Case
Moose	→ lack of	→ critical habitats

	comprehensive management for critical winter ranges ➔ wetland habitats expected to become isolated in high intensity RMZ's ➔ reduced populations expected in long-term in high intensity areas due to increased access and vegetation management	(incl. winter ranges) identified as sensitive areas requiring forested buffers ➔ LRMP defined vegetation and access management strategies anticipated to maintain stable numbers and potentially increase in some areas
Marten	➔ 80 % of high quality marten habitat in high intensity development areas ➔ declining populations expected in long-term with increased access, decreased habitat connectivity and decreased mature timber	➔ 63 % of high quality marten habitat within high intensity development areas ➔ population decline to lower carrying capacity expeded ➔ LRMP recommendation for aggregated harvest units (with larger leave areas) may partially mitigate impacts
Species at Risk	➔ Tweesmuir-Entiako caribou at risk due to the lack of a management plan, protected arms would capture a significant proportion of key	➔ decreased risk to caribou with LRMP defined access and timber management recommendations ➔ LRMP access and vegetation

	habitats → grizzly decline in long term associated with altered habitat and increased access → bald eagle, trumpeter swan, great blue heron and American bittern better protected with FPC riparian protection/lakeshore management → slow decline/stabilization at lower numbers for bull trout with FPC → white sturgeon study to develop Provincial management strategy underway	management, and low intensity development RMZs adjacent to proposed protected areas create more viable areas for grizzly → increased protection for bull trout with decreased proportion of land in high intensity development RMZ's
FISHERIES	→ FPC riparian protection and watershed assessments improve outlook for protection over the TSR → Base Case improves the outlook for 16 of 18 fisheries units over TSR → Base Case provides greater protection than the Consensus Plan for fisheries values in 1 fisheries unit (Stuart) → significantly enhanced protection for 2	→ Consensus Plan reduces lands in high intensity development RMZ's by 14% over the Base Case and results in significantly improved outlooks for 6 fisheries units over the Base case → significantly enhanced protection for 6 fisheries units in the Consensus Plan, 2 in the Base Case

	fisheries units in the Base Case, none in the TSR impacts expected in 13 fisheries units in TSR, 7 in the Base Case 80 lakes in proposed PAS and low intensity development RMZ's in the Base Case	continued impacts expected in 6 of 18 fisheries units due to high levels of existing development (settlement, agriculture) and designation as high intensity 120 lakes in proposed PAS and low intensity RMZ's

SOCIOECONOMIC and ENVIRONMENTAL MULTIPLE ACCOUNTS ANALYSIS EVALUATION OF THE BASE CASE and VANDERHOOF LRMP CONSENSUS LAND USE PLAN

1.0 Summary of Socio-Economic Implications For the Vanderhoof LRMP

The quantifiable socio-economic implications of the Base Case and Consensus Land Use Plan on existing activities arise primarily from longer term timber supply impacts associated with new protected areas, and to a lesser extent, from forest management and visual quality designations, that differ from the Base Case. The socio-economic implications for other sectors are more difficult to quantify, and are generally less significant, because they are primarily related to potential, rather than existing economic activity, and take place over longer periods of time. This assessment is based on the resource and Geographic Information System (GIS) analyses provided by Government's Inter-Agency Planning Team (IPT) for the Vanderhoof LRMP Working Group.

Timber supply reductions in the Base Case could place 55 - 85 person-years (PYs) of income or employment at risk, representing about 1.2% - 1.5% of current income in the Vanderhoof Forest District. These impacts could likely be deferred for 25 - 50 years, depending on future AAC determinations by the Chief Forester. Further harvest reductions and employment impacts would occur after that time until long term harvest levels are reached. Despite harvest reductions, population and economic growth and the gradual trend to a more service-based economy will likely continue. The above harvest impacts and trends would be similar in the Consensus Plan, but the higher proportion of Low Intensity / General Management Zones in the plan would be more supportive of wilderness tourism, and other nature-based livelihoods than the Base

Case. Proposed investments in timber processing capacity could exacerbate existing overcapacity and community disruption resulting from future harvest reductions. Table 1 summarizes some key area statistics for selected indicators for the Base Case and Consensus Plans.

TABLE 1
AREA ANALYSIS SUMMARY FOR KEY SOCIO-ECONOMIC INDICATORS

		Base Case				Consensus Plan			
Key Indicators	**Total '000 Ha**	**% Low**	**% GM**	**% High**	**% PA**	**% Low**	**% GM**	**% High**	**% PA**
High Metallic	762.8	11.9	-	81.7	6.4	11.6	12.2	69.1	7.0
Mineral Tenures	77.7	8.8	-	83.9	7.0	11.2	41.2	40.2	7.3
Mineral Occurrences (#)	71	8	-	82	10	6	24	59	8
Outstanding Recreation Opportunities	4.2	48.1	-	45.7	6.3	84.7	0.3	8.8	6.7
Very High Recreation Features	3.6	49.6	-	50.7	5.2	88.0	-	7.7	5.2
Primitive Recreation Opportunities	18.8	-	-	29.4	70.6	9.9	20.4	-	69.7
ALR	142.9	9.3	-	89.8	0.2	1.6	0.1	98.3	0.2
High Visually Sensitive Lands	292.2	36.1	-	55.6	11.7	29.2	9.3	47.7	12.0

2.0 Base Case Land Use Scenario

2.1 Forestry

The Base Case is defined as the land use and resource management regime that could reasonably be expected in the absence of the LRMP, and includes the implications of Provincial land use initiatives such as the Timber Supply Review (TSR) process, Protected Areas Strategy (PAS) and Forest Practices Code (FPC).

The Ministry of Forests recent Timber Supply Review analysis for the Prince George TSA indicated that the estimated long run sustainable harvest level in the Vanderhoof Forest District is higher than the current apportionment and harvest level in the District of about 1.7 million m3. This currently unallocated timber could be used to defer the Base Case impacts of FPC and PAS in the Vanderhoof District for at least 50 years.

On the other hand, the unallocated timber in the Vanderhoof District may be required by Prince George Forest District licencees within the next few years in order to meet their license apportionments (i.e. to maintain harvest levels in the TSA as a whole). The Prince George regional office MOF estimates that this would require an increase in harvest levels to about 1.9 million m3, and would mean that the impacts of the Base Case in the Vanderhoof District could be deferred for up to 25 rather than 50 years.

Two timber supply alternatives are therefore considered for purposes of impact assessment:

1. The assumption that Prince George licensees do not require additional apportionments within the Vanderhoof District (thus permitting longer deferral of harvest reductions due to PAS and FPC), is referred to as Alternative 1. Implicit in this assumption is that any additional timber requirements of Prince George licensees necessary to maintain their apportionments can be met by underutilized timber elsewhere in the TSA.[1]
2. The assumption that Prince George licensees do require additional apportionments in the Vanderhoof District (thus requiring harvest reductions sooner) is referred to as Alternative 2. The impacts on the forestry sector at the Vanderhoof District, Prince George TSA and provincial levels, of Alternatives 1 and 2 are summarized in Tables 2 and 3, respectively.

Alternative 1: Harvest level of 1.7 million m3 for 50 yrs / Without re-allocation

The timber supply analysis undertaken for Alternative 1 by the Ministry of Forests indicates that if the harvest were held at 1.7 million m3/yr., impacts in the Base Case due to the FPC and protected areas proposed by the Regional Protected Areas Team (RPAT)[2] could be deferred approximately 50 years. During the decade following that initial 50-year period, the Base Case could result in timber harvest reductions of approximately 8%, and potentially place at risk 47-55 forestry jobs and up to 15 spin-off jobs.[3] The number of forestry-related jobs potentially placed at risk represent up to 1.5% of total employment and income in the Vanderhoof Forest District.

Harvest levels would continue to decline about 8% per decade until the long run sustained yield (LRSY) of about 1.3 million m3 is reached by year 81. LRSY is about 392,000 m3 less than the current AAC in the Vanderhoof Forest District.[4] Further forestry job losses are possible in the Base Case due to technological change / industry rationalization. Closure of one of the mills in the Vanderhoof Forest District once LRSY is reached (i.e. after 50-80 years), is a possibility in Alternative 1.[5]

Alternative 2: Harvest level of 1.9 million m3 for 25 years / With re-allocation

The timber supply analysis undertaken for Alternative 2 indicates that if the harvest were held at 1.9 million m3/yr., impacts due to the FPC and RPAT's proposed protected areas could be deferred approximately 25 years. During the decade following that initial 25-year period, the harvest would decline approximately 10% and thus the Base Case.could potentially place at risk 58-68 forestry jobs and up to 19 spin-off jobs.[6] The number of forestry-related jobs potentially placed at risk represent up to 1.9% of total employment and income in the Vanderhoof Forest District.

Harvest levels would continue to decline about 10% per decade until the long run sustained yield (LRSY) of about 1.3 million m3 is reached by year 56. LRSY is again about 392,000 m3 less than the current AAC in the Vanderhoof Forest District. A mill closure and the need for industry rationalization could occur sooner in Alternative 2 than in Alternative 1. It is likely that harvest reductions would have to begin immediately in this Alternative in order to avoid reductions below NDY.

TABLE 2*

POTENTIAL FORESTRY SOCIOECONOMIC IMPLICATIONS OF VANDERHOOF LRMP BASE CASE[a]
(ALTERNATIVE 1: 1.7 million m3/yr. for 50 years)

	TSR Impacts	FPC & RPAP PA Impacts	Total
	Potential Timber Supply Impacts ('000 m3/yr)[b]		
Total Impact (0-50 Yrs)	0	0	0
Total Impact (51-60 Yrs)	0	133	133
% Decline Per Decade	~ 8% per decade beginning year 51		
Total Impact Yr 81 (LRSY)	0	392	392
Total Impact Yr 111(NDY)	0	209	209
	Potential Economic Impacts Years 51-60		
VANDERHOOF FOR. DIST			
Jobs at Risk (PYs/yr)			
Direct[c]	0	47-55	47-55

Indirect & Induced	0	8-15	8-15
Total Jobs at Risk	0	55-70	55-70
% of LRMP Jobs[d]	0	1.2%-1.5%	1.2%-1.5%
W&S Impacts ($M/yr)[e]			
Direct, Indirect & Induced	0	1.8%-2.3%	1.8%-2.3%
% of LRMP Income	0	1.2%-1.5%	1.2%-1.5%
PR.GEORGE TSA (Incl.VFD)			
Jobs at Risk (PYs/yr)			
Direct[c]	0	47-55	47-55
Indirect & Induced	0	17-30	17-30
Total Jobs at Risk	0	64-85	64-85
% of TSA Jobs[d]	0	0.1%-0.2%	0.1%-0.2%
W&S Impacts ($M/yr)[e]			
Direct, Indirect & Induced	0	2.0-2.6	2.0-2.6
% of TSA Income	0	0.1%-0.2%	0.1%-0.2%
PROVINCIAL (INCL.PGTSA)[f]			
Jobs at Risk (PYs/yr)			
Direct	0	47-55	47-55
Indirect & Induced	0	34-60	34-60
Total Jobs at Risk	0	81-115	81-115
W&S at Risk ($M/yr)			
Direct, Indirect & Induced	0	2.4-3.2	2.4-3.2

Revenue at Risk ($M/yr)[g]			
BC (Stumpage/CIT/PIT)	0	2.1-4.9	2.1-4.9
Federal (CIT/PIT)	0	0.7-0.9	0.7-0.9
Municipal Revenue	0	0.3	0.3
Net Resource Value[h] ($/yr/BC household Yrs 51-60)	0	$1.50-$3.60/yr	$1.50-$3.60/yr

TABLE 3*

POTENTIAL FORESTRY SOCIOECONOMIC IMPLICATIONS OF VANDERHOOF LRMP BASE CASE[a]
(ALTERNATIVE 2: 1.9 million m3/yr. for 25 years)

	TSR Impacts	**FPC & RPAP PA Impacts**	**Total**
	Potential Timber Supply Impacts ('000 m3/yr)[b]		
Total Impact (0-25 Yrs)	0	0	0
Total Impact (26-35 Yrs)	0	165	165
% Decline Per Decade	~ 10% per decade beginning year 26		
Total Impact Yr 61 (LRSY)	0	392	392
Total Impact Yr 111(NDY)	0	209	209
	Potential Economic Impacts Years 26-35		
VANDERHOOF FOR. DIST			
Jobs at Risk (PYs/yr)			
Direct[c]	0	58-68	58-68

Indirect & Induced	0	10-19	10-19
Total Jobs at Risk	0	68-87	68-87
% of LRMP Jobs[d]	0	1.5%-1.9%	1.5%-1.9%
W&S Impacts ($M/yr)[e]			
Direct, Indirect & Induced	0	2.2-2.8	2.2-2.8
% of LRMP Income	0	1.5%-1.9%	1.5%-1.9%
PR.GEORGE TSA (Incl.VFD)			
Jobs at Risk (PYs/yr)			
Direct Jobs at Risk[c]	0	68-79	68-79
Indirect & Induced	0	11-23	11-23
Total Jobs at Risk	0	79-102	79-102
% of TSA Jobs[d]	0	0.2%	0.2%
W&S Impacts ($M/yr)[e]			
Direct, Indirect & Induced	0	2.6-3.3	2.6-3.3
% of TSA Income	0	0.2%	0.2%
PROVINCIAL (INCL.PGTSA)[f]			
Jobs at Risk (PYs/yr)			
Direct	0	68-79	68-79
Indirect & Induced	0	46-95	46-95
Total Jobs at Risk	0	114-174	114-174
W&S at Risk ($M/yr)			
Direct, Indirect & Induced	0	3.4-4.8	3.4-4.8

Revenue at Risk ($M/yr)[g]			
BC (Stumpage/CIT/PIT)	0	3.3-6.9	3.3-6.9
Federal (CIT/PIT)	0	1.0-1.3	1.0-1.3
Municipal Revenue	0	0.3	0.3
Net Resource Value[h] ($/yr/BC household Yrs 26-35)	0	$1.90-$4.50/yr	$1.90-$4.50/yr

Forest Sector Implications at the Community and Provincial Level

Forestry-related economic implications of the Base Case at the provincial level are also summarized in Tables 2 and 3 for Alternatives 1 and 2, respectively. Impacts at the community level are difficult to predict because of uncertainties about wood flows and worker residence. Harvest impacts would likely be prorated among licencees according to their existing share of the District's total AAC apportioinnent. Since the current pattern of forest worker residence largely reflects the existing Licencee apportionments in the Forest District, it is likely that the employment impacts of the Base Case would be distributed similar to the current residence patterns. This suggests that at least half of the employment impacts of the Base Case would occur in the immediate Vanderhoof area, taking into account the surrounding rural area which is linked to the Vanderhoof economy. However, since about half of the total District workforce resides in Vanderhoof or the surrounding area, the potential Base Case employment impact as a percentage of Vanderhoof area employment would be about the same as for the District (i.e. 1.9%)

Alternative Adjustments To Forestry Impacts in the Base Case

The timber analysis indicates that harvest impacts within the Vanderhoof Forest District can be avoided for at least 25 years. However, shorter term disruptions could occur due to changes in the availability/cost of private/imported timber (on which local processors are highly reliant) and or industry rationalization. However, it should be stressed that in both the shorter term (i.e. less than 25 years) and longer term (i.e. greater than 25 years) any "adjustments" to timber shortfalls (due to reductions in private/imported timber or declining local harvest) could be achieved through attrition or take the form slightly lower average incomes as a result of periodic shutdowns, rather than workers losing their jobs entirely, or they could offset by accessing previously inoperable timber. With respect to the short term specifically, the accessing of reservoir salvage wood, more environmentally sensitive (e.g. selection) harvesting required by the Forest Practices Code, and Forest Renewal BC initiatives could offset possible employment impacts due to either fibre import reductions or industry rationalization.

