A Component of British Columbia's Land Use Strategy

Morice

Land and Resource Management Plan

Socio-Economic & Environmental Assessment

Ministry of Agriculture and Lands
Integrated Land Management Bureau
June 2008

Reporting Date

This Socio-Economic and Environmental Assessment (SEEA) report was prepared in February 2007 based on data extracted from a socio-economic assessment (SEA) report and environmental risk assessment (ERA) completed in 2004, and analyses and updates undertaken in August 2006. It was undertaken to support decision making on the Morice LRMP announced in July 2007.

Acknowledgments

The SEA part of the report and the integration of the SEA and ERA into the SEEA were prepared by Pierce Lefebvre Consulting for the Ministry of Agriculture and Lands and the Integrated Land Management Bureau (ILMB). The ERA was prepared by Allan Edie and Associates for the Ministry of Agriculture and Lands, and ILMB. Direction and editorial input on the SEEA was provided by Jim Johnston and Ian McLachlan of the Ministry of Agriculture and Lands, Crown Land Administration Division and Geoff Recknell of the Integrated Land Management Bureau.

Valuable comments on SEEA drafts were provided by Steve Gordon, Norman Marcy and Sara Dickinson.

In addition to the work by Pierce Lefebvre Consulting and Allan Edie and Associates this SEEA report draws heavily on two sources of data: firstly GIS data, maps and assistance supplied by William Elliot of GeoBorealis and Loretta Malkow of the ILMB-GEOBC Spatial Analytical Services Branch; and secondly timber supply analyses conducted by Andrew Fall of Gowlland Technologies. A number of sector representatives were interviewed and greatly assisted the assessment.

In developing the socio-economic estimates prepared for this study, the consultants have made several forecasts and assumptions utilizing information gathered under the time and resource constraints imposed on this study. Socio-economic impact assessments are subject to a high degree of uncertainty, particularly as forecasts extend over periods of several decades. The forecasts and assumptions utilized herein are thought to be reasonable and suitable for the purposes of this analysis, but should not be relied upon for other purposes.

The analysis was carried out in general accordance with the methods and requirements presented in the Ministry of Agriculture and Lands document titled *Guidelines for Socio-Economic and Environmental Assessment (SEEA)*.

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Socio-Economic and Environmental Assessment of the Morice Land and Resource Management Plan

TABLE OF CONTENTS

LIST OF TABLES

LIST OF CHARTS

LIST OF APPENDICES

EXECUTIVE SUMMARY

The Morice Land and Resource Management Plan (LRMP) area covers approximately 1.5 million hectares in northwest BC. The intent of the Morice LRMP is to provide strategic direction for the sustainable management of the Crown land, and land based resources, in the plan area. The general objectives of an LRMP are:

- To reduce and resolve land use conflicts,
- To ensure sustainable resource management, and
- To provide economic diversity and security.

This report assesses the likely socio-economic and environmental implications of the LRMP assuming that the management direction outlined in the LRMP will be applied and enforced[1,2,3].

Overview of the Morice LRMP Area

The Morice LRMP area economy depends very heavily on the forest sector and to a lesser extent on mining, tourism and agriculture. The area supports a broad spectrum of outdoor recreation opportunities, fish and wildlife based tourism, and many forms of hunting and gathering activities. Approximately 5,200 people reside in the plan area, including 3,600 in Houston, 350 in Granisle and the balance in other smaller communities or rural areas. First Nations with an interest in the Morice LRMP area include the Office of the Wet'suwet'en, the Lake Babine Nation (including the Nedo'ats Hereditary Chiefs), the Wet'suwet'en First Nation (Carrier Sekani Tribal Council), the Cheslatta Carrier Nation and the Yekooche First Nation.

The goal of the Morice LRMP is to enhance certainty of access to Crown land resources for each of the various industrial sectors in the plan area while protecting recreation, ecological and cultural heritage values that are important to the region. Key elements of the Morice LRMP and associated socio-economic impacts are described as follows.

LRMP Implications by Land-Use Zone

Under the LRMP there are five categories of land-use applying to the proportions of the Plan Area as described.

Protected Areas

- 8.3% of the Plan Area, 2.6% of the Timber Harvesting Land Base (THLB), 0.4% of agricultural use areas and no developed mineral prospects.
- Include nearly one third of the remaining undeveloped backcountry recreation area and high opportunity tourism areas, as well as significant First Nations cultural heritage sites and

[1] No attempt has been made to assess the likelihood or feasibility of implementing the management direction and achieving the objectives specified in the LRMP

[2] The socio-economic analysis updates the previously published analysis in Pierce Lefebvre Consulting (2004). Likewise the assessment of the likely implications of the LRMP for the achievement of ecological objectives draws upon and updates the previously published Environmental Risk Assessment report, Edie A. and Associates, *Morice Land & Resource Management Plan Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June 2004.

[3] Note that this report does not explicitly take into account the impact of the mountain pine beetle (MPB) epidemic in the Plan Area but some comment is made on the extent to which it is likely to affect the conclusions.

values.

No Timber Harvest Areas

- 18.1% of the Plan Area,1.0% of the current THLB, almost all of the remaining undeveloped recreation areas and an additional one third of the High Tourism Opportunity lands in the Morice plan area.
- The No Timber Harvest areas will help protect ecological, recreation and First Nations values, without making the very high mineral potential in these areas unavailable for exploration and development.

Other Area Specific Management

- 9.5% of the Plan Area, 11.9% of the THLB.
- Focuses on recreation, tourism, cultural and ecological values.

General Management Direction

- LRMP provides general management direction (GMD) for the full spectrum of plan area resources, to be applied across the entire plan area.
- The GMD should enhance the security of many of the area's key resource values, through the management of site specific features, access management, ecosystem management measures and consultation.
- The GMD will likely have some cost implications for some resource development activities.

Water Management Area

A Water Management Area has been designated comprising 23% of the Plan Area to be managed to ensure that the habitat and water quality supporting salmon are unaffected by human activity. It is spread across the above identified zones, 34% in Protected areas, 38% in No Timber Harvest areas, 12% in Area Specific Management areas and 16% in the General Management areas.

Industrial Sector Impacts

Forestry

- The benefits of the plan to the forest industry include an increase in land use certainty, and support for forest product certification initiatives.

- Timber supply modeling simulations indicate that a 7.4% decline in annual long term timber supply may result from implementation of those aspects of the Morice LRMP that are amenable to modeling.

- Applying Ministry of Forest and Range (MOFR) harvest flow policy to the downward pressure on timber supply indicates that the Allowable Annual Cut (AAC) can be maintained at the current level for one decade, before beginning a series of stepdowns to a long term stabilized level in the fourth decade which is 14.8% below the current level. (**It should be noted that strategies to address the Mountain Pine Beetle infestation are likely to alter the application of MOFR harvest flow policy to Morice LRMP impacts, and hence the timing of associated impacts).**

- The AAC in the Morice LRMP area (Morice TSA) has been fully utilized over the past several years, and any downward revision in AAC relative to the base case, is likely to result in a

reduction in forest industry activity both inside and outside the plan area. Timber harvests equivalent to the modeled timber supply have therefore been assumed.

- The stepdown in stumpage revenues over four decades, which would not begin until the second decade under the MOFR harvest flow policy scenario, is equivalent to a loss of $2.8 million per annum starting immediately and continuing indefinitely.

- An average of 112 direct forest industry jobs would be at risk over the first six decades of the harvest flow policy scenario, and 98 thereafter. Following the timber supply impact pattern, the direct job impacts would range from 0 in the first decade to 214 in the fourth decade, relative to base case projections.

Mining

- The LRMP is expected to provide greater certainty to miners as to where in the Plan Area and under what circumstances they will be able to explore for and subsequently develop mineral prospects. In particular it provides greater clarity on First Nations requirements that mining companies will need to address, or initiates and accelerates the development of guidance on these requirements (e.g. the specification of Water Management Area standards).

- It does make 8.5% of Very High and High metallic mineral potential unavailable for exploration and development, which will likely translate into some loss of employment and net economic value in the long term. These inaccessible lands constitute 0.3% of the Very High and High metallic mineral potential lands in BC

- In the short run at least, the lack of specificity in the standards required to be met in the Water Management Area is likely to lead to increased uncertainty for miners and possibly some negative impacts on investment in exploration and development.

Backcountry Tourism and Recreation

Significant net benefits are expected for these sectors arising from the exclusion of logging from some areas, the protection of specific features and sites and the management of access (including the creation of non-motorized and motorized zones), all of which will contribute to the preservation and improvement of recreational experiences.

Agriculture

Net impacts on this sector are expected to be positive.

Other Industrial Sectors

Oil and gas are not expected to be impacted by the LRMP, the Nechako reservoir should not be impacted but there may be some impacts on the potential for small scale hydroelectric development in the plan area. Botanical forest products are expected to benefit.

Net Economic Value

From a Net Economic Value (NEV) perspective, the costs related to changes in forest industry activity and mining industry activities should be compared with the benefits associated with maintaining or expanding recreation value, backcountry tourism, botanical forest products, agriculture and trapping. The negative forestry NEV impacts have been estimated at $3 million per annum as a discounted annuity plus potentially $1 million in additional harvesting costs. It has not been possible to estimate the net costs to the mining sector due to major difficulties of

predicting the likelihood of successful exploration and mine development.

The sectors and activities that are expected to experience net economic benefits (with the exception of recreation) are currently very small in terms of their contribution to the flow of net economic value from the Morice LRMP area. Benefits to these sectors are likely to occur over a long time horizon, and are unlikely to offset the costs incurred from changes in forest industry activity, which are expected to begin one decade from now.

The NEV accounting is incomplete, as it does not include externalities arising from forestry and mining sector activities. Concerns expressed by planning table representatives, as well as the base case environmental risk assessment for the Morice LRMP, indicate that there are negative externalities associated with the base case rates and methods of timber harvesting, and potential mining activities. The extent to which these negative externalities will be reduced by Morice LRMP management direction should be set against the raw NEV cost implications. While we have been unable to quantify either the base case level of these externalities, or the extent of their potential amelioration through LRMP initiatives, the benefits noted to other sectors and interests, as well as environmental values reflect at least some of this amelioration effect.

Communities

- The plan enhances tourism and recreation values, which should support the marketability and strategic diversification initiatives of Houston, Granisle and other plan area communities. Community capacity building, local empowerment, resource inventory information and stakeholder consensus are key benefits of the planning process.
- The communities in the Morice LRMP area may avoid some of the costs associated with any decline in plan area forest activity, as the two major wood products mills based in Houston are among the largest, most efficient in the province and may replace some or all of this plan area volume with timber drawn from other areas.

First Nations

The Morice LRMP will facilitate First Nations economic development strategies in the forest sector, eco-cultural tourism, botanical forest products and backcountry adventure tourism. First Nations will benefit through the protection of cultural heritage resources, as well as any incremental benefits to fish and wildlife populations, water quality, and culturally significant ecosystems.

Environmental Values

The Morice LRMP is expected to reduce levels of risk of serious adverse impacts to many environmental values, compared to base case management.

- Regional ecosystem representation in Protected Areas and No Timber Harvest areas will be enhanced for some ecosections and biogeoclimatic zones, although some of those which are less represented in the base case will not receive significant additional representation under the Morice LRMP.

- As shown below, the risk of serious adverse impacts from industrial and recreation activities is

expected to be reduced by at least one rating category for several environmental values including ecosystem representation, coarse filter biodiversity, some mountain goat populations, riparian ecosystems, rare ecosystems and aquatic ecosystems. For other focal species the benefits of the LRMP are not expected to be sufficient to result in a change in risk profile.

Environmental Risk Assessment[4]

Ecological Objective Category	Base Case Risk Level	Morice LRMP Risk Level
Ecosystem Representation	High Risk	Moderate to High Risk
Coarse Filter Biodiversity	High in Areas developed for forestry	Moderate to High in areas developed for forestry
Focal Species		
Grizzly Bear	High in roaded areas; Low to Moderate in unroaded areas	High in roaded areas; Low to Moderate in unroaded areas*
Northern Caribou	Uncertain; depends mostly on predation	Uncertain; depends mostly on predation
Fisher	Uncertain; lack of information on local populations	Uncertain; lack of information on local populations
Northern Goshawk	Moderate to High	Moderate to High
Mountain Goat	Low for most populations; Moderate to High for small isolated populations	Low for most populations; Moderate for small isolated populations
Moose	Low	Low
Marten	Low to Moderate	Low to Moderate*
Bull Trout	Uncertain	Uncertain*
Riparian Ecosystems	Uncertain	Low to Moderate
Rare Ecosystems	High	Moderate
Aquatic Ecosystems and Fish Habitat	Uncertain	Low to Moderate

* = small improvement in risk level but not sufficient to alter rating

= significant improvement in risk level

The following two tables present the key elements of the plan and their impacts on each sector, interest group or value. The first table summarizes subjective assessments of the LRMP's impacts compared with the base case in terms of the nature and size of the net benefits and costs of the different components of the LRMP (listed down the left hand side) on the different industry sectors, social values and environmental values (listed across the top). The second table presents a more quantitative perspective on expected impacts at a similar level of detail.

Section 7 contains a detailed tabular summary of the environmental risk assessment.
Section 8 contains more detailed tabular summaries of the key features of the LRMP along with its socio-economic and environmental impacts on industry sectors, social values and environmental values.

[4] Note that the original 2004 ERA, the updated ERA in Appendix D and these risk assessments do not consider the impact of the subsequent accelerated Mountain Pine Beetle (MPB) infestation.