2.2 Tourism and Recreation

The seven new protected areas proposed by RPAT, particularly those with road access and existing recreation use and facilities (e.g. Nechako Canyon and Finger-Tatuk Lakes), would likely attract and encourage longer stays in the region by tourists, and would protect opportunities for growth in sustainable recreation (e.g. camping and hiking) by residents. Over time, growth in tourism supported by visitors to new PAs could generate employment, but data is not available at this time to estimate this impact. The new PAs would support increased utilization, and may eventually stimulate additional investments in commercial backcountry tourism activities (e.g. resorts, lodges, guiding), although protected area management policies will likely place upper limits on the scale and nature of these investments and activities.

For example, there appears to be approximately 3000-4000 acres of available arable land in favourably-zoned areas (i.e. Settlement/Agriculture and High Intensity) in the Nechako Valley area that could be allocated under B.C. Lands Agricultural Leases in the future, and about 20%-30% of total AUMs in the Vanderhoof Forest District remain uncommitted. [9]

While there could be relocation/development costs (e.g. fencing for riparian areas, new watering structures) of new range areas eventually, the Grazing Enhancement Fund, other Ministry of Agriculture assistance programs, and FRBC could with these costs.

There are concerns about potential liability conflicts on jointly held woodlot / range tenures for silvicultural damage by cattle, but this issue exists regardless of the Land Use Plan per se.

The Base Case would protect or place in Low Intensity / Visual Quality zones [7] about 54% of outstanding recreation opportunities, 28% of opportunities requiring special management and about 55% and 43%, respectively of significant recreation features rated very high and high. About 70% of primitive recreation opportunities will be protected in the Base Case, and about 22% of semi-primitive opportunities (non-motorized) would be in protected areas or Low Intensity / VQO zones. Almost 50% of highly visually sensitive areas in the LRMP would be protected by VQOs and new PAs in the Base Case. Therefore, while there is significant protection in the Base Case, continued timber harvesting in the LRMP area will, in the longer term, erode some of the recreation values and scenic beauty valued by residents and visitors.

2.3 Mining and Energy

RPAT's proposed new protected areas would not affect any existing mines, but would preclude development of the promising Wolf gold-silver deposit in the Entiako PA. If determined to be feasible and this deposit could employ about 40-60 over a 5-10 year period. RPAT PAs would also preclude 5 other known metallic mineral occurrences, 7% of mineral tenures, 6% of high metallic mineral potential, and 7% of medium metallic potential. Another 12% of high and 8% of medium metallic potential would be included in Low Intensity / VQO zones where mining development would have to be sensitive to visual quality concerns and other environmental values.

RPAT PAs would not affect any existing or proposed industrial mineral mines, but would preclude about 3% and 12% of high and medium industrial potential, respectively.

The impact of the Base Case land use plan depends primarily on whether the Wolf deposit would be developed. New PAs may also cause some short term uncertainty and disruption of exploration activity and investor confidence.

BC Hydro has indicated that the Base Case land use plan does not affect any proposed hydro sites or Rights of Way. [8]

2.4 Agriculture

The new riparian areas established under the FPC (on both streams and lakes) would comprise about 9% of the Vanderhoof Forest District and could gradually over time prevent access for cattle grazing, however current grazing rights are grandfathered into the new protected areas. There is very little arable land in the proposed RPAT PAs, with minor exceptions in the Stuart River and even less in the Sutherland River areas. RPAT PAs would affect only about 0.2% of currently unutilized Crown ALR. Given the availability of under-utilized agricultural land and "Animal Unit Months" of forage in the District, it would appear that other opportunities for growth are available.

For example, there appears to be approximately 3000-4000 acres of available arable land in favourably-zoned areas (i.e. Settlement/Agriculture and High Intensity) in the Nechako Valley area that could be allocated under B.C. Lands Agricultural Leases in the future, and about 20%-30% of total AUMs in the Vanderhoof Forest District remain uncommitted.[9]

While there could be relocation/development costs (e.g. fencing for riparian areas, new watering structures) of new range areas eventually, the Grazing Enhancement Fund, other Ministry of Agriculture assistance programs, and FRBC could with these costs.

There are concerns about potential liability conflicts on jointly held woodlot / range tenures for silvicultural damage by cattle, but this issue exists regardless of the Land Use Plan per se.

2.5 Fisheries, Trapping, Guiding, Wildcraft

Although new PAs and the FPC Riparian Guidelines will better protect habitat for fisheries, fur-bearing / big game mammals and botanical forest products, about 83% of the Vanderhoof Forest District would be in High Intensity Zones. Therefore, the risk to salmon habitat will still increase over time as harvesting and road access in salmon-bearing watersheds proceeds. More and more of the freshwater lakes in the District would come under steadily increasing fishing pressure as a result of an expanding network of logging roads. Income from trapping would likely decline as old growth-dependent species (e.g. marten) decline. Big game species such as moose and grizzly will also likely decline in the long term, as the land base in High Intensity Zones became increasingly fragmented. The potential for botanical forest products, particularly mushroom harvesting, would also likely decline with successive logging

passes in High Intensity Zones, although explicit recognition of these values in resource management plans could preserve some of this potential.

2.6 First Nations

First Nations individuals represent about 12% of the population of the Vanderhoof Forest District, approximating 1300 residents, not all of whom live on reserves. The key First Nations in the area are the Sai' Kuz (Stoney Creek), Stellaten (Stellaquo), Nadleh Whut'en (Fraser Lake), and the Cheslatta - most of the latter group live in the Burns Lake District. The Ulkatchot'en Nation in the Chilcotin also claims a traditional territory in the Plan area.

In the Base Case, while local First Nations are becoming more involved in economic ventures such as value-added wood processing, continued high dependence on social assistance is expected at least until land claims are settled. These settlements should provide aboriginals with a larger resource base, cash (primarily federal) settlements, and therefore more control over their economic destinies and resource management decisions. Implications for third parties may have to be addressed, however.

The Base Case, due to current provincial resource management policies, as well as through FPC and PAS, should address some aboriginal concerns regarding cultural/heritage site preservation and protection of fish/wildlife resources. For example, RPAT's Finger-Tatuk, Entiako, and Nechako Valley proposed protected areas all contain preservation values that are important to the area's First Nations.

3.0 Consensus Land Use Plan

3.1 Forestry

The implications of the Consensus Plan on timber supplies and on forestry jobs and income are virtually negligible above and beyond the Base Case.[10] A net increase in Low Intensity Management Zones (less area in VQOs but more area in other types of low intensity designations) and General Management Zones, would still not require a timber harvest reduction any sooner than the 25 years (Alternative 2) indicated in the Base Case. Thereafter, harvest levels would decline by about the same 8%- 10% per decade until LRSY of about 1.3 million m3 is reached by year 81 (Alternative 1) or by year 61 (Alternative 2). Therefore, the Forest District, Prince George TSA, and provincial implications of the Consensus Plan would all be similar to those summarized in Tables 2 and 3 for the Base Case. The distribution of forestry impacts within the District and the long term implications for possible closure of one of the mills in the District would also be similar to the Base Case.

Perhaps one of the most important implications of a Consensus Land Use plan is the sense of certainty (and community cooperation) it should provide, not only for forestry activities, but for other local non-timber (e.g. mining, agriculture, tourism) related investments as well. While intangible these factors are important to business investment choices - for example, certainty as to location and extent of Low Intensity

and protected areas should provide existing or potential tourism operators in or near those areas with a higher level of comfort just as the High Intensity, and General Management, and Settlement/Agriculture designations should provide more assurance for the forestry, mining, and agriculture sectors.

3.2 Tourism and Recreation

The Consensus Plan would place a larger proportion of areas with high recreation potential in protected areas or in Low Intensity /VQO Zones compared to the Base Case- about 91% of outstanding recreation opportunities, 30% of opportunities requiring special management, and 92% and 44%, respectively, of significant recreation features rated very high and high. The Plan also places more of these values, particularly recreation opportunities requiring special management and significant features rated high, in General Management Zones.

The Consensus Plan would provide significantly greater protection for wilderness recreation opportunities. About 80% of primitive recreation opportunities and about 49% of semi- primitive opportunities (non-motorized) would be in protected areas or Low Intensity VQO zones. An additional 20% of primitive and 4% of semi-primitive recreation opportunities would be placed in integrated management. About 43% of high visual sensitivity areas in the Vanderhoof Forest District are protected by VQOs, new Low Intensity zones and PAs in the Consensus Plan. This is somewhat lower than in the base case, because a smaller proportion of visually sensitive areas are placed in VQOs. However, an additional 9% of visually sensitive areas are placed in General Management and less in High Intensity zones (48% in the Consensus Plan versus 56% in the Base Case). The Consensus Plan's more stringent access provisions will also better preserve high quality fishing opportunities on wilderness takes which fishing guide / lodge operations rely upon to attract their clients.

Therefore, there is generally higher protection of recreation values in the Consensus Plan than in the Base Case, and overall, similar protection of visually sensitive areas. However, continued timber harvesting in the Vanderhoof Forest District in the longer term will still erode some of the recreation values and scenic beauty of the District.

The generally higher levels of protection in Consensus Plan for recreation values and features could, in the longer term, potentially generate higher employment in outdoor tourism than in the Base Case. Better protection of these values would encourage greater investment in commercial tourism ventures such as lodges and resorts, and encourage longer stays in the area. The protection of the South Francois Lake, which is readily accessible from Highway 16 and already drawing significant recreation use and related development, is particularly significant from tourism perspective. However, data are unavailable at this time to quantify these impacts.

3.3 Mining and Energy

No existing mines would be precluded by the Consensus Scenario. Although the Entiako PA would still include the Wolf deposit and Swan/Capoose claims, the management guidelines for the Entiako specify that exploration and development of these areas

could continue, subject to existing environmental review mechanisms. The new protected areas in the Consensus Plan would preclude about 7% of high, and 6% of medium metallic mineral potential, roughly similar to the Base Case. Another 12% of high mineral potential and 10%of medium potential would be included in Low Intensity zones. This is a slight increase from the Base Case, but the impacts on actual mineral development are unlikely to be significant. Overall, the Consensus Plan could have a beneficial impact on mining activity, compared to the Base Case since further work on the promising Wolf deposit could continue. The actual impact would depend on whether the Wolf deposit and Swan/Capoose claims actually proceeded to the development stage.

3.4 Agriculture

The Consensus Plan would not have significant incremental impacts on agriculture compared to the Base Case. The Consensus Plan places the same small proportion, only 0.2%, of the ALR in new PAs (same as the Base Case) and reduces the proportion of ALR in Low Intensity zones, from about 9% to less than 2% in the Base Case. In addition, there is somewhat less identified arable land included in protected areas than in the Base Case, due to the reduction in size of RPAT's Stuart River proposal which made way for the creation/expansion in size of the Francois South protected area.

3.5 Fisheries, Trapping, Guiding and Wildcraft

Fish and game guiding, trapping and wildcraft will likely benefit somewhat from the reduction in the Consensus Plan of High Intensity Zones (from about 83% overall to less than 70%) and the increase in Low Intensity and General Management areas, compared to the base case. The Consensus Plan places a greater proportion of old growth (about 36% versus 20% in the Base Case) and undeveloped watersheds (about 97% versus 39% in the Base Case) in PAs, Low Intensity and Integrated Management. In addition, stricter controls on access should reduce harvesting pressure on wilderness lakes and species such as grizzly which are vulnerable to fragmented habitat and human contact.

3.6 First Nations Implications

While First Nations were not involved in the LRMP directly, they were consulted extensively throughout the process. No adverse impacts on local aboriginal communities are expected as a result of the Plan, and in fact the Plan should protect many important aboriginal values (e.g. cultural/heritage, fish/wildlife resources) above and beyond the Base Case due to the new zones and management strategies adopted.

For example, the proposals for how forests might be harvested in the southwestern area of the Laidman Zone is akin to forest management principles endorsed by the Ulkatchot'en for their traditional territory in that area. The proposed Entiako protected area also provides opportunities for the Ulkatchot'en and protects aboriginal hunting, fishing, and lifestyle opportunities as well as historic trails and archaeological sites. The Nulki Uplands Sensitive Area with its high value moose habitat, the proposed Finger-Tatuk protected area (with its sacred Tatuk Hills, archaeological sites, and high wildlife

values) also appear to be highly compatible with some of the values expressed by the Sai'Kuz First Nation.

Intensive First Nations use is apparent from inventoried archaeological sites in the Nechako Canyon area associated with the Sai'Kuz and Chestatt'en. The Ormond-Oona and Shass Mountain (Upper Sutherland RMZ) areas important to the Nadleh Whut'en and Stellat'en First Nations will also be sensitively managed with respect to aboriginal values. The Chief of the L'hoosk'uz has provided support for access management in areas of critical moose habitat in the Davidson Creek RMZ. A further benefit is that the proposed Stuart River protected area buffers the Chinlac village archaeological site, one of the most significant in the province.

4.0 Community and Worker Adjustments, Mitigation / Transition Issues

The (longer term) employment implications estimated in this assessment are characterized as "jobs at risk" because of the uncertainties inherent in forecasting over a 25-50 year period and because estimates are based on the somewhat unrealistic assumption that firms and workers make no adjustments to minimize or avoid impacts. For example, firms might find alternative sawlog supplies, at least in the short term, or lower their labour costs through periodic shutdowns or attrition rather than lay-offs.

This is not to trivialize the difficult adjustments for individual workers (and their families) who are displaced and cannot find alternative employment, . There are a number of measures that could be implemented to mitigate the employment/income implications of industry rationalization and/or land use changes (or reductions in private/imported fibre supplies) in the shorter and longer terms, including greater use of underutilized timber supplies (e.g. previously inoperable, low productivity or deciduous stands), incremental silvicultural activities funded by FRBC, and more labour intensive harvesting and value-added processing. Phasing in timber harvest reductions as indicated by the timber supply analysis also allows time for transition measures, and the beneficial impacts of the Consensus Plan on tourism growth and the investment climate, to take effect.

It has been noted earlier that the timber analysis indicates that the timber impacts of both the Base Case and Consensus Plan can be avoided for at least 25 years. It therefore appears that there is ample time to prepare for potential harvest-related employment implications.[11] However, processing facilities in the Vanderhoof Forest District rely substantially (approximately 1 million m3 per year) on imported and private timber, the long term security of which is uncertain. The small pine resource upon which L & M Lumber depends also has a finite lifespan, estimated at about 20 years in the Prince George Timber Supply Review document. Therefore, existing processors may begin to experience wood supply shortages or cost increases in the near future even if the 1.7 million m3 Vanderhoof AAC apportionment is maintained.

In addition to uncertainty regarding existing, imported timber supplies, there are proposals for new processing facilities (a plywood veneer plant and a pulp mill) that would be partly supported by presently underutilized wood supplies (i.e. deciduous and reservoir log salvage), but which may eventually have to compete for existing supplies. Therefore, if these facilities proceed, an existing processing overcapacity situation would be exacerbated, lowly, regionally and provincially. This issue should be

considered in any current or future community planning initiatives. A transition strategy could be also developed that attempts to "match" workers displaced as a result of timber supply shortages or industry rationalization, with employment opportunities in new value-added facilities or other new projects.

In terms of overall community (including First Nations) stability, the Plan should enhance economic growth in the District, for many of the reasons discussed above. More intangibly, but possibly of more significance, the Plan provides a higher level of certainty to both resource users and resource managers than would the Base Case, as was noted previously. Both groups will now have more comfort around what types of activities are permitted in the various zones, and under what rules, and more special values are protected. All of this is important for business confidence, and the fact that the Plan was agreed to by consensus should enhance the situation. As a result, despite the longer term possibility of phased-in harvest reductions, it appears that population and economic growth, and the gradual trend to a more service-based economy, should continue.

Environmental Analysis

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[1]The AAC established by the Chief Forester for the Prince George TSA as of February 1, 1995, is approximately 300,000 m3 lower than the sustainable harvest level estimated in the Timber Supply Review. This does not take into account possible future supplies from sites currently considered low productivity or inoperable, although there are other offsetting factors which would have to be undertaken in future AAC decisions.

[2] Base Case PAs are assumed to be the Areas of Interest (AOIs) recently identified by the Regional Protected Area Team (RPAT) that would meet Government's PAS target of 6.8% for the Vanderhoof Forest District.

[3] This estimate assumes that harvest reductions due to the Vanderhoof LARP are not prorated among all licensees in the Prince George TSA.

[4] Long Run Sustained Yield (LRSY), representing the long term harvest level on unmanaged stands, is about 1.3 million m3 for Alternatives I and 2. The long term harvest level for managed stands or Non- Declining Yield (NDY) is about 1.49 million m3 for both Alternatives. NDY is reached by year 110 in both Alternatives, and is about 209,000 m3 below the current Vanderhoof District AAC.

[5] Timber supply modelling for Alternative I indicates that earlier harvest rwucfions (i.e. 5% for three five year periods beginning in year 5) would avoid reductions below the NDY, thus reducing the risk of miu closure in the long term.

[6] This estimate also assumes that harvest reductions due to the land use plan are not prorated among all licensees in the Prince George TSA. Prorating would mean that the Vanderhoof Forest District would incur only about 18% of the harvest and employment impacts and the rest of the TSA would incur 82% of these impacts. However, the

Vanderhoof District would also eventually incur a prorated share of harvest reductions due to land use decisions in the other LRMPs in the Prince George TSA.

[7] Those areas with Visual Quality Objectives (VQOs) are the only Low Intensity Management Zones in the Base Case.

[8] Personal communication, BC Hydro.

[9] "Vanderhoof LRMP Socio-Economic and Environmental Base Case", Resource Systems Management International Inc. & ECL Envirowest Consultants Ltd., March, 1995 and Vanderhoof Forest District suff.

[10] Note that the alternative harvest flow which initially constrains the District harvest at 1.7 million m3/yr. indicates that the step-down to LRSY would begin at year 45 in the Plan instead of year 50 in the Base case.

[11] Harvest reductions would have to occur earlier in order to avoid decline in timber harvests below NDY. This would result in more immediate impacts on the local economy but would reduce the risk of mill closure in the longer term.

*** No Separate Table done for Consensus Land Use Plan since timber impacts are essentially negligible above and beyond the Base Case timber impacts.**

Footnotes to Tables 2 & 3:

(a) Base Case impacts are impacts attributable to Provincial PAS and FPC initiatives. FPC estimated as riparian and wildlife tree retention. Incremental impacts are impacts of the LPDMP that are incremental to the Base Case. ”LRSY" is the long run sustained yield for unmanaged stands. “NDY" is non-declining yield for managed stands.

(b) Harvest impacts estimated with timber supply model developed by Industrial Forest Service Ltd in consultation with MoF PG Region. Short term losses determined primarily by mature timber withdrawals and long term losses by productivity on affected forest lands. Current Vanderhoof harvest apportionment on Crown land is 1.7 million m3/yr.

c) Direct jobs at risk in Vanderhoof based on 1993 resident employment per'000m3 harvested in logging of .15-. 18 PY/'OOOm3 (incl. log hauling / road building, with & without silviculture) and in milling of .20-.23PY/'OOOm3 of throughput (excl. Isle Pierre millworkers, with and without value added). 1993 private sector forestry resident employees in Vanderhoof F.D. (excl. Isle Pierre) estimated at 1,240. Direct jobs in Prince George TSA based on same PY coefficients as for Vanderhoof District, except for processing in Alternative 2, which assumes a weighted average of coefficients for Vanderhoof (incl. Isle Pierre) and Prince George Districts (.26-.30 PYPOOOm3). 1993

forestry employees in Prince George TSA estimated at 7,838. (Source: Prince George TSR Socio-Economic Analysis)

d) Indirect and induced impacts for Vanderhoof F.D. derived with economic base employment multipliers (i.e. total direct, indirect and induced employment divided by direct employment) of 1.20 - 1.27 for logging and 1. 16 - 1.30 for processing. Total employment in Vanderhoof F.D. estimated at 4,556 in 1991. Indirect and induced impacts for Prince George TSA derived with economic base multipliers of 1.43 - 1.61 for logging and 1.33 - 1.51 for processing. Total employment in the Prince George TSA estimated at 44,991 in 1991. Range of multipliers reflects assumptions about social safety net and worker migration. (Sources: 1991 Ministry of Finance economic base multipliers and economic dependency analysis, adjusted by MEI)

e) Average after tax W&S for forestry sector estimated at $35,000/PY. Indirect and induced income impacts in the region based on average after tax W&S in these sectors of $21,700/PY. (Source: TSR Socio-Economic Analysis). Total employment and non-employment income after taxes in the Vanderhoof F.D. and in Prince George TSA estimated at S 147 million and S 1,490 million, respectively, in 1993. (Source: Based on Ministry of Finance economic dependency analysis)

f) Based on employment multipliers of 1.65 - 2.02 for logging and 1.70 - 2.30 for processing (excl. pulp and paper). (Source: High multiplier based on Ministry of Finance BC Input-Output Model, low multiplier based on BCIOM adjusted for social safety net). Indirect and induced income impacts in the province based on average after tax W&S in these sectors of $21,700/PY. (Source: TSR Socio-Economic Analysis)

g) Potential B.C. revenue impacts include: Stumpage, royalties and rents ranging from $15.78/m3 (without FRBC, average for calendar years 1990-94) to $37. 18/m3 (with FRBC, 1995); logging, corporate income and other taxes of $1.60/W-average for 1990-94); personal income tax revenue losses (based on average PIT rates, as proportion of cash benefits, of 29% for forestry and 20% for indirect sectors, and B.C. share of 33%). Federal revenue losses include federal share of CIT ($1.17/m3) and 67% of PIT. Range of PIT estimates reflects low / high multiplier range. Revenue estimates exclude BC and federal revenues that do not vary with output, and other government costs that may be associated with land use changes (e.g. management costs and income support payments), as well as possible compensation costs for lost timber rights. Municipal revenue losses ($ 1. 99/m3) only if mill closure occurs. (Sources: MOF Valuation Branch and Price Waterhouse, with exception of indirect PIT rate from B.C. Economic Accounts.

h) Stumpage revenue impact per household, based an estimated 1.373 million households in BC in 1994. (Source: Statistics Canada). This indicator is a rough proxy of the opportunity cost of timber resources, i.e. the additional annual amount each household in BC would have to be willing to pay (in years 51-60 for Alternative I and years 26-35 for Alternative 2) to achieve the environmental and other non-timber benefits associated with the Base Case. There would be additional opportunity costs associated with further harvest declines to long term levels.

ENVIRONMENTAL RESOURCE ANALYSIS

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Multiple Accounts Analysis Summary Table - Environment

KEY ACCOUNTS	BASE CASE TRENDS (INCL.TSR, FPC, RPAT)	CONSENSUS PLAN VS BASE CASE
BIODIVERSITY	→ protected areas provide significant representation for 4 of 8 subzone	→ protected areas provide significant representation for 5 of 8 subzone

	variants and 2 of the 4 ecosections - 7.2% of the LRMP area occurs in proposed protected areas - 15% of the timber harvesting landbase meets high biodiversity age class objectives - 15% of the LRMP landbase maintained as old growth - decline in natural biodiversity in the long- term due to high proportion of forest in young age classes, high road density and habitat fragmentation - landscape connectivity improved over the TSR in western portion by new proposed protected areas	variants and 2 of the 4 ecosections - 6.8% of the LRMP area occurs in proposed protected areas (reduction to meet Provincial target) - 20% of the timber harvesting landbase meets high biodiversity age class objectives - 15% of the LRMP landbase maintained as old growth - less risk to biodiversity with less high intensity and favourable LRMP defined objectives and strategies - increase in low intensity RMZ's and LRMP identified FEN's improve landscape connectivity in the western portion over the Base Case
WILDLIFE HABITATS	- continued declines in deciduous trees and Douglas-fir expected to negatively affect important wildlife habitat - high proportion of high intensity development (83%) expected to degrade quality of many habitat types - outlook for protection of riparian habitats good with FPC vs TSR practices - low elevation spruce-pine habitats	- LRMP defined management objectives and strategies to maintain Douglas-fir/deciduous types - less high intensity (69%) provides for improved quality of habitats in the western portion (most high in east) - LRMP increases low intensity areas and define wildlife movement corridors - reduced risk for low elevation spruce-

	at greatest risk - risk of wetland habitats becoming isolated with adjacent timber harvesting in high intensity development areas	pine in western portion - greater proportion of wetlands within low intensity development and FEN's in high intensity development areas
Grizzly Bear	- 79 % of medium quality grizzly habitat within high intensity development areas reduced populations expected in long-term with increased fragmentation and access - FPC improves riparian protection, stand management and seral stage distribution requirements - new proposed protected areas provide core habitat areas but the benefits may be limited by isolating effects of adjacent high intensity development areas	- 60 % of medium quality grizzly habitat within high intensity development areas - reduced populations anticipated in high intensity areas - stable populations in Laidman. Crystal, Sutherland RMZ's with LRMP access management strategies - LPMP designated low intensity development areas adjacent to proposed protected areas increase viable habitat over the Base Case
Moose	- lack of comprehensive management for critical winter ranges - wetland habitats expected to become isolated in high intensity RMZ's - reduced populations expected in long-term in high intensity areas due to increased access and vegetation	- critical habitats (incl. winter ranges) identified as sensitive areas requiring forested buffers - LRMP defined vegetation and access management strategies anticipated to maintain stable numbers and potentially increase in some areas

	management	
Marten	➔ 80 % of high quality marten habitat within high intensity development areas ➔ declining populations expected in long-term with increased access, decreased habitat connectivity and decreased mature timber	➔ 63 % of high quality marten habitat in high intensity development areas ➔ population decline to lower carrying capacity expected ➔ LRMP recommendation for aggregated harvest units (with larger leave areas) may partially mitigate impacts
Species at Risk	➔ Tweedsmuir-Entiako caribou at risk due to the lack of a management plan, proposed protected areas would capture a significant proportion of key habitats ➔ grizzly decline in long term associated with altered habitat and increased access ➔ bald eagle, trumpeter swan, great blue heron and American bittern better protected with FPC riparian protection and lakeshore management ➔ slow decline and stabilization at lower numbers for bull trout with FPC ➔ white sturgeon study to develop Provincial management strategy underway	➔ decreased risk to caribou with LRMP defined access and timber management recommendations ➔ LRMP access and vegetation management, and low intensity development RMZ's adjacent to proposed protected areas create more viable areas for grizzly ➔ increased protection for bull trout with decreased proportion of land in high intensity development RMZ's
FISHERIES	➔ FPC riparian protection and watershed	➔ 14% reduction in lands in high intensity

	assessments improve outlook for protection over the TSR - Base Case improves the outlook in 16 of 18 fisheries units over the TSR - Base Case provides greater protection than the Consensus Plan for fisheries values in 1 fisheries unit (Stuart) - significantly enhanced protection for 2 fisheries units in the Base Case, none in the TSR - impacts expected in 13 fisheries units in the TSR and 7 in the Base Case - 80 lakes in proposed protected areas and low intensity development RMZ's in the Base Case	development RMZ's results in significantly improved outlooks for 6 fisheries units over the Base Case - significantly enhanced protection for 6 fisheries units in the Consensus Plan, 2 in the Base Case - continued impacts expected 6 of 18 fisheries units due to high levels of existing development (settlement, agriculture, road density) and designation as high intensity RMZ's - 120 lakes in proposed protected areas and low intensity development RMZ's - Consensus Plan access management areas regulate fishing pressure

1.0 INTRODUCTION

The purpose of this resource analysis is to provide table members with an assessment of the environmental consequences associated with the proposed land use plan. The analysis presented here summarizes the incremental changes in key environmental values that would result from the implementation of the proposed land use plan in contrast to the base case. The base case provides a benchmark by which the Consensus Plan can be compared and assumes a continuance of current management practices. Current management includes the Forest Practices Code (FPC) and areas of interest identified by the Regional Protected Area Team for the Provincial Protected Areas Strategy (PAS). Where possible, the base case presents area statistics for the January 1995, Timber Supply Review (TSR) separately from the FPC and PAS, which occurred later in time.