Summary of Subjective Socio-Economic and Environmental Assessment

Morice LRMP Socio-Economic and Environmental Impact Assessment

(relative to Base Case or 'status quo' management scenario)

		Forestry	Mining	Agriculture	Energy	Guiding/Trapping	Botanicals	Tourism	Recreation	Communities	First Nations	Ecosystem Representation	Coarse Filter Biodiversity	Focal Wildlife Species	Special and Rare Ecosystems	Aquatic Ecosystems and Fish
General Plan and Planning Process Products	land use certainty, resource inventory data and maps, community capacity building, stakeholder consensus, First Nations engagement	b	b	b		b	b	b	b	b	b	b	b	b	b	b
General Management Direction	Management Objectives															
Consultation	consistency of operational decisions with LRMP direction	b/c	b/c	b	b/c	b	b	b	b	b	b/c					
Community	air quality, community stability, heritage, recreation, visual	c	c			b		b	b	b	b	b	b	b		
Economy	access management, specific sectoral objectives	c	b/c	b		b	b	b	b	b/c	b		b			
Ecosystem	biodiversity, fish and wildlife, aquatic resources	C	c	b/c	c	b	b	b/c	b/c		b	b	B	b	B	B
Other	noxious weeds, fertilizer use, point source pollution	b/c		b/c			b	b/c	b/c							
	Management Objectives															
Protected Areas	recreation, ecological, tourism, cultural heritage values	c	c			b	b	b/c	b/c		b	B	b	b	b	b
Area Specific Management	Management Objectives															
No Timber Harvest Areas	recreation, ecological, tourism, cultural heritage, water resources	c	c			b	b	b	b		b	B	b	b	B	B
Other Area Specific	recreation, ecological, tourism, cultural heritage, water resources	C	c	c		b	b	b	b		b	b	b	b	b	b

Legend: c = modest costs, C = significant costs, b = modest benefits, B = significant benefits, and b/c = a mix of costs and benefits.

For an explanation of the methodology please refer to Section 8 of this report.

Summary of Morice LRMP Economic Base Case and SEEA

Economic Impacts	Base Case					Morice LRMP Impacts
	Direct PYs of Employment		Direct GDP ($ Million)	BC Direct Government Revenues ($ Million)	BC Net Economic Value ($ Million)	
	Morice LRMP Area	BC				
Sectoral Data:						• Certainty benefits • Net economic value loss equivalent to $3 million per year plus potentially $1 million in additional harvesting costs; • No jobs lost in decade 1;. Over 6 decades, an average loss of 112 direct PYs in forest sector
Forestry (AAC excl. Woodlots)	1,018	1,442	$198.08	$68.25	$45.71	
Huckleberry Mine	82	215	$38.95	$1.90	$1.65	No impact
Agriculture	20	20	$0.89	$0.05	$0.06	B
Backcountry Tourism:						
Guide Outfitting	21	21	$0.64	$0.08	$0.16	B
Guided Angling	13	13	$0.94	$0.09	$0.19	B
Other Commercial Tourism	9	9	$0.38	$0.05	$0.05	B
	43	43	$1.96	$0.21	$0.41	
Other Industrial Sectors:						• Certainty benefits • Making 8.5% of Very High and High metallic mineral potential unavailable for exploration and development may translate to some loss of employment and net economic value in the long term
Mineral Exploration	• ARIS 1970-2005 expenditures: $1.9 million/yr ($2006); 4.3% of BC exploration expenditures					
Oil & Gas	• No existing activity - some potential					No impact
Hydro-electric	• Nechako reservoir system, potential run of river projects					c
Botanical Forest Products	• Limited existing activity - some potential					B
Trapping	• 62 territories; total average annual revenues of $90,000 for Morice LRMP area					B
Recreation Values	• Estimated 100,000 recreation days (RDs). Various estimates of $/RD: some around $50, others in the $10 to $20 range.				$1 to $5	B
Social and Environmental Impacts	Morice LRMP Impacts					
Community Sustainability/Resilience	• Impacts of employment declines (beginning in Decade 2) from decreased forest industry activity • Benefits to ecological integrity, civic vitality, economic diversity and recreation opportunities					B/C
First Nations	• Benefits to cultural heritage, botanical forest products, culturally significant ecosystems					B
Environmental Values	• Increased ecosystem representation in Protected Areas and No Timber Harvest areas • Reduced risk to coarse filter biodiversity in area developed for forestry • Reduced risk to some mountain goat populations, riparian ecosystems, rare ecosystems and aquatic ecosystems • Less significant benefits to grizzly bear, marten, moose, and bull trout					B

1 Introduction

The objective of this analysis is to provide an assessment of the expected socio-economic and environmental impacts of the Morice LRMP relative to benchmark scenarios (base case socio-economic assessment[5] and base case environmental risk assessment[6]), along with an assessment of the types and degrees of uncertainty involved in the analysis.

This introductory chapter provides:

- a description of the methodology for the SEEA;
- an overview of the Morice Plan Area Population and
- an overview of the key elements of the Morice LRMP.

1.1 Methodology

The BC Ministry of Agriculture and Lands (MAL) has prepared guidelines to direct assessment of the socio-economic and environmental impacts of land use and resource management planning in British Columbia[7]. This assessment is directed by, and is consistent with, those guidelines. The SEEA uses various concepts defined in the MAL Guidelines for SEEAs, including the "net resource value"[8] of the market and non-market outputs generated by plan area resources.

This SEEA draws from and builds on the SEEA of an earlier draft of the Morice LRMP referred to herein as the Table Recommended Plan [9]. This report is primarily concerned with the social and economic impacts associated with Morice LRMP management direction. The potential environmental impacts of the LRMP are briefly summarized in Section 7 of this report. A separate Environmental Risk Assessment (ERA) report[10] was prepared on the 2004 LRMP Table recommendations, and Appendix D of this report provides an update to that ERA taking into consideration adjustments in the final LRMP resulting from government-to–government

[5] Pacific Analytics Inc. et al., *Morice LRMP Base Case Socio-Economic Assessment*, prepared for MSRM Skeena Region, 2004.

[6] Edie, A.G., *Environmental Risk Assessment: Base Case Projection,* Ministry of Sustainable Resource Management, Smithers, B.C., 2004.

[7] B.C. Ministry of Agriculture and Lands (BC MAL), Strategic Land Policy Branch, *Land Use Planning and Resource Management Planning: Guidelines for Socio-Economic and Environmental Assessment (SEEA)*, draft, February 10, 2006.

[8] For commercial sectors, the net resource value (or economic rent) represents the above-normal financial returns from a commercial activity that occur as a result of the product or service generated by that activity being in relatively fixed supply relative to demand. Rent can accrue to the entrepreneur, be captured by the land and/or resource owner (government) or be incorporated in wages paid to labour. For non-commercial activities such as recreation and the benefits associated with environmental resources, the net benefits fall into two categories: use-related values (e.g. recreation, food gathering, air and fresh water) and existence-related values. Net economic value estimates should be net of any external costs or 'negative externalities' imposed upon third parties (e.g. environmental or social disturbances). Source: Ibid, pages 27 to 29.

[9] Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendation*, prepared for BC Ministry of Sustainable Resource Management Skeena Region, June 2004.

[10] Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June 2004.

negotiations. No attempt is made to assess the direct government or private costs associated with formulating, facilitating and implementing the LRMP.

The Socio-Economic Assessment is based on the following key data sources:

- **Publicly Available Data on Socio-Economic Indicators:** Extensive data were collected as part of the 2004 SEEA of the Table Recommended Plan and this 2007 assessment draws heavily from the 2004 report, with some updating to more recent data.

- **Geographic Information System (GIS) Data** (also referred to as **Area Statistics** throughout the report). This type of analysis uses mapped layers of key resource values and activities (e.g. timber harvesting land base, mineral potential, tourism uses, aboriginal values, etc.) and overlays this with the boundaries of the zones subject to specific resource management direction (e.g. Protected Areas, No Timber Harvesting zones, etc.) to determine the extent of the resource values and indicators lying in these zones. The MAL-ILMB government team provided the GIS data to *Pierce Lefebvre Consulting* who then tabulated the results.

  Detailed GIS analysis was conducted as part of the 2004 SEEA of the Table Recommended Plan. The GIS data were not entirely revised for this report as the changes for some resource values would generally not be significant in terms of resource value distribution across management area types.

- The **Morice Landscape Model** (MLM), a Spatially Explicit Landscape Event Simulation, or SELES model. Andrew Fall, of Gowlland Technologies developed and used the MLM to estimate the impacts of Morice LRMP management direction on the sustainable long term rate of timber harvest in the Morice LRMP area as well as to prepare projections of landscape conditions for use in the environmental impact assessment. Andrew Fall conducted an analysis of the 2004 Table Recommend Plan, and in January and February 2006, he completed a review of a land use option that very closely matches the final Morice LRMP. These 2006 results form the basis of the forest industry impact assessment for this SEEA. [11] In summer 2006, the forest industry impact results determined by Andrew Fall were further examined by the ILMB in light of some changes to the LRMP, and this subsequent analysis has been referred to where applicable.[12]

- **Various background and other reports** prepared for the Morice LRMP process and other uses; selected references are listed in Appendix E.

1.2 Overview of Morice Plan Area Population and Economy

The Morice LRMP area covers 1.5 million hectares of Northwestern BC and has a population of approximately 5,200 people. The major communities in the region include the District Municipality of Houston (population of 3,580), the Village of Granisle (population of 350) and unincorporated communities such as Topley, Topley Landing and Tatchet. Another 8,700 people reside in Smithers, Telkwa and Burns Lake, all within a one hour drive of Houston, bringing the regional population to approximately 14,000 people.

[11] Gowlland Technologies (Andrew Fall), *G2G Analysis*, prepared for the Morice LRMP: Government Technical Team, January 25, 2006; and Gowlland Technologies et al., *Morice LRMP: Government Technical Team, Government to Government Plan Analysis,* Feb. 20, 2006 pg. 7, Option 3.
[12] Burger, Hubert, BC MAL - ILMB, *Estimate of Timber Supply Impacts of Phase 2 of G2G Negotiations for the Morice LRMP Draft for Discussion*, July 12, 2006. (See Appendix A).

The Morice LRMP area is part of the Bulkley Nechako Regional District (BNRD), which includes approximately 41,000 people. Other communities in the BNRD include Fraser Lake, Fort St. James, Vanderhoof and various First Nations rural communities.

The Morice LRMP area population has dropped by 19% between 1981 and 2001, mainly as a result of the closure of the Granisle and Bell Copper mines. The Village of Granisle population dropped from 1,430 people in 1981 to 350 in 2001.

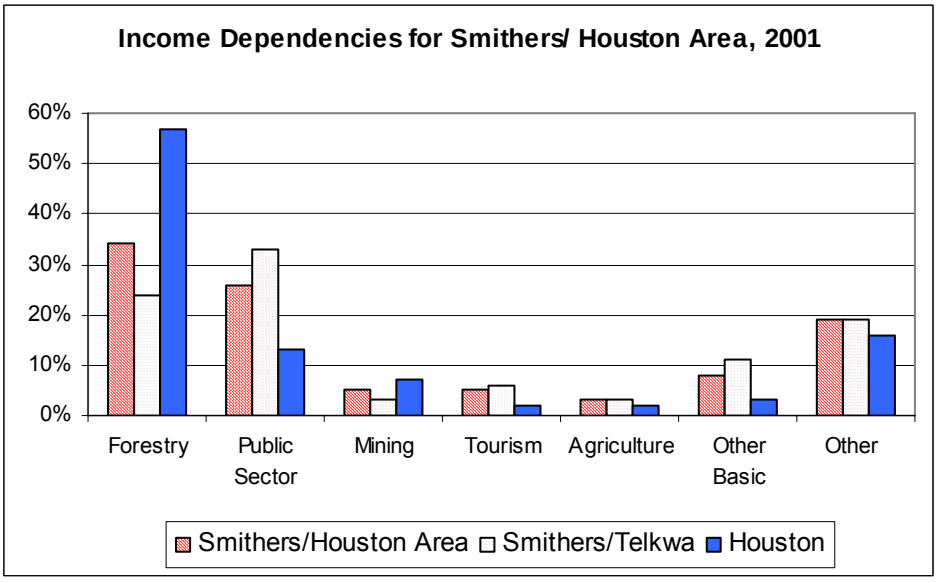
The forest industry is by far the dominant employer in the region accounting for 57% of basic after-tax income in Houston, 24% in Smithers/Telkwa, and 34% for the Smithers/Houston region. There are two major sawmills in Houston and a number of smaller remanufacturing plants.

The public sector is a major employer in the region particularly in Smithers/Telkwa where the public sector generates 33% of basic income.

Mining accounts for 7% of basic income in Houston and 5% of the Smithers-Houston region, with the Huckleberry Mine some 86 km southwest of Houston generating 215 person-years (PYs) of direct employment. Mining accounted for 9% of the region's total basic income in 1981, but the closures of two mines near Granisle led to the drop in income.

The tourism sector accounts for 2% of income in Houston and 5% of income in the Smithers/Houston region. Major activities include guide-outfitting, guided angling, backcountry lodges, boating, freshwater angling, snowmobiling, backcountry skiing and hiking. The outdoor recreation sector is very important, generating an estimated 100,000 recreation days per year (estimate includes mainly freshwater angling, hunting by BC residents, snowmobiling and a few other backcountry activities).

Chart 1 Percentage of Basic Income by Sector for Smithers/ Houston Area



Notes to Chart 1:

1. Represents the percentage of basic income in each major economic sector; basic income for each sector is defined as the direct, indirect and induced after tax income that depends on an independent sector such as forestry, mining and tourism. This analysis considers the public sector as a basic, independent sector.
2. Other basic income includes the high technology sector, construction, and other basic sector.
3. Other income includes transfer payments and non-employment income.