2.0 INDICATORS, MEASURES, METHODS AND ASSUMPTIONS

A range of indicators were selected in order to demonstrate the effects of the consensus land use plan on environmental values (i.e. fish, wildlife, biodiversity, etc.) and to determine if desired future conditions for environmental values are likely to be achieved. The indicators, measures and assessment methods were selected based on the quality and availability of information. The indicators chosen for this resource analysis are primarily habitat based and are consistent with those identified during a resource analysis indicator workshop held by the Ministry of Environment Lands and Parks in March, 1995.

The indicators used to compare the effects of the TSR, Base Case and Consensus Plan on environmental values include area statistics, LRMP defined management strategies, and professional judgement. The percentage of land occurring within each resource development intensity is frequently used as the primary measure for evaluating general biodiversity and species status. Management Objectives and Strategies outlined by the LRMP, including general and more specific landscape prescriptions were used where appropriate. Professional judgement was used to assess the significance of the impacts based on the results of the indicator area statistics and management strategies.

Landscape and stand level management recommendations outlined in the FPC Biodiversity Guidebook (1995) provide the framework for managing biodiversity according to natural disturbance types (NDT). Five NDT's and three biodiversity emphasis options are identified and described in the guidebook. The management recommendations for each NDT are modelled to approximate the natural disturbance patterns within biogeoclimatic subzones and subzone variants. For the purposes of analysis, the three biodiversity emphasis options (high, medium and low) were assumed to equate to three resource development intensity designations; Low, General and High, respectively. The Settlement/Agriculture designations are not managed to meet the requirements of the FPC, however, they were considered as Low Biodiversity Emphasis areas. The minimum percentage of mature and old forest and the maximum percentage of early seral forests that are required to meet each biodiversity emphasis option, were used to determine seral stage distribution. In addition, it is assumed that the recommendations for retention of rare biogeoclimatic site series units, natch sizes, landscape connectivity, stand structure and species composition would be followed relative to each biodiversity emphasis option and NDT.

To support the analyses and conclusions, it is necessary to make clear statements about the assumptions used. Throughout this analysis, the indicators, measures, methods and assumptions are presented within the appropriate sections. A number of key assumptions apply to the analysis in general, including the following:

- by managing habitats to meet a specific set of objectives, we are managing for particular subsets of flora and fauna
- mimicking patterns and processes of natural disturbance in managed forests promotes the maintenance of natural biodiversity
- lower intensity development RMZ's (=high biodiversity emphasis) provide more options and opportunities for maintaining native species and ecological processes

- the greater the amount of each biogeoclimatic subzone in protected and low intensity resource management zone (RMZ), the greater the probability that most native species and ecological processes will be maintained

It is important to recognize that our ability to predict the status of wildlife populations into the future is limited. Understanding the functional relationships between habitat (availability, suitability, juxtaposition and structure) and population dynamics is highly complex and typically limits predictive techniques to surrogate measures where empirical data is difficult to collect and interpret. In addition, there is no clear indication of how particular habitats within a landscape unit will be distributed. The application of Geographic Information Systems will be an important tool in modelling habitat availability and suitability as forest management strategies evolve and will improve the predictive abilities of resource managers.

3.0 LANDSCAPE LEVEL OVERVIEW

The incremental changes in resource use intensity and Land and Resource Management Planning in the gross landbase demonstrate a significant improvement in the outlook for key environmental values (Table 1). This is largely attributable to the addition of new protected areas; increasing from 0.02% to 6.8% of the gross landbase.

Low intensity Resource Management Zones (RMZ) will also contribute significantly to the maintenance of key environmental values. The areas of low intensity resource development in the TSR are limited to areas with restrictive Visual Quality Objectives (VQO's) and the Chedakuz Riparian Plan area, which comprise 11% of the gross landbase. A proportion of the VQO's identified in the TSR fall within proposed protected areas in the Base Case, decreasing the amount of low intensity to 10% in the Base Case. Low intensity areas comprise 13% of the gross landbase in the Consensus Plan and include VQO areas outside of proposed protected areas, the Chedakuz Riparian Plan area and newly designated areas within the timber harvesting landbase with special management emphasis. Correspondingly, the incremental change in high intensity resource development areas decreases from 89% to 83% and 69% from the TSR to the Base Case and Consensus Plan, respectively (a 20% reduction from the TSR).

Table 1.	**Land Use Designations Within the Vanderhoof LRMP Area in hectares (% of total land base)**		
	TSR	Base Case	**Consensus Plan**
Protected Areas	873 (0.07%)	95,868 (6.9%)*	**93,956 (6.8%)**
Low Intensity	152,960 (11%)	136,011 (10%)	**177,098 (13%)**
General Intensity	0	0	**161,382 (12%)**

High Intensity	1,229,674 (89%)	1,383,507 (83%)	**951,071 (69%)**
Total	1,383,507	1,383,507	**1,383,507**

* The RPAT area exceeds the Provincial target by approximately 2,000 ha

In general, improved outlooks for key environmental values within the timber harvesting landbase are associated with the introduction of the FPC. Apart from reductions within the timber harvesting landbase, the 'working forest' consitutes approximately 50% of the gross landbase in the Base Case and Consensus Plan (Table 2). The working forest is subject to the FPC requirements and is where resource development intensity designations have the greatest potential to affect biodiversity as they equate to a particular level of biodiversity emphasis in the Biodiversity Guidebook.

Increased reductions in the timber harvesting landbase in the Base Case and Consensus Plan are associated with riparian reserve zones and wildlife tree patches to meet FPC requirements (which have been estimated at approximately 8.9%), as well as proposed protected areas.

Table 2.	**Gross Landbase and Reductions to the Timber Harvesting Landbase in hectares (% of total landbase) - Vanderhoof Forest District**		
	TSR	**Base Case**	**Consensus Plan**
Private Land	165,434 (12%)	165,434 (12%)	**165,434 (12%)**
Non-forest Land	142,396 (10%)	142,396 (10%)	**142,396 (10%)**
Reductions in the Timber Harvesting Landbase	261,852 (19%)	376,930 (28%)	**376,930 (28%)**
Remaining Timber Harvesting Landbase	804,464 (59%)	689,386 (50%)	**692,015 (50%)**
Total**	1374146	1374146	**1,374,146**

** the difference in total landbase in table 2 is due to the lack of data for the area south of Tatuk Lake

Areas of private land comprise a significant proportion of the landbase, the vast majority of which comprises the Nechako Valley RMZ, which is a highly modified landscape where impacts to fish and wildlife values are significant. The non-forest lands include areas that are not capable of growing productive forest (i.e. wetlands, lakes, rock). The reductions within the timber harvesting landbase occur in a wide range of categories including forested and non-forested exclusions. Polygons of each exclusion category are recorded separately in the timber inventory database and there is significant overlap in many (i.e. inoperable and environmentally sensitive areas), which make it difficult to extract meaningful areal estimates.

4.0 BIOLOGICAL DIVERSITY

The assessment of potential impacts to natural biodiversity in the Base Case and as a result of the Consensus Plan is considered at the landscape and stand levels. At the landscape level, the relative proportion of ecosystems occurring in protected and high biodiversity emphasis areas demonstrates the incremental differences in scenarios. An evaluation of the potential impacts to biodiversity at the stand level is more subjective as and is based on the interpretation of future outcomes as a result of current operating standards and LRMP defined Management Objectives and Strategies.

The Biodiversity Guidebook (1995), developed for the FPC, provides the framework for the interpretation of potential impacts to biodiversity at the landscape and stand levels. The underlying assumption of the Biodiversity Guidebook is "all native species and ecological processes are more likely to be maintained if managed forests are made to resemble those forests created by the activities of natural disturbance agents such as fire, wind, insects and disease". Biodiversity objectives are described within the Biodiversity Guidebook for the five natural disturbance types (NDT's) occurring within the Province. Three NDT's occur within the Vanderhoof LRMP area (Table 3).

Table 3. Natural Disturbance Types within the Vanderhoof LRMP Area

Type	Definition	Hectares (% of LRMP)	Subzones/Variants
NDT 1	ecosystems with rare stand-initiating events	527 (<0.1%)	ESSFwv
NDT 2	ecosystems with rare stand-initiating events	161,207 (12%)	ESSFmv1
NDT 3	ecosystems with rare stand-initiating events	1,201,077 (88%)	SKSdk, SBSdw2, SBSmc2, SBSmc3, SBPSdc, SBPSmc

The NDT 3 occurs throughout the lower elevation areas and the NDT 1 and NDT 2 occur in the Engelmann Spruce-Subalpine Fir (ESSF) subzones at higher elevations. The implications of the large proportion of NDT 3 for forest management are largely associated with the cutting pattern, seral stage, patch size distribution and landscape connectivity. Some of the main recommendations in the Biodiversity Guidebook for NDT 3, that are sanctioned by the LRMP include:

- a clustered harvest pattern with aggregated harvest units
- retention of patches of mature timber within aggregated harvest units
- seral stages should occur in a variety of patch sizes within a landscape unit and follow a distribution appropriate for the NDT
- management for even-aged stands
- retain forest attributes including coarse woody debris, wildlife trees and deciduous species
- partial cutting systems for Douglas-fir and larch stands
- provide landscape connectivity along riparian corridors

The existing pattern of harvest is largely dispersed medium-sized cutblocks and leave areas, which, when projected into the future without the application of the FPC (i.e. TSR), would result in a highly fragmented landscape. One of the benefits of aggregated harvest units would be that other large areas of older forest would be left intact and unfragmented for extended periods. This strategy could be implemented in the short term with some benefits but the greatest benefits would occur over the long term as larger, contiguous areas of even-aged forests evolve.

The LRMP defined strategies for maintaining stand structural attributes and species composition are consistent with, and in many areas, more extensive than the recommendations of the Biodiversity Guidebook. The Consensus Plan provides for the greatest level of biodiversity.

Forested exclusions represent 18% of the land base in the TSR, and approximately 27% in the Base Case and Consensus Plan (Figure 1). Apart from new protected areas, the increase in forest exclusions in the Base Case and Consensus Plan are associated with riparian reserve zones and wildlife tree patches, which will contribute to biodiversity. Other forest exclusions that will contribute to biodiversity include non-commercial brush, inoperable areas, environmentally sensitive areas (ESA's), problem forest types and low productivity forest types. It should be recognized that the ability for many of the forest exclusions to function as "default" protection areas is dependent on their size and spatial distribution.

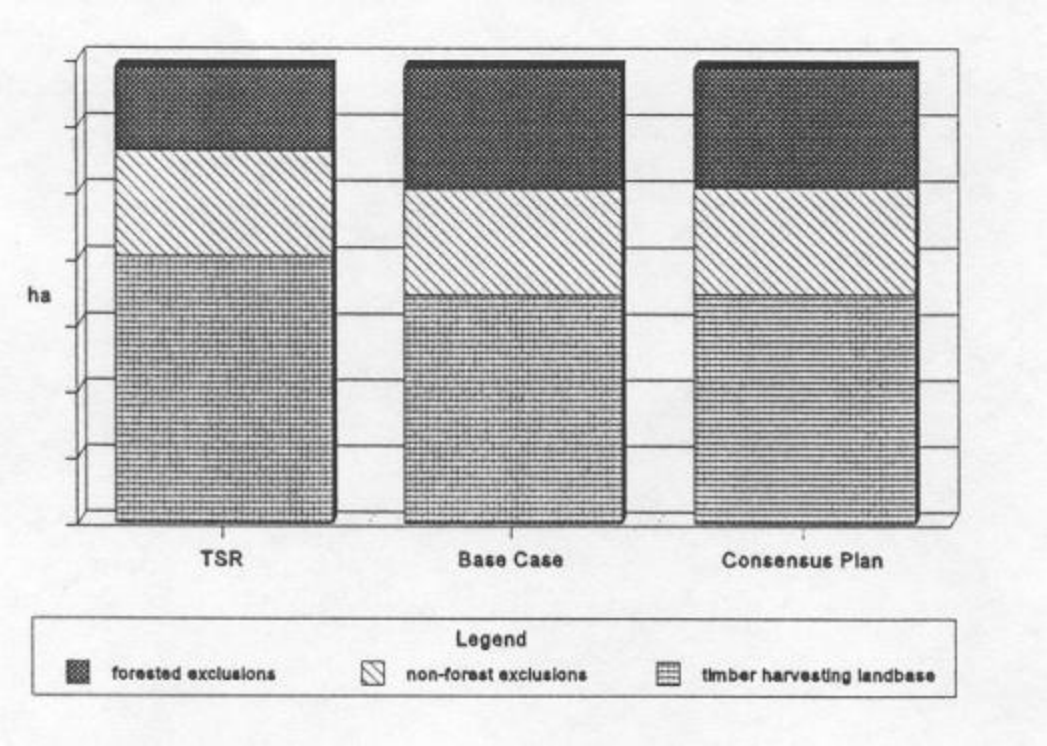

Figure 1. Timber Harvesting Landbase and Exclusions

The proportion of non-forested exclusions remains constant in all scenarios at 23% of the gross landbase. Although the types of non-forest exclusions include private land and roads, other types including wetlands and lake surfaces have a more direct contribution to natural biodivetsity. The proportion and distribution of each type was not available for this analysis but should be considered secondarily to portions of the landbase that are subject to change (i.e. the working forest).

4.1 Protected Area Strategy

The Protected Area Strategy (PAS) is designed to protect large representative examples of natural diversity (Goal 1 areas) as well as smaller areas with significant special features (Goal 2 areas). The proposed protected areas in the base case include 5 areas, which increase protected areas from 0.02% (TSR) to 6.9% of the planning area (Table 4). The Consensus Plan excludes the Dry William Lake Goal 2 area, adds the Francois South (Goal 1) and Nechako Canyon (Goal 2) areas and modifies the protected area proposals to decrease the total protected area to meet the 6.8% Provincial target.

Table 4. Proposed Protected Area Summary

Area of Interest	Base Case	Consensus	Key Subzones

Stuart River	15,641	7,739	SBSdw3
Sutherland River	4,752	4,738	SBSdk, SBSmc2
Francois South	0	6,870	SBSdk, SBSmc2
Nechako Canyon	0	1,299	SBSdk
Finger-Tatuk	18,928	17,376	SBSmc3, ESSFmv1
Entiako	54,924	55,061	SBPSmc, SBSmc3, ESSFmv1
Dry William	750	0	SBSdk
Total	94,995	93,083	

In general, the proposed protected areas would make a significant contribution towards maintaining natural ecosystems and species assemblages. Areas of interest in adjacent planning areas could expand the Stuart River, Sutherland River, Francois Lake and Entiako areas and further enhance their viability. The Entiako proposed protected area would link Tweedsmuir Park and indirectly, the Itchas Ilgachuz proposed protected area (Cariboo , CORE), significantly increasing ecosystem viability. The linear nature of the proposed Stuart River protected area makes it less insular and more susceptible to influences of adjacent land use activities than other areas of interest.

Management Objectives and Strategies defined by the LRMP provide management direction for the proposed protected areas that includes proactive measures such as beetle control and prescribed burning. Prescribed burning has been recommended for the purposes of habitat enhancement and controlling pest epidemics. Controlling beetle outbreaks within protected areas would be suppressing a primary natural disturbance vector, although the effects would be difficult to quantify. Where B.C. Parks would likely manage new protected areas, an LRMP defined strategy would require joint approval from the Ministry of Forests and the Ministry of Environment, Lands and Parks prior to initiating proactive measures in protected areas. A working involvement of both of these agencies would provide a measure of security in terms of scientific and logistical support.

4.2 Ecosystem Representation

There are two useful land classification schemes that capture the variation in plant and animal communities at a sub-regional scale. Ecosections (Regional Ecosystem

Classification) are contiguous areas that are large enough to sustain a variety of plant and wildlife communities; four transect the LRMP area. Biogeoclimatic subzones and subzone variants (Biogeoclimatic Classification) are characterized by a particular combination of dominant plant species; nine occur within the LRMP area. Subzones and subzone variants are dispersed within sub-regional areas and often occur within a relatively narrow elevational range and/or in relation to aspect. Each subzone has different values for different subsets of wildlife species.

It is important to consider both ecosections and subzones/variants to assess the potential impacts to ecosystems at the landscape level.

4.2.1 Ecosections

Of the four ecosections that transect the LRMP area, the Nazko Upland (NAU) comprises the greatest proportion (47%) of the landbase (Figure 2). The NAU ecosection has the greatest proportion of protected areas (11%), including the Entiako and Finger-Tatuk areas of interest. Combined with low intensity resource development areas, a total of 28% of the ecosection area (13% of the gross landbase) would meet high biodiversity objectives. An additional area of interest (Lakes LRMP) could expand the Entiako area of interest and increase the proportion of NAU in protected areas.

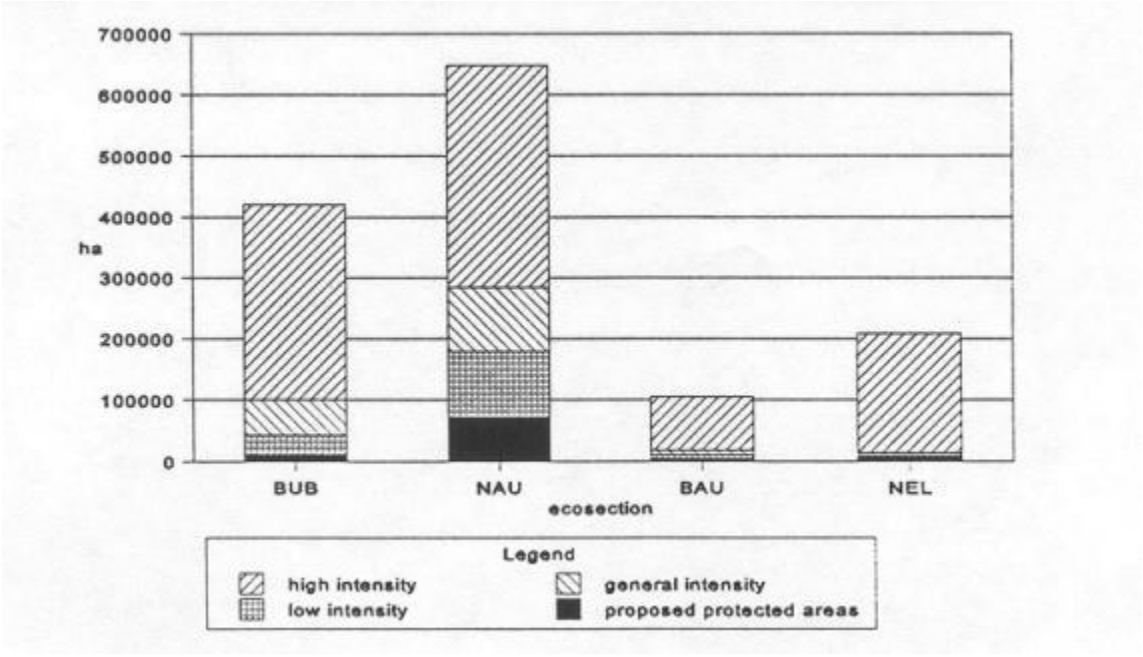

Figure 2. Ecosection Representation within the Vanderhoof LRMP Area.

Approximately 29% of the total provincial area of the Bulkley Basin (BUB) ecosection occurs within the LRMP area. Proposed protected areas within the BUB ecosection include the Francois South and Nechako Canyon areas of interest, which comprise 2% of the ecosection area within the LRMP boundaries. Low intensity resource development zones comprise an additional 8% within the BUB ecosection. Collectively, a total of 10%

of the BUB ecosection would meet high biodiversity objectives. Even with new proposed protected areas the BUB will likely remain poorly represented (Table 5).

Table 5. Ecosection Protection at the Provincial Level

Planning Area		Ecosection/Area (ha)			
		BUB	NAU	BAU	NEL
Vanderhoof	existing protected	287	136	0	139
	proposed protected	9,195	72,437	4,738	7,849
Lakes	existing protected	4,200	n/a	0	n/a
	proposed protected	51,460	n/a	26,275	n/a
Fort. St. James	existing protected	n/a	n/a	297	43
	proposed protected	n/a	n/a	1,940	5,280
Prince George	existing protected	n/a	0	n/a	24,800
	proposed protected	n/a	3,150	n/a	113,950
Cariboo	existing protected	n/a	71,630	n/a	24,867
	proposed protected	n/a	37,920	n/a	n/a
Total Protected		4,487	71,766	297	49,849
Total Proposed Protected		60,655	110,357	6,688	127,079
% of total ecosection potentially protected		4.5%	9%	1.7%	9%

A relatively small proportion (11%) of the total provincial area of the Nechako Lowland (NEL) ecosection occurs within the LRMP area. The proposed Stuart River protected area comprises 4% of the NEL ecosection within the LRMP area. Including low intensity resource development zones, a total of 7% of the NEL ecosection would meet high biodiversity objectives. Additional proposed protected areas include a similar proportion along the north side of the Stuart River (Fort St. James LRMP), an extension to the Stuart River area of interest and several other Goal 1 areas (Prince George LRMP), which could potentially increase the protected area within the NEL ecosection to 9%.

A small proportion (5%) of the total provincial area of the Babine Upland (BAU) ecosection occurs within the Vanderhoof LRMP area. The proposed Sutherland River protected area comprises 5% of the ecosection area within the LRMP area. An additional 6% occurs within low intensity RMZ's. Collectively, 11% of the BAU would meet high biodiversity objectives. Although additional areas of interest in the Fort St. James and Lakes planning areas could potentially increase the total protected area within the BAU ecosection to 1.7%, it would remain poorly represented at the Provincial level

4.2.2 Biogeoclimatic Subzones and Subzone Variants

Where ecosections provide provincial and broad sub-regional perspective for large ecosystems, the Potential impacts of land use activities and intensity within biogeoclimatic subzon/variants are more discernable with respect to plant and animal communities. As such, they are an appropriate indicator of potential ecosystem impacts (Table 6).

Table 6. Indicator, Method and Assumptions for Biogeoclimatic Subzone/Variant Representation.

Indicator	ha of biogeoclimatic subzones/variants in (1) protected areas, (2) low intensity development, (3) general intensity development, and (4) high intensity development (incl. Settlement/Agriculture) areas.
Method	A breakdown of each development intensity option by biogeoclimatic subzone/variant of the total ha in (1) the timber harvesting landbase, (2) forested exclusions, (3) non-forested exclusions, and (4) the gross landbase.
Assumptions	Lower intensity development RMZ's (=high biodiversity emphasis) provide

	more options for maintaining native species and natural ecological processes. ➔ Forested (inoperable, riparian reserves) and non-forested (rock outcrops, swamps) exclusions contribute to biodiversity.

Of the nine subzones/variants occurring within the Vanderhoof LRMP area, five are present in amounts greater than 150,000 ha, including the SBSmc3, SBSdk, SBSdw3, SESmc2 and ESSFmvl, in declining order (Figure 3).

The proportion of SBSmc3 within the LRMP area comprises 94% of the total provincial area. The Consensus Plan proposed protected areas capture 12% of the SBSmc3; 13% in the Base Case. Together with low intensity resource development areas, both scenarios provide adequate representation of this subzone variant.

Although the ESSFmv1 comprises only 12% of the LRMP area, this amount represents 87% of the total provincial area. The Base Case and Consensus Plan protected areas capture 6% of the ESSFmvl, however, the total protected and low intensity is 1% greater (12%) in the Consensus Plan. In addition to resource intensity designations, the total forested and non-forested (brush types and some rock) exclusions account for 43% of the ESSFmvl within the LRMP area (Figure 4). This suggests a larger proportion would meet high biodiversity objectives when considering exclusion areas.

Relative to the total amount of SBSdk within the LRMP area, 2% occurs in proposed protected areas in the Base Case and 3% in the Consensus Plan (a result of a the addition of the Francois South area of interest). Together with low intensity areas, 16% of the total area of SBSdk would meet the objectives for high biodiversity in the Consensus Plan and 20% in the Base Case. It is also important to note that 43% of the SBSdk occurs in the non-forested exclusion category (Figure 4), which reflects the high proportion of private and agricultural lands in the Nechako Valley RMZ. No additional protected areas have been proposed in other planning areas that include SBSdk.

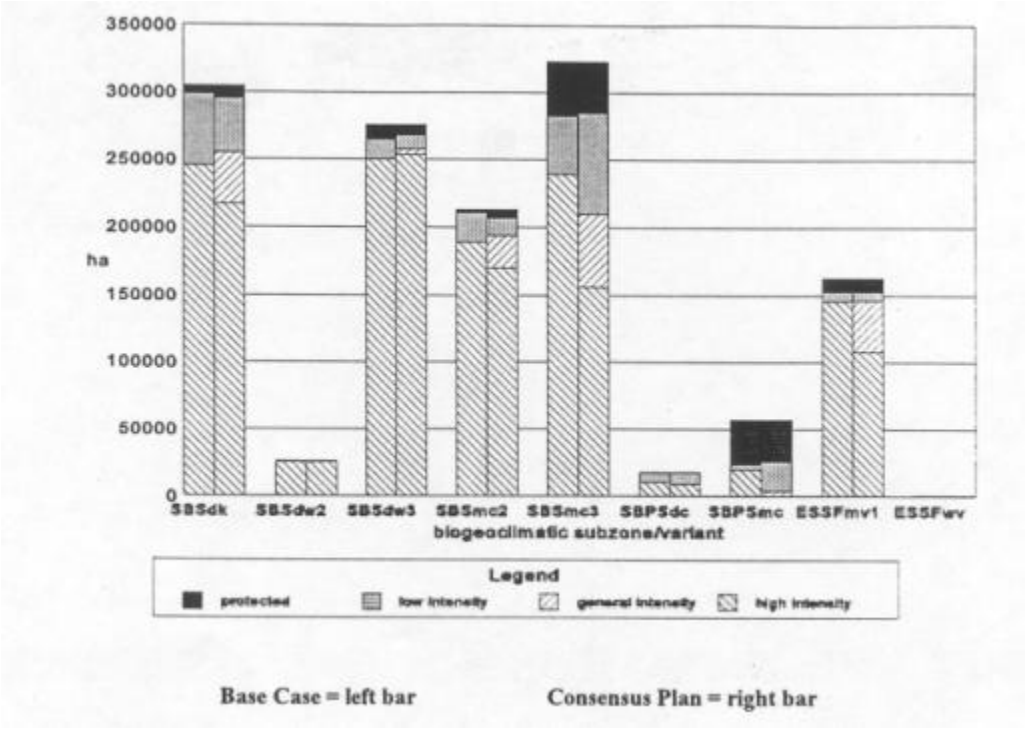

Figure 3. Biogeoclimatic Subzone Representation within the Vanderhoof LRMP area.

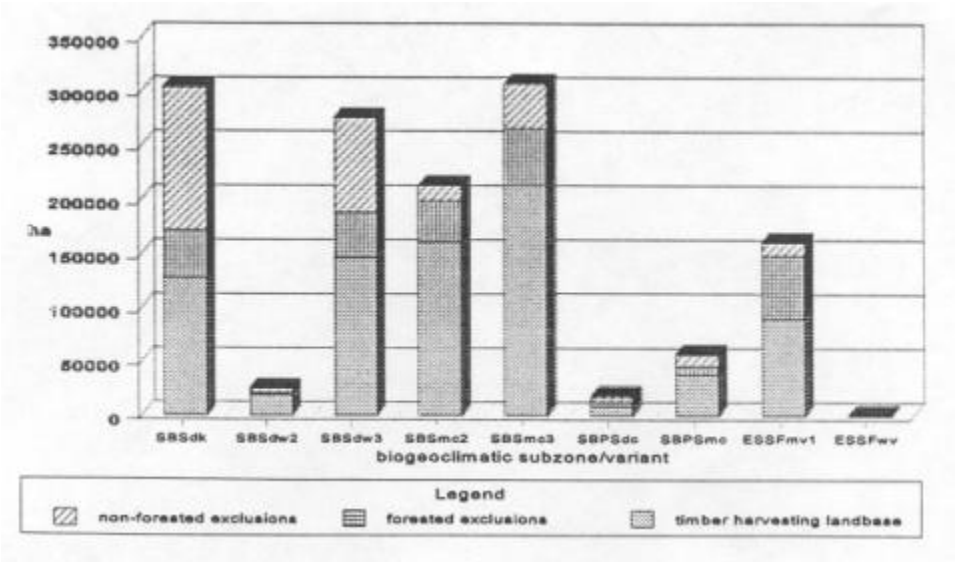

Figure 4. Exclusions from the Timber Harvesting Landbase within the LRMP area.