Source: Horne, Gary, *British Columbia's Heartland at the Dawn of the 21st Century, 2001 Economic Dependencies and Impact Ratios for 63 Local Areas,* BC Stats, 2004.

Agriculture and food accounts for 2% of income in Houston and the Morice LRMP area, and 3% of basic income in the Smithers/Houston region, mainly through cattle ranching activities, dairy and food manufacturing. Other sectors include botanical forest products and trapping.

There are five First Nations that have declared interests in traditional territories in the Morice LRMP area under the tripartite treaty negotiation process:

- The Office of the Wet'suwet'en, which represents over 5,000 people. Of these, 2,362 people were registered in 2002 under the Hagwilget Village or Moricetown groups. The Wet'suwet'en traditional territory claimed under the treaty negotiation process covers 74% of the Morice LRMP area, but there are no year-round Wet'suwet'en communities within the plan area.

- Lake Babine (Nat'oot'en), which has over 2,050 members. Most reside outside the Morice LRMP area, with the largest community on the Woyenne reserve near Burns Lake. The communities of Tatchet and Fort Babine are within or on the border of the Morice LRMP area. The Nedo'ats Hereditary Chiefs, one of several groups within the Lake Babine Nation, occupy the village of Old Fort on a seasonal basis.

- The Wet'suwet'en First Nation (Carrier-Sekani Tribal Council), which represents several member bands with a combined population of approximately 12,000 people; this includes the Burns Lake Indian Band (registered population of 88 people) and the Wet'suwet'en First Nation (208 registered Band members).

- Cheslatta Carrier Nation, which comprises some 286 registered band members centered on the south shore of Francois Lake, just outside the Morice LRMP boundaries.

- Yekooche First Nation, which has 175 registered band members (INAC 2002), most of whom reside on the shores of Stuart Lake to the east of the Morice LRMP area.

1.3 Key Elements of the Morice LRMP

The Morice LRMP includes the following elements:

- **Protected Areas**: The Protected Areas (PAs) represent 8.3% of the Morice LRMP area. They include the Kidprice Lake Chain PA (16,003 ha) that would protect a chain of lakes and rivers with particular recreation, tourism and ecological value; the Morice Lake PA (47,677 ha) surrounding Morice Lake, the Atna River PA (18,919 ha), the Burnie-Shea PA (33,613 ha) on the western boundary of the Morice LRMP area; various smaller marine parks along Babine Lake; and the Nadina Mountain and Old Man Lake areas southeast of Houston.

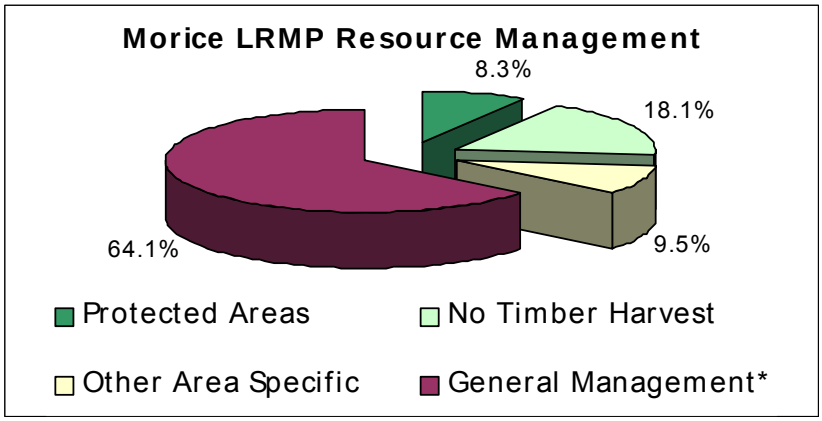
- **No Timber Harvest Areas:** A further 18.1% of the Morice LRMP area is excluded from timber harvest.

- **Other Area Specific Management:** The Morice LRMP provides area specific management direction focusing on recreation, tourism, cultural and ecological values on a further 9.5% of the Morice LRMP area.

- **General Management Direction:** The Morice LRMP provides general management direction (GMD) for the full spectrum of plan area resources, to be applied across the entire Morice LRMP area. The objectives of the GMD are to enhance the security of many of the area's key resource values, through the management of site specific features, access management, ecosystem management measures and consultation.

- **Morice Water Management Area:** A broad area (340,335 hectares) in the southwest portion of the plan area which overlaps many of the above noted resource management zones, focusing on maintaining water and salmon habitat quality in the Morice Lake, Nanika-Kidprice, Gosnell, Thautil and Starr Creek watershed systems.

Chart 2 Resource Management Zones – Morice Final Land Use Plan



* In this chart, the General Management category includes private lands, which are not subject to LRMP management.

Chart 3 Map of Morice Final Land Use Plan - Resource Management Zones

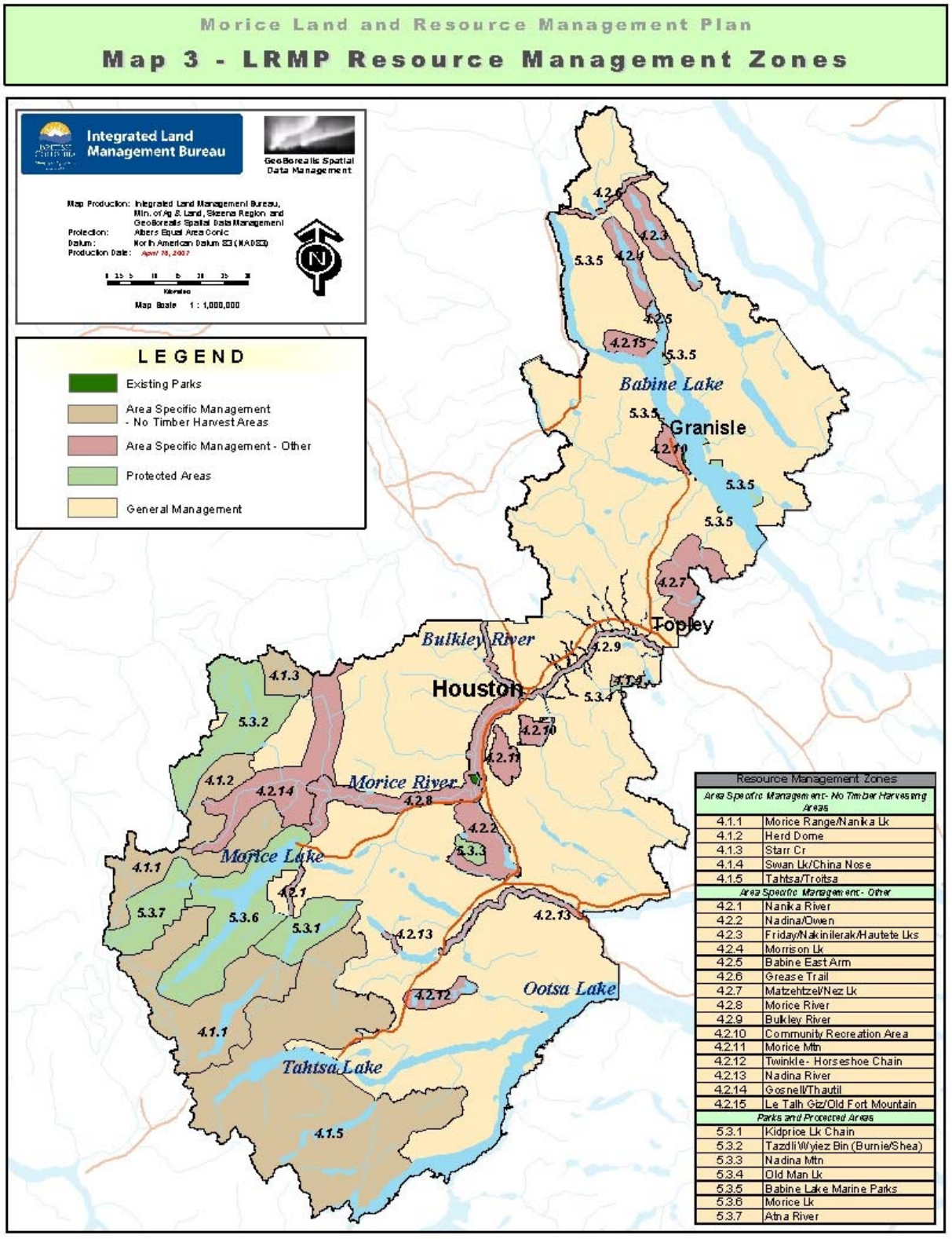
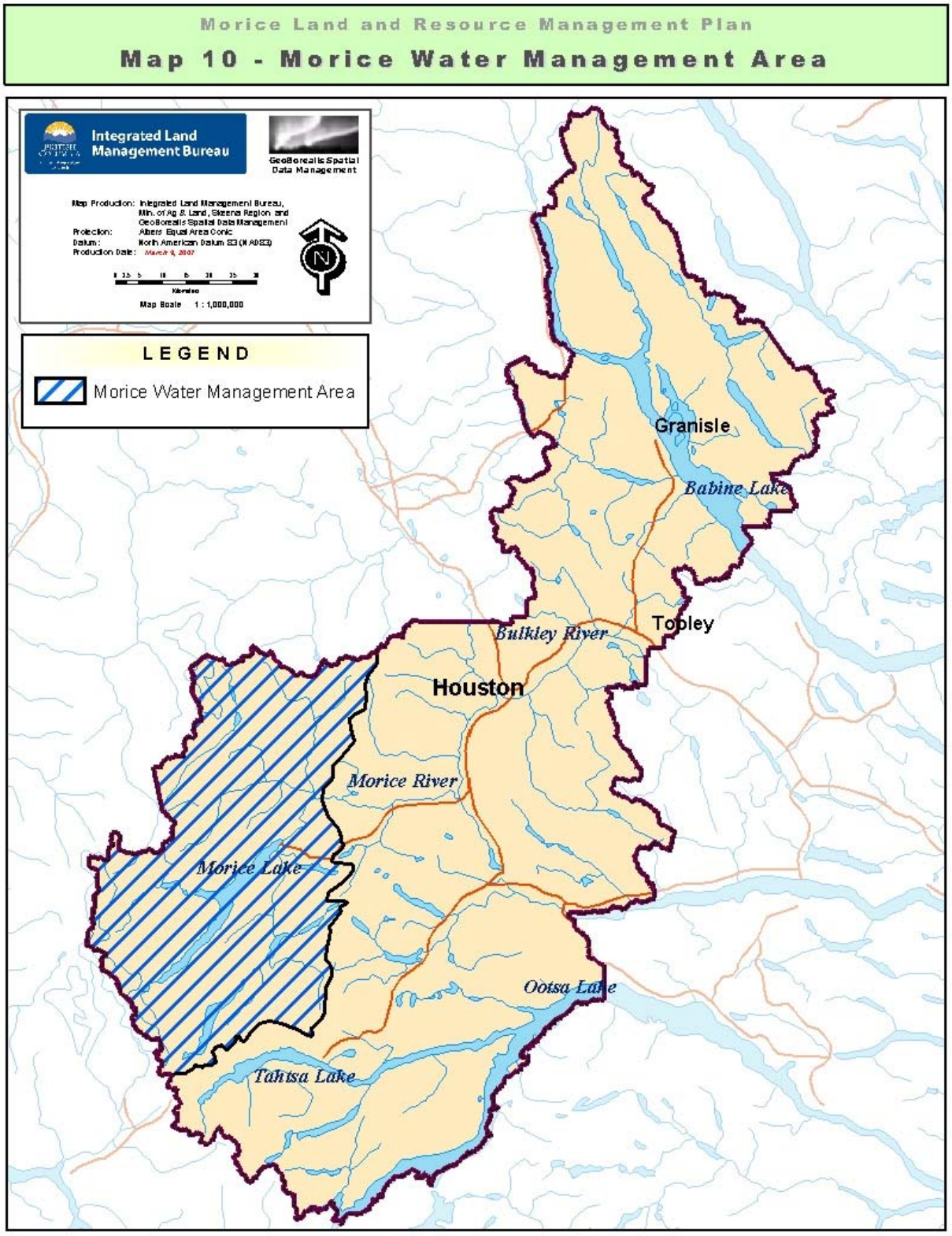


Chart 4 Map of Morice Final Land Use Plan – Water Management Area



2 Primary Industrial Sector Implications

The following sections summarize the key socio-economic impacts of the Morice LRMP building on the 2004 SEEA document that reviewed the impacts of a draft version of the plan.[13]

2.1 Forestry[14]

2.1.1 Forest Industry Overview

The forest industry accounts for 34% of basic sector income in the Smithers/Houston area (57% of basic sector income if only Houston is considered, and 56% for the Morice LRMP area) and is by far the dominant employer in the region. The two major wood products mills in Houston are the Canadian Forest Products (Canfor) facility, with an annual output capacity of 600 million board feet of lumber (one of the largest softwood lumber mills in Canada), and West Fraser Timber's Houston Forest Products (HFP) facility, with an annual output capacity of 339 million board feet of lumber (also one of the 6 largest sawmills in the province).

The Allowable Annual Cut (AAC) for the Morice LRMP area (the Morice Timber Supply Area) is 1,961,117 m^3 of timber, excluding woodlots, which in 2003 comprised an additional 47,009 m^3. [15] Taking into account the latest upgrade at the Canfor mill, the two large sawmills based in Houston can process some 3 million m^3 of timber, or 53% more wood than is harvested in the Morice LRMP area each year. The centralized primary processing operations in Houston create wood by-products that supply other types of wood processing operations in the region. Mills that depend on fibre and by-products from the Houston sawmills include some local remanufacturing plants (trim ends and lumber), a local wood fuel pellet plant, a particle board plant in Smithers (sawdust), the Eurocan pulp and paper plant in Kitimat (wood chips) and the Canfor pulp and paper mills in Prince George (wood chips).