The SBSmc2 is poorly represented in proposed protected areas in both the Base Case and Consensus Plan (<1%). Collectively, a larger proportion (12%) of SBSmc2 would

meet the objectives for high biodiversity (protected and low intensity) in the Base Case. The SBSmc2 within the LRMP area accounts for 10% of the total provincial area.

4.3 Old Growth

Old growth forests provide essential habitats for plant and animal species which are generally not available in younger forests. Old growth forests are characterized by a wide range of tree ages and sizes (including those of large diameter), multi-layered canopies, standing snags and large logs on the forest floor and in streams.

One of the major threats to old growth forests is fragmentation. Fragmenting old growth stands can have deleterious consequences where increasing isolation of habitats can affect species dispersal and reproductive success. Fragmentation of old growth stands reduces the quality of habitat for various reasons, including: (i) the edges of old growth stands are poorer quality due to increased disturbance (i.e. wind) and climatic extremes; (ii) small stands are not suitable for species that require larger home ranges or forest interior conditions; and (iii) animals and plants moving between widely spaced old growth habitats are susceptible to higher rates of mortality. For these reasons, the long term viability of populations of some species may be lower in landscapes where old growth habitat is highly fragmented.

Riparian reserves, wildlife tree patches and forested exclusions will contribute to the total amount of old growth, however, many will not contain significant areas of forest interior conditions. Riparian reserves will provide travel corridors for old growth dependent species.

The Biodiversity Guidebook was used as a means to evaluate the prospective amount and distribution of old growth in the Base Case and Consensus Plan (Table 7).

Table 7. Indicator, Method and Assumptions for Old Growth Representation

Indicator	% of LRMP area maintained as old growth
Method	Total ha maintained at an old seral stage using the Natural Distrubance Type (NDT) definition of old and target percentages for the relavant biodiversity emphasis.
Assumptions	Old growth provides unique biodiversity values. The closer the total to the target for high biodiversity emphasis (by NDT), the greater the likelihood that key ecosystem elements are maintained. Forested exclusions maintain old growth.

Old growth accounts for 15% of the gross landbase in both the Base Case and Consensus Plan, the majority of which occurs within high intensity resource development zones (Figure 5). The implication is that a greater proportion of young seral forests in high intensity areas would result in sharper habitat transitions and isolate more patches of old growth within a matrix of young forest types. The consensus plan is more favourable that the Base Case as it distributes more old growth into protected and low intensity areas.

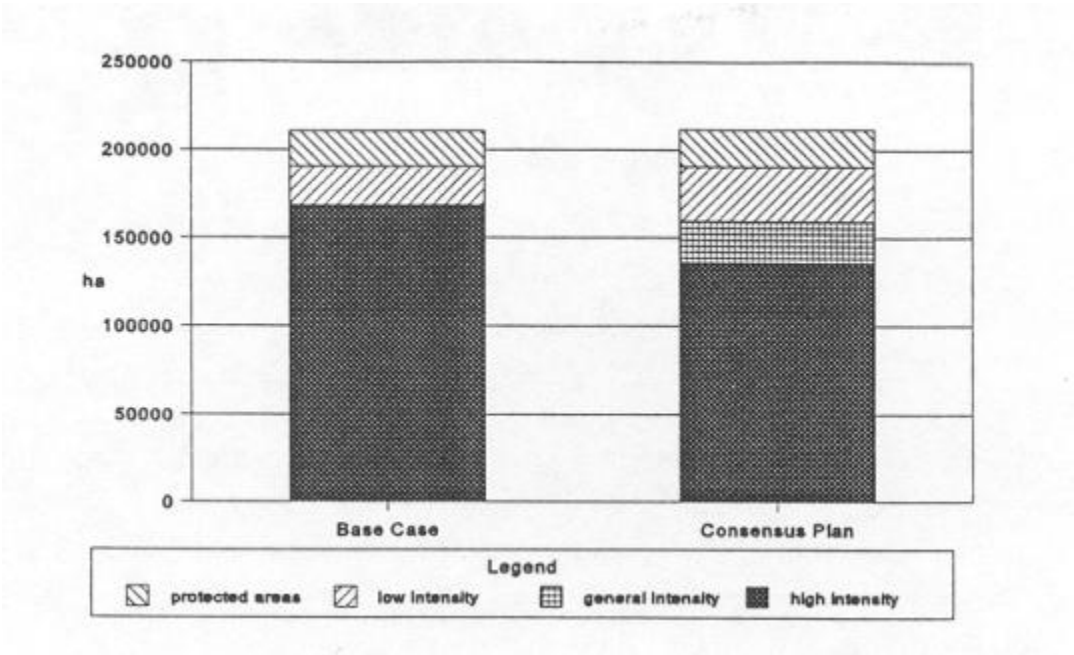

Figure 5. Distribution of Old Growth by Resource Development Intensity Option.

4.4 Landscape Linkages

Landscape linkages are also important in maintaining biodiversity. Wildlife corridors or landscape linkages serve two major functions in biological conservation: (1) they provide habitat for plants and animals; and (2) they act as travel corridors which provides for the seasonal movements and exchange of genetic material in wide ranging species.

The size of protected and low intensity areas and linkages between them is used to evaluate landscape connectivity (Table 8).

Table 8. Indicator, Method and Assumptions for Landscape Linkages

Indicator	the size and connectivity of protected and low intensity development areas
Method	a subjective assessment of the degree of connectivity. FPC FEN's are attributable to the base case except where LRMP direction exceeds the NDT level.
Assumptions	large areas (>5,000 ha) are better than small areas. connected areas (>600 m wide corridors) are better than isolated areas.

In general, the application of FPC riparian management zones and Forest Ecosystem Networks (FEN's) improves the connectivity over the TSR scenario. The Entiako proposed protected area links Tweedsmuir Park and indirectly, the Itchas Ilgachuz proposed protected area in the Cariboo and significantly improves landscape connectivity to the southwest of the LRMP area. The low intensity resource development designation for the Upper Blackwater RMZ and portions of the Laidman Lake and Chedakuz RMZ's in the Consensus Plan further enhances the landscape connectivity in the southwest portion of the LRMP area.

The Consensus Plan identifies a low intensity resource development area adjacent to the Sutherland proposed protected area, which may be expanded by the Fort St. James LRMP and further improve the connectivity to the northwest.

Areas with timber harvesting restrictions to preserve scenic values provide a linkage along the Nechako River corridor in the Base Case and Consensus Plan (a portion of which is designated as low intensity resource development in the latter), although the link is broken at the town of Vanderhoof The Consensus Plan identifies two Forest Ecosystem Networks and recognizes two wildlife movement corridors that are supported within low intensity resource subzones. Additional proposed protected areas, low intensity resource development areas, scenic areas and leave block concepts identified in the Consensus Plan improve connectivity over the Base Case, although in more disjointed areas. Landscape connectivity, apart from FPC riparian management areas, is poor in the eastern portion of the planning area in both the Base Case and Consensus Plan, primarily due to the high proportion of high intensity resource development areas.

5.0 WILDLIFE

5.1 Wildlife Habitats

Biophysical Habitat Classes are relatively broad ecosystem classifications that are used by the Wildlife and Habitat Protection branches of the Mnistry of Environment, Lands and Parks to provide a framework for managing natural resources (i.e. wildlife). Each biophysical habitat class was mapped at the landscape level (1:250,000) and has different values for different wildlife species. The distribution of habitat classes within each of the resource development intensity options allows for an evaluation of potential impacts to various wildlife species (Table 9).

Table 9. Indicator, Method and Assumptions for Wildlife Habitat Assessment	
Indicator	proportion (ha) of biophysical habitat classes in each development intensity option
Method	GIS analysis
Assumptions	Protected areas and low intensity resource development RMZ's provide more options for maintaining natural habitat attributes. The greater the proportion of a particular habitat class in proposed protected areas and low intensity resource development RMZ's, the greater the likelihood that the requirements of wildlife species dependant upon them will be met.

It is important to note that the data used for this analysis is incomplete and should be considered preliminary. Data for approximately 9% of the LRMP planning area were unavailable, largely a result of areas that are unclassified, and to a lesser extent due to data loss. The unclassified areas occur along the southeast boundary (including the Finger-Tatuk area) and a smaller portion in the southwest corner. Data loss is largely associated with very small habitat polygons distributed throughout the planning area. The data gaps affect the results, however, it is likely that habitat classes are affected to a similar extent, minimizing the bias in results. Successional stage and aspect influences are not considered in this portion of the analysis but were used to develop feature indicator species mapping.

Two habitat classes dominate the landscape within the LRMP area (70% collectively); Subboreal White Spruce - Lodgepole Pine (SL), and White Spruce - Subalpine Fir (SF). These habitat classes are important for timber production and are widely distributed in large, relatively contiguous polygons that sustain primary habitats for species such as moose, marten, grizzly bear and caribou. A total of 11% of the SL and 20% of the SF habitat classes occur in low intensity resource development and proposed protected areas (Figure 6). This provides core areas of high quality habitat for many species in the western portion of the LRMP area.

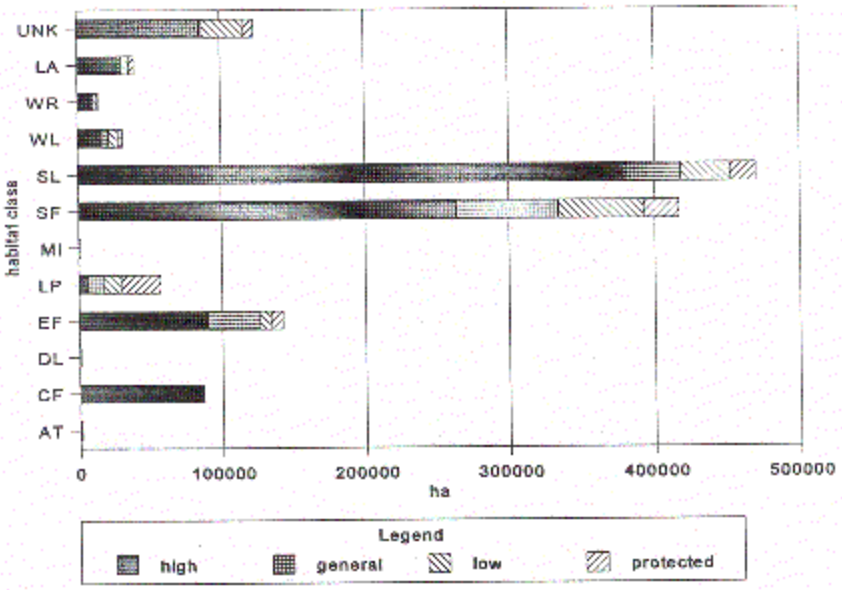

Figure 6. Biophysical Habitat Classes within the Vanderhoof LRMP Area

UNK	unclassified	MI	Mine
LA	lakes/reservoirs	LP	Lodegepole Pine
WR	White Spruce - Black Cottonwood	EF	Engetmann Spruce - Subalpine Fir
WL	Riparian	DL	Douglas-fir - Lodgepole Pin
SL	Wettand	CF	Cultivated Field
SF	Subboreal White Spruce - Lodgepole Pine White Spruce - Subalpine Fir	AT	Alpine Tundra

The Engelmann Spruce - Subalpine Fir (EF) habitat class comprises a significant proportion of the LRMP area (11%), most of which occurs in large, contiguous polygons. This habitat class sustains primary habitats for wildlife species such as caribou and grizzly bear. In addition to the 11% that occurs in low intensity resource development zones and proposed protected areas, a significant proportion (43%) of the total area occurs in forested exclusions. A significant proportion of the EF habitat class would, therefore, be maintained in a natural state in the Consensus Plan.

A total of 70% of the Lodgepole Pine habitat class, which comprises approximately 5% of the LRMP area, occurs in low intensity resource development zones and proposed protected areas. This reflects a high level of protection for habitat values for species such as caribou and marten.

Although the total area within the Wetland habitat class suggests it comprises approximately 2.5% of the LRMP area, the total is likely an underestimate where many wetlands are small and difficult to map at the landscape level. Wetlands provide important habitat for a large number of wildlife species including moose, aquatic furbearers, waterfowl, great blue heron and American bittem. Approximately 30% of

the identified wetlands occur in low intensity resource development zones and proposed protected areas. Although wetlands receive some protection through the FPC in the Base Case, the LRMP defined management strategies in the Consensus Plan identify several wetland complexes and riparian habitats as wildlife movement corridors. Wetland habitats within high intensity resource development zones are more likely to become isolated as timber is harvested around them to the nominal (FPC) riparian management zone widths.

The White Spruce - Black Cottonwood Riparian (WR) habitat class, which comprises approximately 1% of the LRMP area, receives a disproportionately greater amount of use by a wider range of species than any other habitat class. The WR occurs along the major rivers and functions as a wildlife movement corridor, provides critical spring and winter range for ungulates, spring and fall habitat for grizzly bear and nesting habitat for bald eagles. Approximately 23% of the WR identified occurs in low intensity resource development zones and proposed protected areas. Riparian reserve and management zones (FPC), inoperable slopes and environmentally sensitive areas would likely significantly increase the protection of this habitat type.

Douglas-fir occurs in small stands or as scattered individuals; rarely as a leading species. Douglas-fir trees are fire resistant and often remain as veterans in regenerating stands following wildfire, providing habitat complexity and critical mule deer winter range (when in stands). The identified areas of the Douglas-fir - Lodgepole Pine habitat class occur in general (95%) and high (5%) intensity resource development zones and comprise less than 1,000 ha of the LRMP area. The lack of a formal management strategy to maintain Douglas-fir in the TSR and Base Case results in a continued negative trend. However, the LRMP has recommended that Douglas-fir be maintained across the planning area in proportion to the existing amounts.