Timber harvested in the Morice LRMP area (Morice TSA) generates an estimated 0.74 person-years (PYs) of direct employment in Northern BC per 1,000 m^3 harvested, or an estimated 1,442 person-years of direct employment (based on a 1,961,117 m^3 AAC). The latest expansion/upgrade of the Canadian Forest Products mill in Houston has reduced the employment coefficient per m^3 of wood processed at the mill, but while employment at primary facilities has dropped, changes in trim block processing and wood waste utilization provide additional value added opportunities.

Timber resources in the Morice TSA are provincially significant. While the Morice LRMP area accounts for 1.6% of the land area in BC, it accounts for 3% of the provincial Timber Harvesting

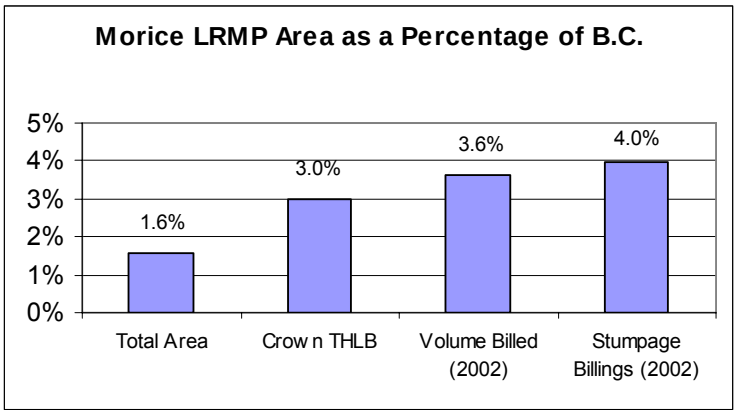
[13] Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, prepared for BC Ministry of Sustainable Resource Management Skeena Region, June 2004.

[14] Base Case conditions with respect to the rate of mountain pine beetle infestation have altered (infestation is proceeding more rapidly than anticipated) since 2004 and the timing of impacts expected from the Morice LRMP may be significantly different than discussed in this report due to government and industry responses to the accelerating infestation in both the Morice plan area and surrounding timber supply areas.

[15] Pacific Analytics Inc. et al., *Morice LRMP Base Case Socio-Economic Assessment*, 2004, page 29.

Land Base (THLB), 3.6% of volumes billed (2002) and 4% of provincial stumpage revenues.

Chart 5 Morice LRMP Area Contribution to BC Forest Sector



Note:
The Morice LRMP Area as a % of BC's Total Area is based on the Plan Area covering 1.5 million hectares and a total BC area of 94.7 million hectares.
Source:
1. Crown Timber Harvesting Land Base (THLB): BC Ministry of Forests, *A Working Forest for BC*, 2001; Morice LRMP Area: BC MAL Area Statistics, August 2006, as per Appendix C.
2. Stumpage Revenues and Billed Volumes: BC Ministry of Forests, Revenue Branch, *Summary of Volumes and Average Stumpage Rates*, 2002; MOFR website, March 24th, 2004.

The Morice TSA timber harvest has generated annual provincial government stumpage revenues ranging between $34 million and $53 million from 2000 to 2005 (constant $2005), as well as annual royalties, direct corporate taxes and provincial income taxes derived from direct employment of some $27 million[16]. The base case assumption is $68.3 million[17] in total provincial government revenues going forward under base case management.

The forecast net economic value from the Morice LRMP area forest sector is estimated at $45.7 million per year or $23.30 per m^3 (based on 1.961 million m^3 harvest). The net economic value estimate assumes that the net economic rent to the Crown is approximately equal to stumpage values, that labour rents are 5% of wages and salaries for direct employment, and that there are no economic rents to capital in the industry. This net economic value accounting is incomplete, however, as it does not include consideration of negative externalities arising from forest industry activity such as the impact of timber harvesting on wildlife. Appendix B provides more detail on the Morice LRMP forest sector.

The most recent timber supply review by the Chief Forester (October 2002[18]) indicated that the Morice TSA timber harvest can continue at the current AAC level (1,961,000 m^3) for 4 decades

[16] Based on base case estimates of provincial income taxes paid by direct employees and forest industry taxes totaling $12.80 per m^3 harvested, and an annual average harvest of 2,126,000 m^3 between 2000 and 2005.
[17] Calculated from six year average stumpage rate ($23.23 per m^3) adjusted downward for Mountain Pine Beetle impacts to $22 per m^3, assumed first decade harvest of 1,961,117 m^3, provincial income taxes of $5.35 per m^3 and other forest industry taxes of $7.45 per m^3. Appendix B provides more detail.
[18] B.C. Ministry of Forests Chief Forester, *Morice Timber Supply Area Rationale for Allowable Annual Cut (AAC) Determination*, October 1, 2002. (Since this report was prepared in February 2007, the Chief Forester has issued a new AAC determination for the Morice TSA effective February 1, 2008. See next footnote but one).

before declining 8.1% to the long term harvest level in the fifth decade of the projection. The Morice TSA AAC is scheduled to be reviewed in 2007, and a major factor for consideration in that review will be the expanding mountain pine beetle (MPB) infestation. There may be a need to significantly alter the timber harvest flow pattern over the next several decades to contain advancement of the epidemic and address wide spread mortality of pine timber stands.

The Morice and Lakes Innovative Forestry Practices Agreement (M&L IFPA) participants have recently submitted an application to the BC Ministry of Forests and Range (MOFR)[19] for an AAC uplift to implement a mountain pine beetle strategy and to address various innovative forestry practice proposals. The requested AAC uplift averages some 1 million m^3 per annum over the next ten years (500,000 m^3 to be apportioned to IFPA licensees) primarily in respect of a proposed MPB strategy[20].

2.1.2 LRMP Resource Management Zones and Timber Harvesting Land Base

The Morice LRMP establishes area specific management zones including Protected Areas, Timber Harvest Exclusion Areas and other zones that give specific consideration to non-timber values provided by the land base. The following table outlines the distribution of timber values across these newly created zones.

Table 1 Distribution of THLB Across Morice LRMP Management Zones

Morice LRMP	Total Plan Area		THLB (TSR2)	
	(ha)	(%)	(ha)	(%)
Timber Harvest Exclusions:				
Parks and Protected Areas	125,055	8.3%	17,926	2.6%
No Timber Harvest Areas	271,610	18.1%	7,243	1.0%
Sub-total	396,665	26.4%	25,169	3.6%
Timber Harvesting Permitted:				
Other Area Specific Mgmt	141,732	9.4%	82,219	11.9%
General Management & Private	963,266	64.1%	586,373	84.5%
Total Area	1,501,663	100.0%	693,762	100.0%

Source: BC MAL GIS data, August 2006, as per Appendix C.

The above area statistics indicate that 26.4% of the Morice LRMP area is either Protected Area or is subject to Area Specific Management that prohibits timber harvesting. These new Protected Areas and No Timber Harvest areas will reduce by 3.6% the area of land considered by the most recent timber supply review (2002) to contribute to the timber harvesting land base (THLB)[21]. In addition, 11.9% of the THLB is located in areas with particular management emphasis on non-timber values (recreation, cultural heritage or other ecological values).

[19] Morice and Lakes Innovative Forestry Practices Agreement, *Morice and Lakes IFPA Forestry Plan*, January 17, 2007. The Morice & Lakes IFPA licensees were ultimately granted an increase in allowable harvest by the regional manager for the Northern Interior Forest Region of 200,000 m3 per year. The increase is based on the expected productivity gains from innovative silviculture practices.

[20] Since this report was prepared in February 2007, the Chief Forester has issued a new AAC determination for the Morice TSA of 2,165,000 m^3, effective February 1, 2008. This is an "administrative" increase of 10.4% to deal with changes in provincial log grades and billings. It takes account of the land-base reductions resulting from the Morice LRMP.

[21] See previous footnote.

2.1.3 LRMP Benefits to the Forest Sector

The benefits to the forest industry of the Morice LRMP can be assessed only qualitatively. They include greater land use certainty, potentially faster approval of forest development plans, support for product certification initiatives, and improved communication lines with community stakeholder groups and First Nations.

The Base Case socio-economic assessment[22] does not document any general or specific concerns with respect to land use uncertainty, land use conflict or product acceptance in the discussion of forestry in the Morice LRMP area (although there are some references to potential conflict between timber harvesting and tourism operations, and timber harvesting and agriculture[23]).

A review of the BC Forest Practices Board web site revealed two formal complaint investigations involving forest development plan impacts on non-timber values in the Morice LRMP area. One case involved the environmental impacts of a bridge improving public access from the Fort St. James forest district to the east side of Babine Lake[24], and the other involved conflicts between timber harvesting plans and a fishing lodge operation near Morrison Arm[25]. In the second of these cases, the lack of a Morice LRMP to guide forest development plan approval was noted in the Forest Practices Board's commentary[26].

During the public review process for TSR-2, The Office of the Wet'suwet'en expressed concern that continuing timber harvesting within Wet'suwet'en territories, particularly at low elevation, is significantly affecting Wet'suwet'en culture.[27]

Representatives for all of the above noted interests participated in the development of the Morice LRMP, which includes provisions to diminish the extent of existing or potential future conflict between timber harvesting and these other values.

Canadian Forest Products Ltd. (Canfor) and Houston Forest Products (HFP) have both pursued and achieved various forest harvesting certification standards, and continue to pursue others (Canfor and HFP are two of the partners in the Morice and Lakes Innovative Forest Practices Agreement which produced a Sustainable Forest Management Plan certified by the Canadian Standards Association). The effort and cost involved in achieving certification indicates that the forest harvesting licensees expect certification to be beneficial. The development of the Morice LRMP supports certification initiatives by providing strategic guidance (developed by a broader cross-section of stakeholders) to Sustainable Forest Management Planning, and by contributing to documentation of the spatial occurrence of resource values on the landscape.

[22] Pacific Analytics Inc. et al., *Morice LRMP Base Case Socio-Economic Assessment*, 2004, page 26 to 41.
[23] Ibid, pages 56 and 71.
[24] Forest Practices Board, *Effects of the MacDougall Creek Bridge on Access to the East Side of Babine Lake*, Complaint Investigation 000280, April 2002.
[25] Forest Practices Board, *Timber Harvesting and Fishing Lodge Interests near Morrison Arm*, Complaint Investigation 000284, January 2002.
[26] Ibid, page 9.
[27] BC Ministry of Forests, *Morice Timber Supply Area Timber Supply Review, Summary of Public Input,* September 2002, pg.7.

2.1.4 Potential Timber Supply Volume Impacts of the LRMP

The 2002 Ministry of Forests Timber Supply Review (TSR2) base case timber supply projection for the Morice TSA projected that the current AAC of 1.96 million m^3 could be maintained for 4 decades before declining by 8.1% in the fifth decade to the Long Term Harvest Level of 1.80 million m^3 (referred to hereafter as the 'falldown'). This projection is the benchmark against which the impacts of the Morice LRMP are estimated in the following analysis. It should be noted that events subsequent to TSR2, particularly the accelerating spread of mountain pine beetle infestation, are likely to have a very significant influence on any updated timber supply projections over the short to medium term (the next 50 years). For example, the Morice and Lakes Innovative Forestry Practices Agreement (M&L IFPA) participants have very recently developed a Forestry Plan[28] for the Morice TSA which indicates that an increased rate of harvest over the next 10 years (relative to the TSR2 projection) may be necessary to avoid a very steep decline in harvest levels in the period 10 to 25 years from now, due to pine stand mortality[29].

To assist in the analysis of potential LRMP impacts on timber harvesting in the plan area, a suite of Spatially Explicit Landscape Event Simulator (SELES) tools was utilized by the Morice LRMP Government Technical Team to construct a Morice Landscape Model (MLM)[30]. This spatially explicit model identifies the Timber Harvesting Land Base (THLB) at a one square hectare resolution, and tracks several attributes associated with forest cover, operability, management zones, roads, etc. The model can be used to examine the impacts on the sustainable rate of timber harvest, of most of the significant land use and forest management initiatives contained in the Morice LRMP.

General Timber Supply Impacts

Timber supply analysis using the MLM, undertaken by Gowlland Technologies[31] and reviewed by the BC MOFR, indicates that relative to the TSR2 base case the sustainable rate of timber harvest would decline by 7.4% to accommodate the Morice LRMP (an average of 152,000 m^3/year over the first 6 decades and 133,000 m^3/year thereafter). This includes:

- 1.9% due to the THLB reduction for proposed Parks, Protected Areas, and No Timber Harvesting Areas; and
- 5.5% related to the management direction for Crown forest lands where timber harvesting is permitted, including approximately 1.0% in respect of potential THLB reduction for agricultural land expansion.

If the only changes to the TRS2 Base Case timber supply model (as simulated by the MLM) are the exclusion of THLB in the Protected Areas and No Timber Harvesting areas (3.7% of THLB)[32], the resulting adjustment required to long term harvest levels is a decline of 1.9% from Base Case

[28] Morice and Lakes Innovative Forestry Practices Agreement, *Morice and Lakes IFPA Forestry Plan*, January 17, 2007, pg 11.
[29] See footnotes 19 and 20.
[30] Gowlland Technologies et al., *Morice Landscape Model*, December 2, 2003.
[31] Gowlland Technologies (Andrew Fall), *Final Plan Analysis*, Morice LRMP: Government Technical Team, May 5, 2004; and *Morice LRMP: Government Technical Team, Government to Government Plan Analysis,* Feb. 20, 2006.
[32] The amount of THLB in Morice LRMP harvest exclusion areas (3.7%) is taken from the Morice Landscape Model simulations in May 2004 and is slightly different from the THLB exclusion indicated by the 2007 GIS Area Statistics (3.6%). There were some very small alterations to the THLB areas excluded as a result of government-to-government (G2G) discussions subsequent to the 2004 table recommended plan (See Appendix A).

levels. The indicated impact on the long term harvest level from THLB exclusions is about half of what might be expected if the impacts were directly proportional to the amount of THLB being excluded. This is a reflection of the generally lower than average productivity of the THLB lands being excluded[33], as well as issues of access and rotation timing for many of the excluded sites.

Management direction that may have impacts on timber supply, but that was not simulated in the MLM includes natural succession pathway requirements for biodiversity, cultural heritage and culturally significant ecosystem management, and management for botanical forest products. The significance of these additional impacts is very difficult to gauge, as the interactions between overlapping forest harvesting constraints are complex, and the LRMP management direction allows some latitude in the interpretation and implementation of these management guidelines.

The 7.4% downward pressure on long term timber harvest volume estimated by the MLM results both from timber harvesting land base exclusions (Protected Areas and No Timber Harvest areas), and lower intensity harvesting to accommodate other management initiatives in the LRMP. The degree of uncertainty inherent in the harvest level impact estimate is quite different for each of these two types of impacts.

THLB exclusions are relatively straightforward to model, and the associated timber supply impacts are not amenable to mitigation through careful management or implementation strategies. This is not the case with most of the other management direction in the Morice LRMP. The MLM attempts to simulate as much of the management direction in the Plan as possible, but the simulation process for many of the management objectives involves making assumptions about how the management direction will be implemented, and devising simulation algorithms that best mimic the assumed management practices. There is significant potential for the actual impacts of these initiatives to be different than what is estimated by the MLM, given innovative management and implementation strategies. The planning table committed to examining implementation approaches that minimize costs and impacts.

While the MLM can provide a good indication of the influence of the Morice LRMP on the sustainable rate of long term timber harvest in the Morice TSA, it cannot determine or predict any action that may be taken by the Chief Forester in establishing the future AAC for the Morice TSA (the next timber supply review is currently scheduled for 2007). An AAC determination results from consideration of many factors and influences, including potential socio-economic impacts of changes to AAC.[34]

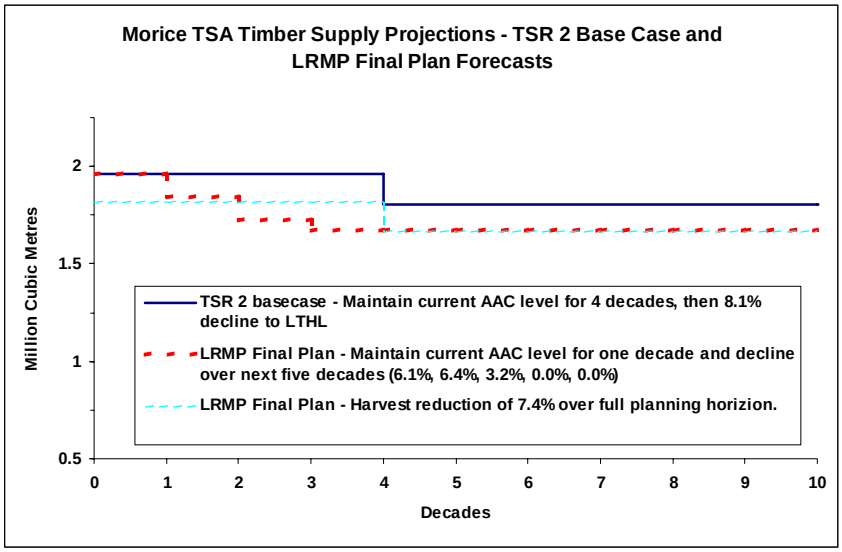
Timing of Timber Supply Impacts[35]

Timber harvest modelling simulations[36] indicate a 7.4% decline in annual long term harvest levels attributable to management proposed by the Morice LRMP would be required. Applying MOFR

[33] Of the THLB lands being excluded, 64% is in less productive Englemann Spruce-Subalpine Fir types.
[34] See BC Ministry of Forests, Morice *Timber Supply Area; Rationale for Allowable Annual Cut (AAC) Determination*, October 1, 2002 for a complete discussion of factors considered in that AAC determination for the Morice TSA. (See also footnote 20).
[35] Note that these projections do not consider potential impacts of the mountain pine beetle infestation or associated mitigation strategies.
[36] Gowlland Technologies et al., *Morice LRMP: Government Technical Team, Government to Government Plan Analysis,* Feb. 20, 2006 pg. 7, Option 3.

harvest flow policy[37] to the downward pressure on timber supply would allow the current AAC to be maintained for the first decade, before beginning a series of stepdowns to a long term level in decade 4 which is 14.8% below the current level and 7.4% below the TSR2 long term level.

Chart 6 Morice TSA Timber Supply Projections (TSR2 Base Case and Morice LRMP)[38]



Source: Gowlland Technologies et al., *Morice LRMP Government Technical Team, Government to Government Plan Analysis,* Feb. 20, 2006, pg. 7, Option 3.

It is likely that the magnitude of any AAC response to the MPB epidemic will be far greater in the short and medium term than any changes in AAC by the Chief Forester in consideration of the Morice LRMP. It is also likely that policies derived from the BC Government's MPB Action Plan[39] will modify the application of MOFR harvest flow policy to any downward pressure on AAC created by the Morice LRMP. The estimated potential socio-economic impacts of reduced timber harvesting activity associated with the Morice LRMP that follow, are based purely on the modelled impacts of the LRMP in isolation of any MPB Action Plan initiatives.

2.1.5 Socio-Economic Impacts Associated with Reduced Timber Harvest Flows

The AAC in the Morice LRMP area (Morice TSA) has been fully utilized over the past several years, and any downward revision in AAC relative to the base case, is likely to result in a reduction in forest industry activity both inside and outside the plan area. A reduction in harvest flows for the Morice TSA could result in declines in provincial employment, government revenues

[37] MOFR modelling policy requires the current AAC to be maintained for as long as possible (to minimize short-term impacts), while limiting the harvest declines between decades to less than 10%, and maintaining the harvest level always at or above the long-term level (so that short and medium term management do not compromise long-term yields).

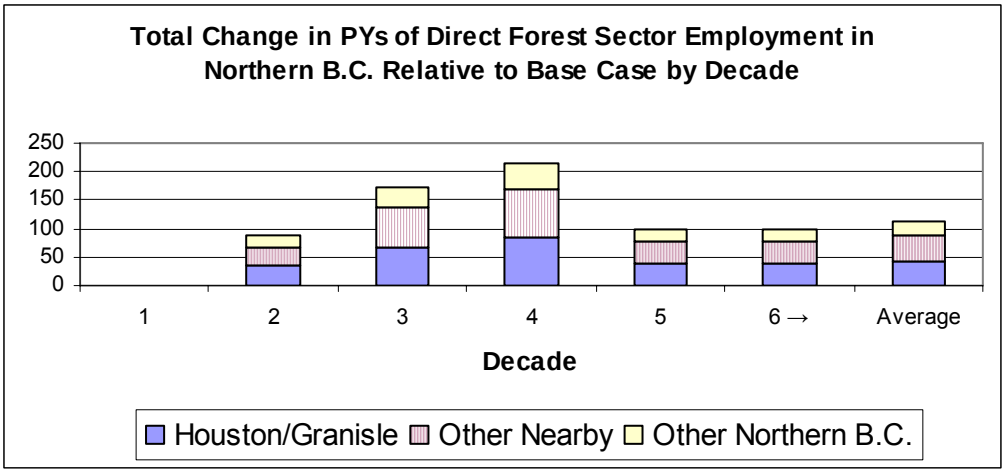
[38] Note that these projections do not consider potential impacts of the mountain pine beetle infestation or associated mitigation strategies.

[39] Government of British Columbia, *Mountain Pine Beetle Action Plan 2006-2011,* available at http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/actionplan/2006/Beetle_Action_Plan.pdf

and net economic value as outlined in the following chart and table.[40]

Following the projected timber supply impact pattern of the Morice LRMP, relative to base case projections, the direct forest sector job impacts would range from 0 person-years (PYs) of employment in the first decade to 214 PYs in the fourth decade. Under that harvest flow policy scenario, for the first 6 decades, an average of 112 direct forest industry PYs would be at risk, and 98 PYs thereafter.

Chart 7 Decline in Direct Forest Sector Employment – Morice LRMP Versus Base Case



Stumpage collected by the provincial government on timber harvested in the Morice TSA has averaged $23.23 per m^3 (constant $2005) over the past six years (2000 – 2005)[41]. This average has been influenced to some degree by the beetle killed pine component of the harvest in recent years, and it is expected that this influence will amplify over the next 10 years. For the purposes of estimating potential future impacts on stumpage revenues of the Morice LRMP, the past six year average rate of $23.23 per m^3 has been adjusted downward and rounded to $22.00 per m^3 in consideration of an increasing lower valued pine component in near future timber harvests. It should be noted that average stumpage rates fluctuate substantially from year to year, and any future projection of stumpage rates entails a high degree of uncertainty, and hence a wide margin of error.

The potential timber supply volume impacts of the Morice LRMP by decade, along with associated employment, stumpage and net economic value impact estimates are demonstrated in the following table.

[40] Assumes a linear and concurrent relationship with timber harvesting. See Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, prepared for BC Ministry of Sustainable Resource Management Skeena Region, June 2004, Appendix 2, for more detail.

[41] See Appendix B for details.

Table 2 Socio-Economic Impacts Associated with a Decline in Morice TSA Harvest Flows

Decade	1	2	3	4	5	6 and thereafter	6 Decade Annual Average	Annuity Equivalent @ 3%
Harvest ('000 m³)								
Base Case TSR2	1,961	1,961	1,961	1,961	1,803	1,803	1,908	
Morice LRMP	1,961	1,842	1,725	1,670	1,670	1,670	1,756	
Harvest Reduction ('000 m³)								
Morice LRMP Total Harvest Reduction	0	119	236	291	133	133	152	
Change Relative to Base Case:								
Morice LRMP Total Harvest Reduction	0.0%	6.1%	12.0%	14.8%	7.4%	7.4%	8.0%	
Decade to Decade Change	0.0%	6.1%	6.4%	3.2%	0.0%	0.0%		
Direct Employment Reduction (PY)								
Morice LRMP Decade to Decade Change	0	88	86	40	0	0		
Total Change Relative to Base Case:								
Total Morice LRMP Impact	0	88	174	214	98	98	112	
Direct, Indirect & Induced Employment Reduction (PY)								
Direct Employment Reduction	0	88	174	214	98	98	112	
Indirect & Induced Employment Reduction	0	104	207	255	117	117	133	
Total Employment Reduction	0	192	380	469	214	214	245	
Reduction in Stumpage ($mil./year) @ $22.00 per m³								
Total Morice LRMP Impact	$0.0	$2.6	$5.2	$6.4	$2.9	$2.9	$3.3	$2.8
Loss of Net Economic Value @$23.30/m³								
Total Morice LRMP Impact	$0.0	$2.8	$5.5	$6.8	$3.1	$3.1	$3.5	$3.0

Source for Table 2:

- Harvest Flows: Gowlland Technologies (Andrew Fall), G2G Analysis, prepared for the Morice LRMP: Government Technical Team, January 25, 2006.
- SEA data except for stumpage: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendation*, prepared for BC Ministry of Sustainable Resource Management Skeena Region, June 2004, page 15.
- Stumpage data: based on BC MOFR data. Appendix B provides more detail.
- Net Economic Value is a combination of rents to the resource owner (stumpage), rents to capital and rents to labour. Not included are offsetting negative externalities resulting from timber harvesting impacts on non-timber forest values.

While it is likely that a reduction in AAC would impact jobs, government revenues and net economic value, it is unclear which operations are likely to be affected. Mills in the vicinity of the Morice LRMP area have a combined milling output capacity of 1.5 billion board feet of lumber, in addition to the 900 million board feet of lumber output capacity at the two sawmills in Houston. As noted earlier, the Canfor sawmill in Houston at 600 million board feet in annual output capacity, is one of the largest in North America. The Houston Forest Products sawmill is also a large sawmill, although it has half the capacity of the Canfor mill. By comparison, there are 5 sawmills nearby with annual capacities of less than 200 million board feet of lumber.

Any job losses in harvesting and silviculture would likely be felt mainly in Houston/Granisle (an average of 44 direct PYs over the first 6 decades), but job losses in processing would likely occur

in other nearby communities (an average of 68 PYs over the first 6 decades). After considering the indirect and induced impacts, the average loss of 44 direct PYs in Houston/Granisle might result in an average loss of approximately 57 direct, indirect and induced PYs in those communities over the first 6 decades of the projection. [42] The harvest flow policy scenario indicates that none of these job loses would occur in the first 10 years of the projection.

2.1.6 Potential Timber Supply Volume Impacts of Water Management Area

The Morice LRMP includes designation of a Water Management Area comprising 340,335 hectares to be managed to ensure that the habitat and water quality supporting salmon are unaffected by human activity. The management intent is to maintain salmon habitat and water quality in "reference condition" with respect to current levels of metals, temperature, sediments and peak flow. Timber harvesting and forest management activities could potentially affect water temperature, sediment levels and peak water flows.