5.2 Species at Risk

A relatively small number of species (11) occurring within the Vanderhoof LRMP area occur on the Conservation Data Centre Red and Blue lists; candidates for legal designation as rare or endangered and threatened or vulnerable, respectively. Most of these species are habitat specialists and are found in low numbers and/or are widely distributed on the landscape. In addition, observations and known occurrences likely only represent a small proportion of the actual occurrences. In light of these facts, an assessment of the potential impacts to these species is largely limited to professional judgement, based on the best available information and biological rationale. In most cases, general trend statements are used to demonstrate the incremental differences between the TSR, Base Case and Consensus Plan (Table 9). Exceptions include grizzly bear and woodland caribou, which are discussed in more detail in the following sections of this analysis.

Table 9. Red and Blue Listed Species Trends within The Vanderhoof LRMP Area

Red List	Sensitivity	TSR	Base Case	Consensus Plan

white sturgeon	water quality and quantity	unknown	research underway to identify status	same as Base Case
American white pelican	water recreation activities	unknown	unknown	unknown
Blue List				
woodland caribou	increased access, logging	high risk (see text)	moderate risk (see text)	reduced risk (see text)
grizzly bear	increased access poaching	high risk (see text)	moderate risk (see text)	reduced risk (see text)
fisher	overtrapping reduction in old forest/riparian, loss of denning sites (large diameter snags)	high risk due to increased access, loss of denning sites, reduction in old forest, riparian impacts	moderate risk with FPC riparian protection, wildlife tree retention and seral stage requirements	reduced risk with 14% less area in high intensity RMZ's where loss of denning sites may be a limiting factor
northern bog lemming	riparian disturbances in high elevation wet meadows	unknown (no occurrence records)	unknown	unknown
trumpeter swan	disturbances on wintering grounds	unknown	unknown	unknown
sandhill crane	harassment, poaching	unknown	unknown	unknown
great blue heron	riparian disturbance	moderate risk due to lack of wetland/ riparian protection, known	reduced risk with FPC wetland/ reparian protection, known	low risk with FPC wetland/ riparian protection, known occurrences in

		occurrences in high intensity RMZ	occurrences in high intensity RMZ	low intensity RMZ
American bittern	riparian disturbance	moderate risk due to lack of wetland/ riparian protection	low risk with FPC wetland/ riparian protection	same as Base Case
bull trout	road development, disturbance of small stream habitats, overfishing	high risk with lack of riparian protection and high proportion of high intensity development (89%)	moderate risk with FPC riparian protection and reduced high intensity development RMZ's (83%)	moderate risk with FPC riparian protection and reduced high intensity development RMZ's (69%)

A general lack of information with respect to population size, distribution and status for the white sturgeon and northern bog lemming largely precludes a reasonable assessment. However, in the case of white sturgeon, which are known to occur in the Fraser Lake and the Fraser, Nechako, Stuart, Stellako and Nautley rivers, the sensitivity to water quality and quantity, as well as overfishing are concerns that suggest future impacts may be realized.

The outlook for species that are dependent on riparian habitats, such as the great blue heron and American bittern improves with the application of FPC stream and lakeshore reserves. However, many riparian habitats occur on private land and therefore remain at risk from human disturbance. Overall, there will be benefits from managing more landscape units and key habitat types for high biodiversity compared to the base case.

5.3 Feature Indicator Species

Three wildlife species were chosen as indicators for the resource analysis; moose, marten and grizzly. The primary criteria in the selection of appropriate species include: (i) the data must be available, (ii) they must be sensitive to habitat change, (iii) their habitat requirements should overlap a number of other species, (iv) different species should be selected to cover a range of habitat types, and (v) selected species should occur throughout the sub-regional planning area. The proportion of high quality habitat occurring in high intensity resource development RMZ's is an appropriate indicator of potential impacts to each species (Table 10).

Table 10.Indicator, Method and Assumptions for Feature Species

Assessment	
Indicator	ha of high quality habitat for feature species - moose, marten and grizzly in high intensity development (incl. Settlement/Agriculture) zones.
Method	Use MoELP mapping for feature species. GIS analysis.
Assumptions	The greatest Potential for increased road access, habitat fragmentation and impacts to seral stage distribution and habitat structural attributes occurs in high intensity RMZ,s High quality moose, marten and grizzly habitat is representative of requirements for a broad range of wildlife species. The default biodiversity emphasis for all RMZ's is low for the base case.

5.3.1 Moose

Moose were selected as an indicator species because they occur throughout the study area and they represent a wide range species with requirements for mixed seral stages, understory shrub layers and riparian habitats. Moose are sensitive to intensive brush control, increased levels of access and degradation of critical winter ranges.

Increased access and brush management would likely act to lower moose numbers in high intensity areas in the long term in the TSR and Base Case scenarios due to increased hunter harvest, decreased forage and cover adjacent to forage areas. Urban and agricultural development in the Nechako Valley RMZ has alienated mixed and deciduous (birch and aspen) habitats, which has likely permanently reduced the carrying capacity of the area. The distribution of high value moose habitats is strongly bimodal in the Base Case, with the largest proportion (80%) occurring in high intensity resource development areas (Figure 7).

Protected areas, riparian management zones and wildlife tree patches provide thermal and security cover in the Base Case and Consensus Plan. Low intensity areas and LRMP defined FEN's, vegetation management recommendations, movement corridors and access restrictions create a more favourable outlook for moose, which may result in stable or potentially higher populations in the long term.

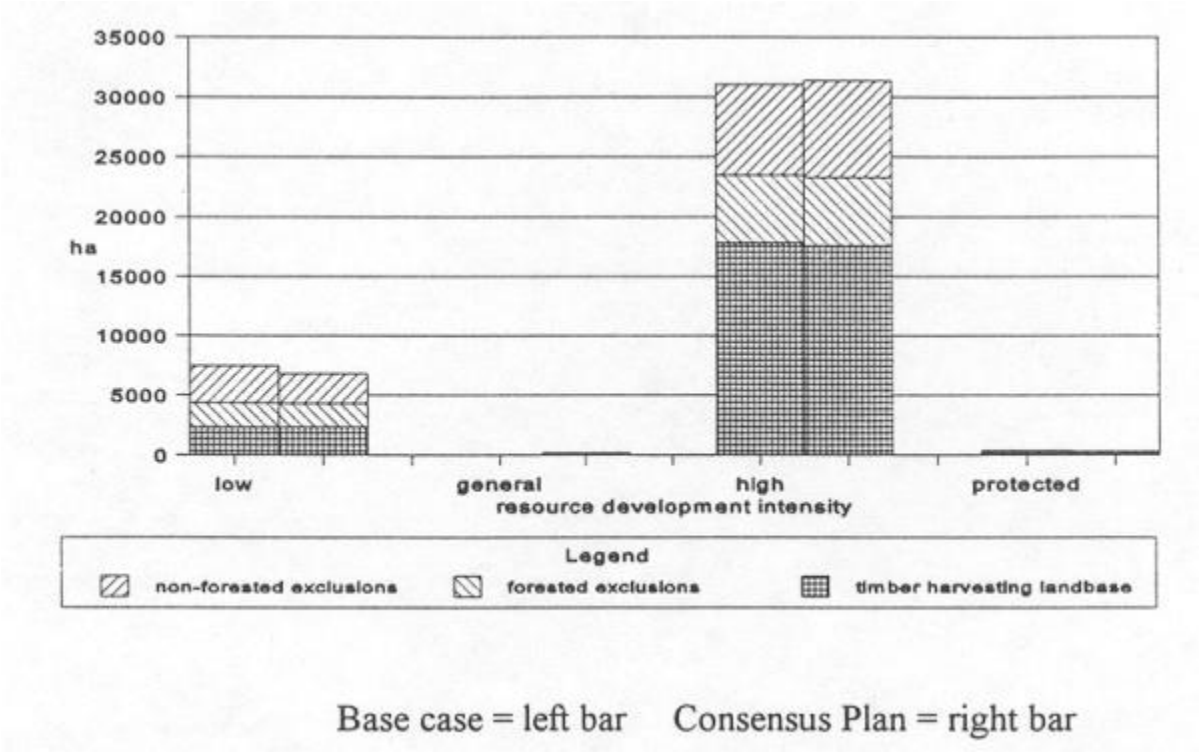

Figure 7.Distribution of High Value Moose Habitat

5.3.2 Marten

Marten were selected as an indicator species due to their dependence on mature and old growth forest types and their sensitivity to habitat fragmentation. Marten are also widely distributed within the LRMP area, although suitable habitats are lacking through the settlement corridor in the Nechako Valley RMZ.

Marten populations are disproportionately impacted with increasing levels of habitat fragmentation, beginning with first pass harvesting in an area. The existing pattern of harvest is that of relatively evenly dispersed, medium-sized cutblocks and nominal leave areas. A continuance of this pattern of harvest (i.e. TSR) would likely significantly decrease the carrying capacity across the LRMP area. An exception may be within the Laidman RMZ, where the high proportion of forested exclusions (mostly inoperable areas) would buffer potential timber impacts.

A large proportion (80%) of high value marten habitat occurs in high intensity areas in the Base Case (Figure 8). Shorter rotations, lower old growth and patch size requirements, reduced amounts of coarse woody debris and slash increase the risk to marten in high intensity resource development areas. The recommendations for aggregated harvest units and large leave areas in the Consensus Plan would partially mitigate the potential impacts in the long term. The addition of new protected areas improves the outlook, but over a limited area.

The gradual loss of suitable denning sites (large diameter snags) in high intensity areas may be a limiting factor in long term management under default FPC regulations.

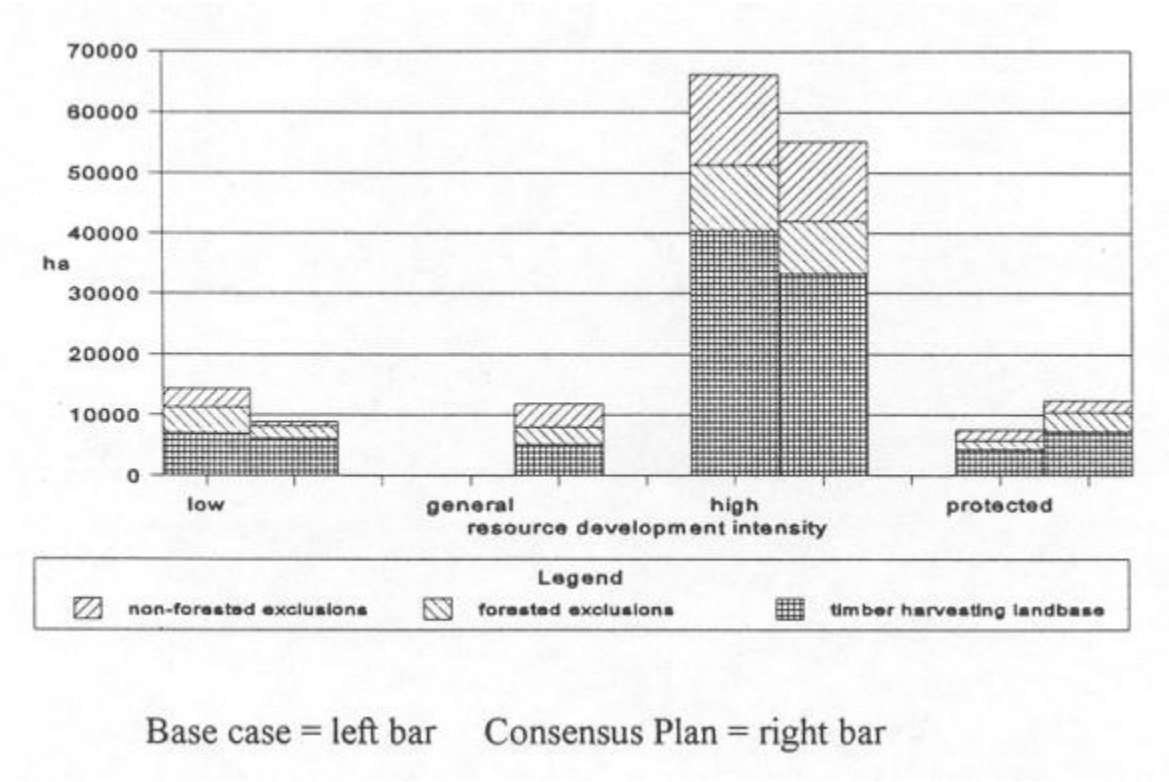

Figure 8. Distribution of High Value Marten Habitat

The Consensus Plan decreases the proportion of the land base in high intensity areas, and correspondingly, the proportion of high value marten habitat in high intensity areas. The increased proportion of low intensity areas in the Consensus Plan has resulted in less high value habitat occurring in low intensity areas. This is due to the redistribution of visually sensitive areas and modifications to proposed protected areas in the Base Case. Conversely, the modifications in proposed protected areas has increased the proportion of high value marten habitat in protected areas. LRMP defined management objectives and strategies with respect to maintaining stand structural attributes (including coarse woody debris) is a mitigating factor. The Consensus Plan is the most favourable scenario for marten, however, reduced carrying capacities are likely over the long term in high intensity areas.

5.3.3 Grizzly Bears

Grizzly bears are currently blue-listed (on a provincial basis) because they are vulnerable to human disturbances and have large home range requirements and a low reproductive rate. It is generally accepted that grizzly bears require large relatively undisturbed areas to reduce bear-human conflicts as most of the potential threats to grizzly bear populations are related to human settlement and road access. However,

large, relatively undisturbed areas are becoming increasingly rare, which implies that the majority of grizzly bear habitat will require a coordinated approach to habitat management such as that recommended in the **Grizzly Bear Conservation Strategy, (1995).**

Grizzly bears require a variety of seral stages to meet seasonal habitat requirements. Important habitats include mature forests, herb-dominated avalanche chutes, subalpine meadows, riparian areas, floodplains, salmon-bearing streams, and habitats containing berry- producing shrubs. Intensive silvicultural practices can reduce the amount of herbaceous forage and berry-producing shrubs by favouring early conifer establishment.

A significant proportion of grizzly habitat occurs in high intensity resource development areas in the Base Case (Figure 9). These are viewed as high risk areas due to increased road densities and access into remote areas. The Consensus Plan increases the proportion of grizzly habitat in low intensity and protected areas, and correspondingly decreases the proportion in high intensity. Low intensity areas adjacent to proposed protected areas (Sutherland, Crystal and Laidman RMZ's) increase the viability as grizzly habitat. In addition, LRMP defined access management restrictions in these areas is favourable.