A majority (72%)[43] of the proposed Water Management Area is precluded from timber harvesting under the Morice LRMP, either as proposed protected area or no-timber-harvesting area, and an additional 12% (including 30,135 hectares of THLB) lies within resource management zones with specific values identified for special consideration (including high value fish habitat). The remaining 16% (including 33,416 hectares of THLB) covers areas otherwise subject only to General Management Direction under the Morice LRMP, which may require special effort during forest management planning and timber harvesting activities to maintain the "reference condition" of salmon habitat and water quality.

A preliminary assessment of the potential impacts of the Water Management Area on timber supply by ILMB[44] provided the following observations:

- Maintaining reference water temperatures in the Water Management Area should not require impacts to timber supply volumes;
- Current guidelines for operating within riparian areas are sufficient to protect streams from increased sediment levels and changes in peak flows, and no timber supply volume impacts are anticipated from sediment and peak flow provisions associated with the Water Management Area; and
- There is uncertainty as to whether additional prescriptive measures for forestry operations will be required in respect of the Water Management Area. A brief examination of potential prescriptions such as longer harvest rotation ages or a higher number of harvest passes (moving from a 4 pass system to a 5 pass system) indicates a worst case timber supply volume impact of 0.5% in the 2nd decade, with smaller disruptions in the long term. This potential impact is a very small, highly uncertain future risk and is not carried forward through the timber supply impact analysis.

2.1.7 Potential Timber Harvesting Cost Impacts

The SEEA of Morice LRMP Table Final Land Use Recommendation suggested that implementation of the plan could increase timber harvesting costs (and thereby also reduce

[42] Section 4 (Assessment of Plan on Communities/Settlements) provides more detail.
[43] Source: GIS stats provided by BC MAL June 30, 2006.
[44] Burger, Hubert, BC MAL - ILMB, *Estimate of Timber Supply Impacts of Phase 2 of G2G Negotiations for the Morice LRMP Draft for Discussion*, July 12, 2006.

stumpage revenues) across the plan area by a roughly estimated $1 million per year ($0.48 per m^3 of timber harvest[45]), mostly in respect of landscape level biodiversity provisions and visual quality initiatives. Included in the $1 million estimate is approximately $140,000 or $0.07 per m^3 for general management direction (GMD) regarding fish and aquatic habitat as well as domestic watershed maintenance. It is not clear what, if any, incremental effort over and above the other management direction in the Morice LRMP would be required to fulfill the management objectives of the Water Management Area[46].

Summary of LRMP Implications for the Forest Sector

The Morice LRMP will provide benefits to the forest sector in the form of greater land use certainty, faster approval of forestry plans, support for product certification initiatives, and improved communication lines with community stakeholder groups.

The Morice LRMP excludes 3.6% of the existing THLB from timber harvesting activity, resulting in a 1.9% downward influence on the long term timber harvest rate. Adding impacts from Other Area Specific management direction, as well as the package of General Management Direction could lead to overall downward pressure on long term harvest levels of 7.4%.

Applying MOFR harvest flow policy to the downward pressure on timber supply indicates that the AAC can be maintained at the current level for one decade, before beginning a series of stepdowns to a long term level in decade 6 which is 14.9% below the current level, and 7.4% below the TSR2 long term level (TSR2 anticipated an 8.1% 'falldown' from the current AAC to the long term level in the fifth decade). Implementation of strategies to deal with the mountain pine beetle infestation are likely to greatly overshadow short and medium term harvest flow impacts from the Morice LRMP.

The stepdown in stumpage revenues over five decades, which would not begin until the second decade under the MOFR harvest flow policy scenario, is equivalent to a loss of $2.8 million per annum starting immediately and continuing indefinitely. Similarly, the equivalent loss in net economic value, in perpetuity, is $3.0 million per annum, consisting of the stumpage loss to the Crown and a further $0.2 million loss in rents to capital and labour.

An average of 112 direct forest industry jobs would be at risk over the first six decades of the harvest flow policy scenario, and 98 thereafter. Following the harvest flow scenario over the 6 decades, the direct job impacts would range from 0 in the first decade to 214 PYs in the fourth decade, relative to the base case projections.

Most of the job impacts of reduced timber harvesting activity would be felt within the Morice LRMP area, while most of the job impacts of reduced wood product manufacturing activity would not likely be felt in Houston but outside of the Morice LRMP area.

Forest licensees estimate that management direction in the Morice LRMP may lead to increased harvesting costs of about $0.50 per m^3 in the Morice TSA, or an additional decline in annual government stumpage revenues and net economic value of about $1 million per annum.

[45] Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, page 17.

[46] It is also not clear to what degree such costs, if they existed, would be reflected in the stumpage appraisal system.

2.2 Minerals

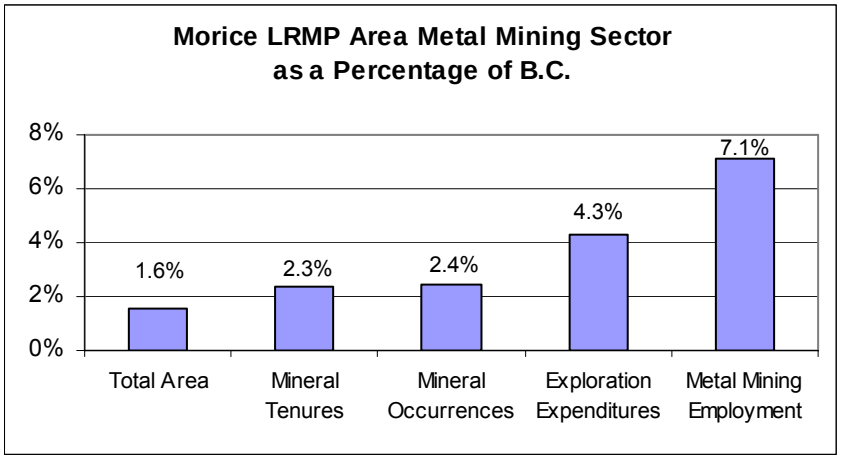
Mining and mineral exploration activities have been significant in the Morice LRMP area dating back to the turn of the 20th century. There are fourteen past producing metal mines in the Morice, including four major producers:

- Huckleberry Mine (1997 to present) located 86 km southwest of Houston employs approximately 230 people, of which 38% reside in the Morice LRMP area and 80% in the Bulkley Valley region. In 2002 it generated $39 million in annual Gross Domestic Product, $1.9 million in annual government revenues (including mining and other direct corporate taxes as well as employee income taxes), and $1.65 million in annual net economic value. Current economic reserves are sufficient to continue operations until 2010.

- Major past producing mines that are now closed include the Granisle mine (1966 to 1982), the Bell Copper mine also near Granisle (1972 to 1992) and the Equity Silver mine (1981 to 1994). A few employees remain for reclamation and other related work at these mine sites.

The Morice LRMP area metal mining sector is provincially significant, accounting for 2.4% of the province's metallic mineral occurrences (including 14 developed prospects) and 4.3% of provincial mineral exploration expenditures. Huckleberry Mine is one of 8 large metal mines currently operating in BC and accounts for 7.1% of BC's current employment in the metal mining sector.[47]

Chart 8 Morice LRMP Area Metal Mining Sector as a Percentage of BC.



Note:
The Morice LRMP Area as a % of BC's Total Area is based on the Plan Area covering 1.5 million hectares and a total BC area of 94.7 million hectares.
Source: Pierce Lefebvre Consulting *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendation*, prepared for BC Ministry of Sustainable Resource Management Skeena Region, June 2004, page 19.

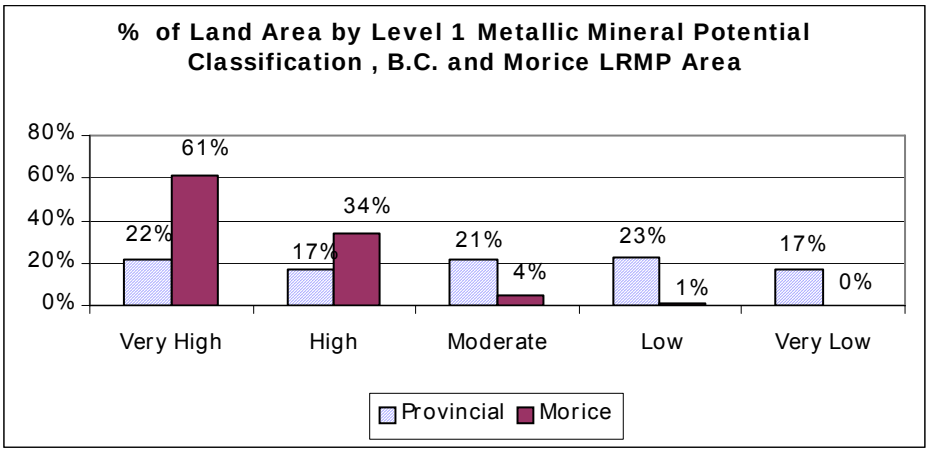
The BC Ministry of Energy, Mines and Petroleum Resources (MEMPR) has developed a system to identify and rank metallic mineral tracts in the province based on the estimated value per

[47] Based on the B.C. metal sector employing 3,012 people in 2001 (this excludes employment in coal, industrial minerals, mineral exploration and construction aggregates); source: B.C. Ministry of Energy and Mines website, accessed April 2004.

hectare of metallic mineral resources contained within each tract. The table below compares the rated potential of the tracts falling within the Morice LRMP area to all tracts in the province and yields the following observations:

- In the Morice LRMP area, approximately 61% of the lands are rated as having Very High metallic mineral potential and an additional 34% are rated as having High metallic mineral potential, and
- There is no land in the Morice LRMP area that is rated as having Very Low metallic mineral potential and very little rated as having Low potential.

Chart 9 Metallic Mineral Potential for BC and Morice LRMP Area



Source: BC Ministry of Energy and Mines MINFILE database

MEMPR reports an average of some $1.9 million in exploration expenditures per year (2006$)[48] for the Morice LRMP area from its Assessment Report Indexing System (ARIS) database from 1970 through 2005. ARIS reported expenditures account for approximately half of all exploration expenditures in BC[49], implying that mineral exploration may be more than $3.8 million per year in the Morice LRMP area and generate approximately 30 PYs in direct employment in BC.[50] While the exploration expenditures have modest socio-economic impacts, the benefits associated with mineral exploration accrue mainly when exploration successfully identifies a mineable deposit.

Industrial mineral potential in the Morice LRMP area is much less significant in the provincial and regional contexts than metallic mineral potential. (Industrial minerals include a wide range of minerals such as magnesite, gypsum, silica, limestone and dimension stone such as granite,

[48] Average annual ARIS expenditures from MEM reported in $1992 ($1,452,736 between 1970 and 2005) and inflated to $2006 using Statistics Canada Consumer Price Index – All Items, Canada. 2006 expenditures jumped to $4.6 million.

[49] Based on a review of ARIS expenditures as reported by MEMPR, and the BC MEMPR Provincial Mineral Exploration Expenditures as estimated by MEMPR and reported on their website.

[50] Based on an estimated 1.14 million dollars ($2006) in mineral exploration expenditures in B.C. generating 9.6 person-years (PYs) of direct employment and another 5 PYs of indirect employment as a result of purchases of goods and services required for exploration. Source: Based on a survey undertaken by Maki and Sunderman for BC Stats; as mentioned in: Holman, Gary et al., *Socio-Economic & Environmental Assessment of the "Mackenzie Draft Recommended Land and Resource Management Plan"*, pages 25 and 26.

marble, etc.).[51] The Morice LRMP area has an estimated 64,669 hectares of High/Extreme industrial mineral potential, or approximately 0.3% of all High/Extreme industrial mineral potential in BC. Land rated as having High/Extreme industrial mineral potential represents only 4% of the total Morice LRMP area compared to 22% for all of BC. The industrial mineral potential of the Morice LRMP area has not been well explored, as distance to major markets or tidewater limits the economic potential of industrial mineral deposits in the area.

The BC mining industry has experienced a considerable revival since 2003, with estimated mineral exploration expenditures reaching $130 million in 2004, $220 million in 2005 and a record $265 million in 2006[52]. Mineral tenure acquisitions province-wide reached the unprecedented levels of 4.8 million hectares in 2005 and 6.0 million hectares in 2006, with the advent of the Mineral Titles Online system (January 2005) coinciding with a period of rapid increase in mineral prices.

The Morice LRMP recognizes the historical economic contribution of the mining industry in that area of the province, as well as the high degree of mineral potential of those lands. Under the Morice LRMP, 91.7% of the total land base of the Morice LRMP would remain accessible to mineral exploration.

Table 3 Existing and Past Metallic Mineral Activity in Morice LRMP Protected Areas

Indicators of Past and Present Metallic Mineral Activity	Morice LRMP Area	Base Case Protected Areas		Total Protected Areas in Morice LRMP	
		Total	% of Morice	Total	% of Morice
Plan Area (ha)	1,501,663 ha	583 ha	0.04%	125,055 ha	8.3%
Mineral Tenures (ha)	195,399 ha	0 ha	0.00%	3,404 ha	1.7%
Metallic Mineral Occurrences (2006):					
Developed Prospect	14 occ	0 ha	0.00%	0 occ	0.0%
Past Producer	14 occ	0 ha	0.00%	0 occ	0.0%
Producer	1 occ	0 ha	0.00%	0 occ	0.0%
Prospect	25 occ	0 ha	0.00%	0 occ	0.0%
Showing	189 occ	0 ha	0.00%	7 occ	3.7%
Total	243 occ	0 ha	0.00%	7 occ	2.9%
ARIS:					
Assessment Report Sites	925 sites	0 ha	0.00%	14 sites	1.5%
Expenditures ($2006)	72,398,607	0 ha	0.00%	803,241	1.1%

Note: Exploration expenditures were supplied in $1986 constant dollars, and adjusted to $2006 using the Consumer Price Index for Canada.
Source: MEMPR Area Statistics provided by MAL, August, 2006, as per Appendix C.

[51] For more on industrial minerals, refer to: Glenn E. Bridges & Associates Inc., *Industrial Minerals – Building Block Profile,* prepared for MSRM and MEM, 2002, 19 pages.
[52] BC Ministry of Energy, Mines and Petroleum Resources, *British Columbia Mines and Mineral Exploration Overview 2006*.

As indicated in the above table, the Morice LRMP proposed protected areas have had relatively limited mineral exploration activity in the past. Together they comprise 8.3% of the total Morice LRMP area landbase, which would not be accessible to mineral exploration or mining under the plan, but account for only 1.1% of the total plan area mineral exploration expenditures and 2.9% of mineral occurrences. The Morice LRMP protected areas would include no mineral producers, past producers, developed prospects or prospects.

There are twelve mineral tenures totalling about 4,500 hectares, which will be at least partially overlapped by Protected Areas under the Morice LRMP. Mining development will consequently be precluded and as a result the tenures will be acquired by the Province and retired. These tenures are located on the periphery of a known developed prospect.

Table 4 Indicators of Metallic Mineral Potential in Morice LRMP Protected Areas

Metallic Mineral Potential in Morice LRMP & in BC	Morice LRMP Area	Base Case Protected Areas		Total Protected Areas in Morice LRMP		BC Total	
		Total	% of Morice	Total	% of Morice		Morice as a % of BC
Plan Area (ha)	1,501,663 ha	583 ha		125,055 ha	8.3%	94,156,098 ha	1.6%
Metallic Mineral Ranking (ha):							
Very High	915,467 ha	397 ha	0.04%	116,084 ha	12.7%	20,734,474 ha	4.4%
High	506,280 ha	186 ha	0.04%	5,063 ha	1.0%	15,957,447 ha	3.2%
Moderate	67,402 ha	0 ha	0.00%	2 ha	0.0%	20,015,029 ha	0.3%
Low	12,516 ha	0 ha	0.00%	3,905 ha	31.2%	21,422,257 ha	0.1%
Very Low	0 ha	0 ha		0 ha		16,026,891 ha	0.0%
Total	1,501,713 ha	583 ha	0.04%	125,055 ha	8.3%	94,156,098 ha	1.6%
Area with High and Very High Metallic Mineral Potential							
Very High & High (ha)	1,421,747 ha	583 ha	0.04%	121,147 ha	8.5%	36,691,921 ha	3.9%
% of BC Very High & High	3.9%	0.0%		0.3%		100.0%	

Source: MEMPR Area Statistics provided by MAL, August, 2006, as per Appendix C.

Of the Morice LRMP area, approximately 95% is ranked as having Very High or High metallic mineral potential[53]. The table above shows that 12.7% of the Morice area's Very High and 1% of the High metallic mineral potential lands would be in Protected Areas not accessible to mining under the Morice LRMP, an average of 8.5% when the two categories are combined. It is very difficult to put a value on this inaccessible mineral potential, other than to note that it represents 0.3% of the 37 million hectares of Very High and High metallic mineral potential lands in the province.

In addition to the potential impacts of designating new protected areas, the Morice LRMP includes management direction to address some of the concerns expressed by the Wet'suwet'en regarding mining activity within Wet'suwet'en traditional territory. The two major initiatives to address these concerns are:

[53] MEM Level I Metallic Mineral Tract rankings

- establishment of the 340,000 hectare Morice Water Management Area to maintain salmon habitat and water quality in "reference condition" with respect to current levels of metals, temperature, sediments and peak flow, and

- establishment of a set of principles, to apply to new exploration and mine developments, which outline the way in which the Wet'suwet'en envision exploration, mining and mine closure to be undertaken on Wet'suwet'en traditional territory.

The Morice Water Management Area may have implications for mineral exploration and development activities. The as yet unspecified management direction associated with the Water Management Area objectives may require efforts over and above those required by the BC Mineral Exploration Code, the BC Mines Act, the BC Environmental Assessment Act and the BC Forest and Range Practices Act. The table below outlines the extent of metallic mineral indicators within the Water Management Area boundaries.

Table 5 Metallic Mineral Indictors in Morice LRMP Water Management Area

Metallic Mineral Values in Morice LRMP Water Management Area	Morice LRMP Water Management Area						Mining Permitted Area	
	Mining Not Permitted (proposed protected)	Mining Permitted				Total Water Mgmt Area	Total Under Morice LRMP	Water Mgmt Area Proportion
		No Timber Harvest	Specific Values Identified	General Management Direction	Total Mining Permitted			
Plan Area (ha)	116,208	128,917	41,573	53,637	224,128	340,335	1,377,191	16.3%
Mineral Tenures (ha)	3,404	23,911	2,012	13,146	39,069	42,473	191,994	20.3%
Metallic Mineral Occurrences (2006):								
Developed Prospect	0	3	0	1	4	4	14	28.6%
Past Producer	0	0	0	0	0	0	14	0.0%
Producer	0	0	0	0	0	0	1	0.0%
Prospect	0	1	0	3	4	4	25	16.0%
Showing	5	15	3	7	25	30	182	13.7%
Total	5	19	3	11	33	38	236	14.0%
ARIS:								
Assessment Report Sites	13	45	3	15	63	76	911	6.9%
Expenditures ($1986)	478,328	4,043,160	27,173	199,511	4,269,843	4,748,171	43,044,169	9.9%
Expenditures ($2006)	795,603	6,724,988	45,197	331,847	7,102,030	7,897,633	71,595,366	9.9%
Metallic Mineral Potential Ranking (ha):								
Very High	111,914	116,865	21,650	22,640	161,156	273,069	799,779	20.2%
High	389	3,680	19,923	30,997	54,600	54,989	501,404	10.9%
Moderate	0	0	0	0	0	0	67,400	0.0%
Low	3,905	8,372	0	0	8,372	12,277	8,611	97.2%
Very Low	0	0	0	0	0	0	0	0.0%
Total	116,208	128,917	41,573	53,637	224,128	340,336	1,377,193	16.3%

Note: Exploration expenditures were supplied in $1986 constant dollars, and adjusted to $2006 using the Consumer Price Index for Canada.
Source: MEMPR Area Statistics provided by MAL, August 2006.

A high proportion of the Protected Areas under the Morice LRMP would fall within the Water

Management Area, such that mining would not be permitted in one third of the Water Management Area. Additionally, a further one half of the Water Management Area would be in area-specific management zones which either exclude industrial timber harvesting or identify specific values (including fish habitat) which require special management consideration. The remaining one sixth (53,637 ha) of the Water Management Area would be managed under General Management Direction according to Morice LRMP zonation, and may be most likely to require additional effort during mineral exploration and/or development to achieve the objectives of the Water Management Area (although General Management Direction in the Morice LRMP establishes objectives with respect to fish, fish habitat, aquatic ecosystems and water that are very similar to the objectives of the Water Management Area).

We are unable to estimate the magnitude of any such additional effort or cost associated with potential mining activities in the Water Management Area, but observe that any significant cost increases may decrease the feasibility of mineral exploration and development in this area. The Water Management Area would cover 16.3% of the total area accessible to mining in the Morice plan area under the Morice LRMP, including 20.3% of the mineral tenured area, 28.6% of the developed prospects (4 of 14) and 20.2% of lands identified as having Very High metallic mineral potential.

The Wet'suwet'en traditional territory mining principles, contribute to relationship building with the mining and exploration sector that is intended to lead to greater land use certainty for mineral exploration and development initiatives in Wet'suwet'en traditional territory.

Summary of LRMP Implications for the Mining Sector

The Morice LRMP should have no impacts on Huckleberry Mine, the only mineral producing mine currently in operation in the region.

The mining industry will likely benefit from increased land use certainty resulting from the LRMP.

The Protected Areas (protected from mining and industrial forestry) are, in general, located in remote areas that have had little mineral exploration activity in the past. They make 8.3% of the plan area and 8.5% of the Very High and High metallic mineral potential inaccessible to mining. It is difficult to assess the value of the metallic mineral potential in those lands, but they represent 0.3% of the 37 million hectares of Very High and High metallic mineral potential lands in BC.

Morice LRMP protected areas overlap mineral tenures totalling some 4,500 hectares that will not be accessible for mineral development.

The Morice LRMP Water Management Area may have some cost implications for mineral exploration and development activities.

2.3 Agriculture

Cattle ranching is the most common form of agriculture in the Morice LRMP area, and access to Crown lands for grazing is crucial to the viability of these operations. There are an estimated 16,076 Animal Unit Months (AUMs) of Crown land grazing in the Morice LRMP area, or approximately 1.8% of all AUMs in BC. The number of AUMs has grown 48% since 1993 (from

10,867 AUMs).[54] The economic impacts of the Morice LRMP on the beef cattle industry are estimated as follows[55]:

- $4 million in production revenues;
- Gross Domestic Product of $0.9 million
- 20 PYs in direct employment (this excludes indirect and induced employment, and excludes employment in meat processing plant);
- Range fees of almost $36,000; and
- Net economic value of $0.06 million.

Under base case management, the agriculture sector has identified the following issues to be addressed by the Morice LRMP:

- Loss of grasslands due to forest encroachment,
- Availability of Crown land for agricultural expansion, and
- Availability of Crown range for livestock grazing.[56]

2.3.1 LRMP Implications for Agriculture

The following table summarizes the distribution of agriculture land values in the Morice LRMP area across the various resource management zones designated in the LRMP.

Table 6 Morice LRMP Selected Area Statistics for Agriculture

Morice LRMP Area Agriculture Indicators	Morice LRMP Area Management Zones					
	Total Area (ha)	Private Lands	Proposed Protected Area	No-Timber-Harvest Area	Other Area Specific Management Zones	General Management Direction
Plan Area	1,501,663	2.2%	8.3%	18.1%	9.4%	61.9%
Agriculture Land Reserve	39,367	40.9%	0.4%	0.0%	12.8%	45.9%
Agriculture Leases	4,564	12.3%	0.0%	0.0%	7.4%	80.4%
High Arability Lands	52,440	0.5%	0.5%	1.0%	14.7%	83.4%

Source: BC MAL GIS data, January 2007.

The Morice LRMP includes provision for agriculture expansion lands in five different parts of the plan area totalling 41,000 hectares.[57] From these designated areas, a maximum of 20,500 hectares of Crown lands would be gradually leased for agricultural purposes at prescribed maximum rates of uptake, and eventually converted to fee simple ownership under the Agricultural Land Reserve.

[54] Source: B.C. Ministry of Forests, Morice TSA Socio-Economic Analysis: Executive Summary, January, 1996, http://www.for.gov.bc.ca/hts/tsr1/tsasea/sea/tsa20/httoc.htm

[55] For more detail, see: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, June 2004, Appendix 4.

[56] Source: B.C. Ministry of Agriculture and Lands, Integrated Land Management Bureau, February 2007, page 63.

[57] GIS data supplied by BC MAL - ILMB, January 2007.

Table 7 Target Area of Land Available for Expansion of Agriculture Activities

	Maximum Area (ha)	Expansion Rate (ha per 5 year period)
Fulton Lake	2,500	250
Bulkley	10,000	600
Parrott	6,000	400
Poplar Lake	1,500	200
Ootsa Lake	500	200
	20,500	

Source: BC Ministry of Agriculture and Lands, Integrated Land Management Bureau, February 2007, page 63.

The Morice LRMP would benefit the cattle ranching sector by targeting 20,500 hectares of additional Crown land to be allocated to agriculture activities, provided that agriculture is the highest and best use of the land. The Morice Landscape Model sensitivity analysis of agriculture expansion impacts on timber supply[58] indicates that the maximum targeted expansion of agriculture lands, if it occurs, could have a significant impact on timber supply (up to 1% reduction in long term timber supply). There is some doubt whether the maximum is likely to be achieved given Implementation Direction in the Morice LRMP document regarding a "most appropriate commercial use of the land" test (See Morice LRMP, 2007, pp. 64).

Summary of LRMP Implications for the Agricultural Sector

There are no agricultural leases, and almost no Agriculture Land Reserve lands or High Arability lands in the Protected Areas.

The Morice LRMP will benefit the cattle ranching sector by targeting 20,500 hectares of additional Crown land to be allocated to agriculture activities, provided that agriculture is the highest and best use of the land.

There may be operational cost increases for agriculture operations on Crown grazing lands and future agriculture expansion lands in respect of best management practices for protection of cultural features and sites.

2.4 Energy

2.4.1 Oil and Gas

The following table summarizes the distribution of estimated potential oil and gas resources in the Morice LRMP area. Little oil and gas exploration work has occurred, but portions of the Bowser Basin thought to have high oil and gas potential extend into the northeast part of the plan area, and portions of the Nechako Basin thought to have moderate oil and gas potential extend into the eastern side of the plan area. The existing east/west gas pipeline that runs through the central portion of the Morice LRMP area enhances the economic viability of any discovered gas reserves

[58] Gowlland Technologies (Andrew Fall), *Final Plan Analysis*, Morice LRMP: Government Technical Team, May 5, 2004.

in the area.

Table 8 Potential Oil and Gas Resources by Morice LRMP Management Zone Type

Morice LRMP Area	Hectares	Protected Area	Area Specific	GMD	Total
Gas Only Potential (ha)					
High	0	0%	0%	0%	0%
Moderate	0	0%	0%	0%	0%
Low	13,699	0%	17%	83%	100%
Poor	0	0%	0%	0%	0%
Oil & Gas Potential (ha)					
High	42,791	0%	20%	80%	100%
Moderate	106,624	1%	43%	55%	100%
Low	0	0%	0%	0%	0%
Poor	471,758	10%	47%	44%	100%

Source: BC MSRM GIS data, March 2004; Alterations to management zones resulting from G2G discussions subsequent to 2004 do not significantly alter the distribution of values noted in this table.