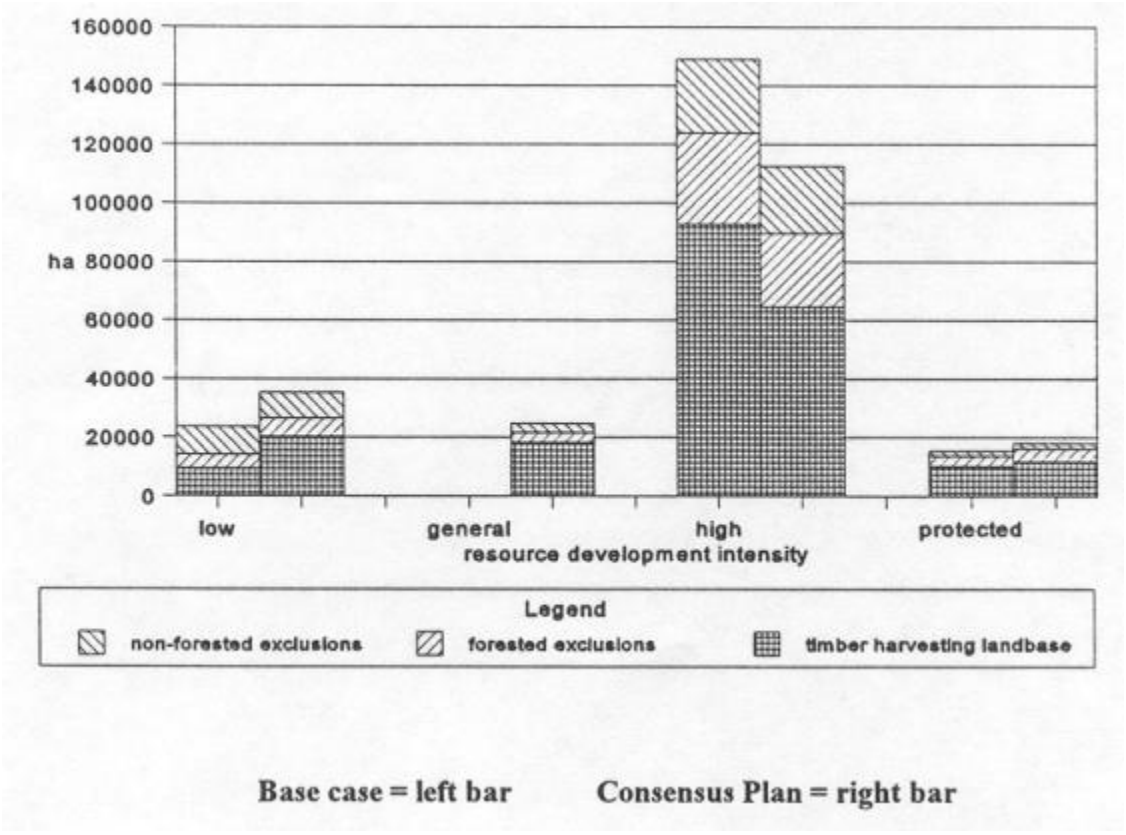

Figure 9. Distribution of Medium Value Grizzly Habitat

5.3.4 Woodland Caribou

Woodland caribou were not selected as an indicator species due to their limited range within the LRMP area and specific habitat requirements. The Tweedsmuir-Entiako caribou herd (approximately 500 animals) occur in the southwest portion of the LRMP area. The potential impacts to this herd are primarily associated with the direct loss of habitat from logging, and increased access and disturbance.

At the time of the TSR, the key caribou areas were deferred from harvest but no formal management plan had been developed. Correspondingly the risk to the herd was high. The proposed Entiako protected area in the Base Case captures the critical habitat areas but the lack of a management plan to address access and timber harvesting in adjacent, lower value caribou habitats does not eliminate the risks. The existing mineral claim areas in the Entiako area of interest are excluded in the RPAT proposal.

The Consensus Plan decreases the total amount of protected area in the Entiako area of interest, excluding a portion of low value caribou habitat. LRMP defined objectives and strategies address access and timber harvesting adjacent to the Entiako area of interest and do not exclude the existing mineral claim areas from the revised area of interest. The strategy would allow the potential mine to continue its operations with the intent that claim areas would be incorporated into the protected area after the claims lapse. Without knowing the potential lifespan of mining activity or extent of potential additional exploration and development, there continues to be a higher risk of impacts to caribou than the Base Case. The comprehensiveness of the LRMP recommendations, particularly the access management strategies in the Laidman zone, are a mitigating factor.

6.0 Fisheries

6.1 Stream Fisheries

Watershed assessment procedures developed for the FPC have become an essential analytical tool for evaluating the cumulative effects of development activities on the natural hydrologic and sediment transport regimes of rivers throughout the Province. Watershed assessments provide documentation of the development status of a drainage based on clearcut equivalency and hydrologic recovery. Timber harvesting and non-forested areas are used to calculate **clearcut equivalency,** defined within a hydrological context as the proportion of a watershed area in a disturbed or early seral state and lacking the hydrological characteristics of mature forest stands. Elevation and forest type are important considerations due to the influence on channel hydrology and sediment transport.

The relationship of increasing equivalent clearcut area with an increasing proportion of high intensity resource development and settlement/agriculture areas within a watershed management unit approximates the potential impacts on stream fisheries values (Table 11). The assessment of the relative magnitude and significance of the potential impacts on fisheries values requires professional judgement where future conditions such as harvest rates within sub-basins and road densities are difficult, if not impossible to predict relative to known fisheries values within management units.

The fisheries units used for the analysis were co-operatively defined by the Ministry of Environment, Lands and Parks and the Department of Fisheries and Oceans. The boundaries of fisheries units are common to the landscape units identified in the Plan document, which will facilitate management decisions in the future (Figure 10). Two landscape units were subdivided to accomodate different watershed and fisheries management concerns and values. The primary criteria for defining the watershed management units include (i) areas with similar topography, (ii) areas with similar management concerns, and (iii) areas with similar fisheries habitat values.

Table 11. Indicator, Method and Assumptions for Fisheries Impact Assessment

Indicator	proportion of river watersheds/sub-basins in a high intensity development zone (incl. Settlement/Agriculture).
Method	Total the high intensity resource development areas (incl. Settlement/Agriculture) for each watershed unit. Use professional judgement to assign a value of $^{-}2$, $^{-}1$, 0, $^{+}1$, $^{+}2$ to each unit ($^{-}2$=strong negative impact, 0=no impact, etc.).
Assumptions	High intensity development= 1) greater road density and road life 2) a greater proportion of lands in an early or arrested state of hydrologic recovery, 3) a greater potential for cumulative impacts associated with nutrient loading and chemical use 4) a greater potential for low flow impacts associated with greater demands for water use, and 5) fewer opportunities for enhanced riparian protection.

A total of 9 of the 18 fisheries units identified have greater than 80% of the unit area designated as high intensity resource development intensity in the Consensus Plan (Figure 11). Settlement and agricultural lands comprise a significant proportion of lands in the Nechako, Cluculz;_A, Cluculz_B, Tachick_A and Endako and Nithi fisheries units. The fact that these lands are largely in an early or arrested state of hydrological recovery and are not subject to the requirements of the FPC were important considerations in the assessment of potential impacts. Additionally, the larger Nechako, Chilako and Endako Watershed Planning areas identified in the **Salmon Watershed Planning Profiles for the Fraser Basin within the Vanderhoof Land and Resource Management Plan** (DFO 1995), are described as the first, second and third priority watersheds (respectively), having the highest level of development concerns and sensitive features. The report comprehensively describes the existing conditions, concerns and considerations for watershed areas throughout the LRMP planning area and was also used in the resource analysis.

The potential aggregate impacts at the LRMP level are minimized in the Consensus Plan, with an overall net benefit to fisheries values, in terms of the level of protection (Table 11). In total, the potential impacts to fisheries values sum to -19 in the TSR, +2 in the Base Case and +8 in the Consensus Plan. In general, cumulative watershed impacts in the TSR scenario are primarily a result of the large proportion of the LRMP area occurring in high resource development intensity designations (89%). Mitigating factors in the TSR are limited to areas with restrictions on timber harvesting associated with restrictive visual quality objectives (i.e. Nechako and Stuart river corridors), the Chedakuz Riparian Management Area, local resource planning along the Blackwater River, and access management and netdowns for ESA'a and inoperable areas in the Entiako area.

The introduction of new (proposed) protected areas and the FPC improve the outlook for fisheries values in the Base Case. The primary aspects of the FPC that benefit fisheries values include watershed, gully, terrain and site hazard assessments, riparian reserve and management zones, wildlife tree patch retention, seral stage and distribution requirements, soil conservation requirements and road construction, maintenance and deactivation requirements. The liabilities associated with meeting the FPC requirements provide a measure of security for compliance. The watershed restoration program, funded through Forest Renewal BC, has a significant potential to restore impacted fish habitats, however, the distribution and level of effort is unknown at this time.

Figure 10. Vanderhoof Fish Units

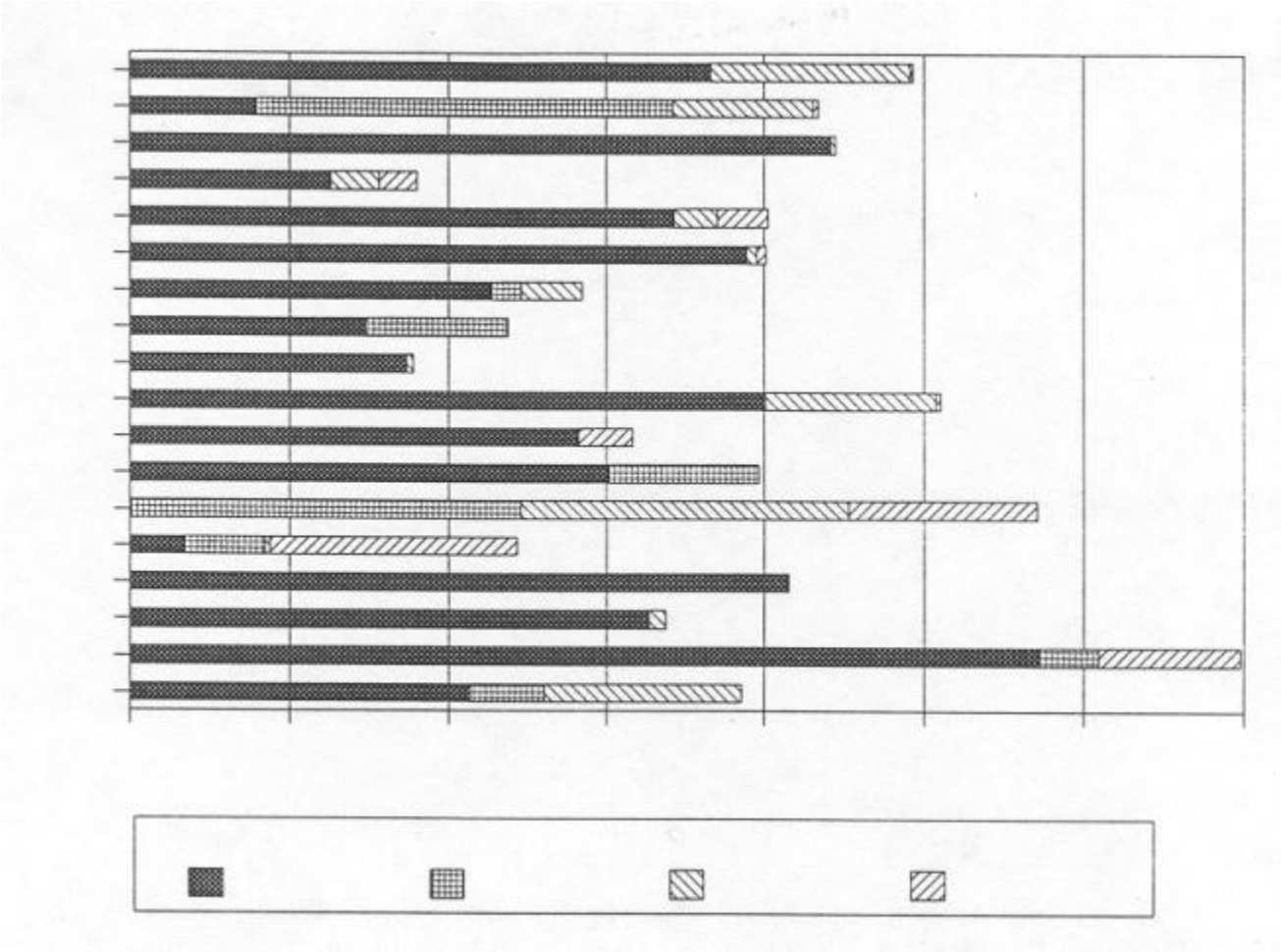

Figure 11. Distribution of Resource Development within Fisheries Units

TT	-	Tatelkuz	KL	-	Kluskus	ENb	- Entiako_B
TCb	-	Tachick_B	LU	-	Lucas	ENa	- Entiako_A
TCa	-	Tachick_A	JB	-	Jerryboy	CLb	- Cluculz_B
SU	-	Sutherland	HA	-	Hallet	CLa	- Cluculz_A
ST	-	Stuart	NI	-	Nithi	CH	- Chilako
NE	-	Nechako	ED	-	Endako	BW	- Blackwater

Table 11. Potencial Impacts to Fisheries Habitat

	BW	CH	CLa	CLb	ENa	ENb	ED	NI	HA	JB	LU	KL	NE	ST	SU	TCa	TCb	TT
TSR	+1	-2	-2	-2	-1	0	-2	-1	-1	0	-1	-2	-2	0	-1	-2	-1	0
Base	+2	-1	-1	-2	+1	+1	-1	0	0	+1	+1	-1	-2	+2	+1	-1	+1	+1
Plan	+2	-1	-1	-2	+2	+2	-1	0	+1	+1	+2	0	-2	+1	+2	-1	+2	+1

impact ranking value definitions:

+2 - significantly enhanced protection for fisheries values
+1 - moderately enhanced protection for fisheries values
0 - no anticipated impacts or benefits to fisheries values
-1 - moderate impacts to fisheries values
-2 - significant impacts to fisheries values