There is currently no oil and gas drilling activity in the Morice LRMP area.

The above GIS data indicates the following:

- Approximately 41% of the Morice LRMP landbase (621,000 hectares) is rated as having some oil and gas potential, but only 42,791 ha (2.9%) of the area is rated as having high potential for oil and gas. The balance is rated as having moderate or poor potential.

- None of the high oil and gas potential areas are in Protected Areas.

The LRMP is not expected to materially encumber the modest oil and gas potential in the plan area.

2.4.2 Hydroelectric Power

The Morice LRMP area includes a significant portion of the Nechako reservoir system created as part of the Kemano hydroelectric power project. This includes Tahtsa Lake, Ootsa Lake and Whitesail Lake in the southern part of the Morice LRMP area. The LRMP is not expected to impact the operation of the Nechako reservoir.

Potential future hydroelectric power projects, including micro hydro projects, may be constrained by provisions in the Morice LRMP regarding aquatic ecosystems and water resources. Area specific management for Nanika River specifically prohibits hydroelectric developments on the river. The significance of hydroelectric potential in the Morice LRMP area has not been assessed.

Summary of LRMP Implications for the Energy Sector

The Morice LRMP is not expected to materially encumber the modest oil and gas potential in the plan area.

The Morice LRMP should not have an impact on the operations of the Nechako reservoir.

The Morice LRMP may have some impacts on the potential for small scale hydroelectric development in the plan area.

2.5 Trapping

There are an estimated 62 trapping territories that are either entirely or partially within the Morice LRMP area.

Trapping in the Morice LRMP area generates annual revenues estimated at $87,000. This is based on the average reported harvest for the Morice LRMP area between 1989 and 1998 and 2003 prices for pelts. Appendix 7 of the 2004 SEEA (Pierce Lefebvre Consulting, 2004) provides more detail on these estimates.

Summary of LRMP Implications for the Trapping Sector

The Morice LRMP will benefit the trapping sector mainly as a result of benefits accruing to the wildlife sector[59]. There may also be some benefits derived from preferential access (public access restrictions) to trapping territories in some areas.

The Morice LRMP maintains physical access to trapping tenure by all "existing and future access routes, and methods of transportation … across all land use designations for the purposes of tenure holders access to trap line areas and guide territories"[60]. As a consequence, trapping tenure holders should not be negatively impacted either by the access plans proposed by the LRMP, or Protected Area designations.

2.6 Botanical Forest Products

Botanical forest products are often described as non-timber based products, generally including any product from the forest other than trees used for the production of lumber and other solid wood products or pulp.[61] The Ministry of Forests and Range estimated that in 1998, the botanical forest products sector in BC generated sales revenues of approximately $50 million from the harvest of wild edible mushrooms and $60 million from the sale of floral greens and salal sales,

[59] See: Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June 2004.
[60] Source: BC Ministry of Agriculture and Lands, February 2007, page 59.
[61] B.C. Ministry of Forests (Sinclair Tedder) and Mitchell Consulting Associates, *Seeing the Forest Beneath the Trees: The Social and Economic Potential of Non-Timber Forest Products and Services in the Queen Charlotte Islands/ Haida Gwaii*, prepared for South Moresby Forest Replacement Account, 2000, 144 pages.

mainly from Vancouver Island. Other botanical forest products include herbal medicines and wildcrafted medicinal herbs.

The botanical forest products sector in BC is not regulated, and provides no direct public sector rent in the form of royalties or other Crown revenues. The harvesting of botanical forest products in BC including the harvesting of wild edible mushrooms in the Queen Charlotte Islands/ Haida Gwaii (QCI/HG), generates significant socio-economic benefits to those involved, but not necessarily to the local communities.

The Morice LRMP recognizes the importance of botanical forest products to First Nations, noting that there are over 130 plant species historically utilized by the Wet'suwet'en people. The Morice LRMP also recognizes the importance of botanical forest products to all local residents for personal use and consumption.[62] The Office of the Wet'suwet'en is developing a berries management plan, which aims to re-establish and enhance huckleberry production to provide for traditional cultural use as well as commercial sale.

The Morice LRMP provides general management direction (GMD) aimed at maintaining or enhancing the distribution and abundance of botanical species over time, maintaining access to important botanical species, limiting impacts to important botanical species and ecosystems to natural disturbance regimes, maintaining or developing organic certification, specifically maintaining pine mushroom habitat, and limiting the use of pesticides.

Based on a brief overview of the existing BC industry, one can infer that while botanical forest products have important cultural and personal values, the economic benefits of botanical forest products are likely to continue to be minimal to both the local communities and to the Crown.

Socio-economic impacts associated with botanical forest products GMD cannot be assessed in more detail:

- There are no estimates of the size of the area that would be most suitable for botanical forest products and to which the proposed GMD may apply. The Morice LRMP Economic Development Plan recognizes the need to conduct inventories of suitable sites for botanical forest products. Site suitability should pertain to site productivity as well as access.

- Until the suitable sites and areas are identified, any trade-offs between botanical forest products and other values cannot be estimated.

Summary of LRMP Implications for Botanical Forest Products

The Morice LRMP makes several provisions to maintain or enhance the production of botanical forest products. The Morice LRMP recognizes the importance of botanical forest products to all local residents for personal use and consumption, and their cultural significance to First Nations.

While the Morice LRMP may benefit the development of botanical forest products, and with them significant heritage, cultural and personal values, the economic impacts are likely to be minimal to the local communities and to the province.

[62] Source: BC Ministry of Agriculture and Lands, Integrated Land Management Bureau, *Morice Land and Resource Management Plan*, February 2007, page 68.

3 Backcountry Tourism Implications

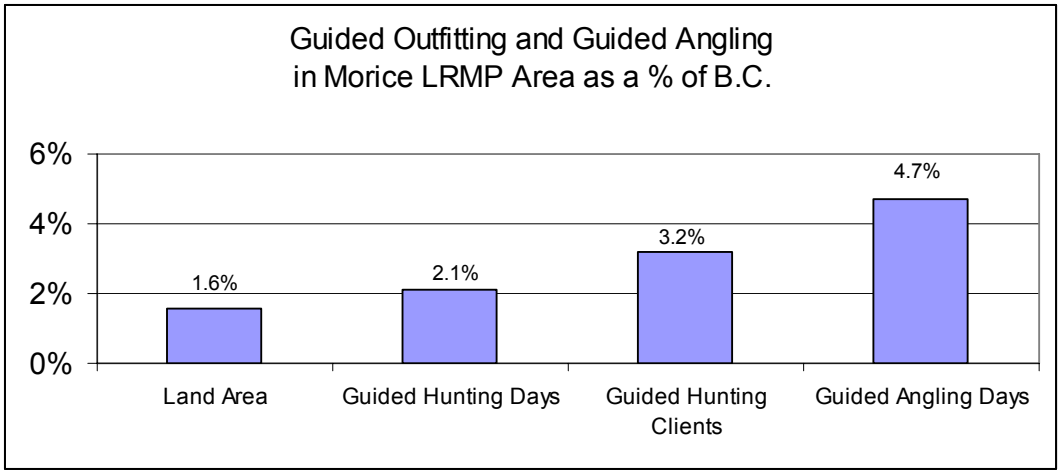
3.1 Overview of Backcountry Tourism

There are three main aspects to mid-country and backcountry tourism in the Morice LRMP area. They include:

- Guide-outfitting (9 guide outfitters with 3 of these having a base or satellite camp in the Morice LRMP area);
- Guided-angling (19 to 26 guides: 19 guides operate on the major rivers and lakes in the Morice LRMP area and another 7 operate over the length of the Bulkley River, some within the Morice LRMP area); and
- Adventure/ Wilderness tourism (5 to 10 operations).[63]

The Morice LRMP area accounts for approximately 2.1% of guided hunting days in BC and 4.7% of guided angling days in BC (compared to the Morice LRMP area accounting for 1.6% of the total land area of BC.).

Chart 10 Guide Outfitting and Guided Angling Effort in the Morice LRMP Area



Note:
The Morice LRMP Area as a % of BC's Total Area is based on the Plan Area covering 1.5 million hectares and a total BC area of 94.7 million hectares.
Source: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations,* Appendix 5.

3.2 Base Case Management Regime

The following lists current management direction in the Morice area that is of particular relevance to the tourism and recreation sectors:

- The Telkwa Caribou Recovery Area covers some 155,247 hectares[64] and establishes

[63] For more detail, see: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, June 2004, Appendix 5.

measures that minimize disturbances to caribou. This includes designating areas that are non-motorized or have restrictions on motorized recreational use for approximately half of that area. Under the Telkwa Caribou Recovery Area, motorized recreational activities are restricted on 3% of the landbase in the winter (44,547 hectares including 33,837 ha of non-motorized during all seasons and 10,711 hectares of restricted access, also during all seasons). In addition, in the summer, a further 7,913 ha of non-motorized access brings the total landbase under motorized restrictions in the summer to 3.5% of the Morice LRMP area.

- Under the Base Case regime, approximately 730,000 hectares (48% of the total land area) are designated as Scenic Areas, of which 521,000 hectares (35% of the landbase) are classified as highly sensitive, 44,000 hectares (3% of the landbase) as moderately sensitive and 165,000 hectares (11% of the landbase) as having low sensitivity.

- Under the Base Case regime approximately 272,000 hectares (18% of the landbase) are managed under specific Visual Quality Objectives (VQOs).

- The Morice LRUP Zone A established prior to the Morice LRMP, protects the Morice River corridor from timber harvesting, except to address threatened forest health.

- The Granisle (4,034 ha) and Houston (3,511 ha) Community Recreation Areas were established in the 1990s, to be managed primarily for recreation values. They provide trails for horseback riding, mountain biking, walking, hiking, cross-country skiing and snowmobiling. Management for the Houston Community Recreation Area includes motorized access restrictions.

- There are currently three small protected areas for recreation: Red Bluff Park (148 ha) and Topley Landing Park (12 ha) on Babine Lake, and Little Andrews Bay Park (45 ha) on Ootsa Lake.

- The Forest and Range Practices Act (previously the Forest Practices Code) requires consideration of ecological and other values associated with the landbase, including recreation values, in considering approval of Forest Development Plans.

3.3 LRMP Implications for Backcountry Tourism

The Morice LRMP protected areas, No-Timber-Harvest Areas and other area specific management zones cover 35.5% of the plan area. These areas contain high proportions of many of the plan area's tourism and recreation values, as noted in the table below.

[64] Includes the areas 9A, 9B, 9C and 9D of the Telkwa Caribou Range from the Area Statistics provided by MSRM for this project (April 2004); this area corresponds to the Telkwa Caribou Recovery Area map in: Horn, Hannah and Gregory C. Tamblyn, *Morice Planning Area Background Report*, page 37.

Table 9 Tourism and Recreation Values in Morice LRMP Management Zones

Morice LRMP Area Tourism and Recreation Values	Morice LRMP Area Specific Resource Management Zones					
	Total Plan Area	Proposed Protected Area	No-Timber-Harvest Area	Other Area Specific Management Zones	Total Protected, No-Timber-Harvest and Other Area Specific Zones	
					Hectares, Sites or Km	% of Total Plan Area
Proportion of Plan Area (ha)	1,501,663	125,055	271,610	137,163	533,828	35.5%
Existing Tourism Facilities (sites)	52	3	8	6	17	32.7%
Existing Tourism Features (sites)	230	29	19	47	95	41.3%
Kilometres of Trail (km)	1,048	60	103	320	483	46.0%
Tourism Opportunity (ha)						
High	55,876	17,437	18,530	13,769	49,736	89.0%
Medium	106,070	20,112	46,146	4,382	70,640	66.6%
Recreation Opportunity Spectrum (ha)						
Primitive	189,077	61,313	125,404	1,714	188,431	99.7%
Semi Primitive Motorized	159,712	12,488	38,974	21,186	72,648	45.5%
Semi Primitive Non-Motorized	291,096	26,938	75,342	27,997	130,277	44.8%
Scenic Areas - LRMP_VAL[65] (ha)						
Class 1	662,563	110,962	137,440	76,083	324,485	49.0%
Class 2	247,225	2,724	67,344	14,493	84,561	34.2%
Class 3	33,410	0	0	3,986	3,986	11.9%

Source: BC MAL GIS data, August 2006, as per Appendix C.

3.3.1 LRMP Implications for Guide-Outfitting

The *Morice Planning Area Background Report* identifies nine guide-outfitters with territories that overlap the Morice LRMP boundaries[66], with three of these having a base or satellite camp in the Morice LRMP area[67].

Guide-outfitting in the Morice LRMP area generates an estimated 21 Full Time Equivalents (PYs) of direct employment. Other impacts are as follows:

- Industry revenues of $1.81 million;
- GDP of $0.64 million from direct activities; and
- Net economic value of $0.16 million[68].

[65] Scenic Areas - LRMP_VAL refers to designated scenic areas and scenic area classes defined at the beginning of the Morice LRMP planning process, which were significantly altered from those defined and referred to in the then current MOFR Timber Supply Review documents (TSR2).
[66] Source: Horn, Hannah and Gregory C. Tamblyn, *Morice Planning Area Background Report*, page 75.
[67] The *Morice LRMP Base Case Socio-Economic Assessment* states that there are thirteen guide-outfitters whose territories cover part of the four Wildlife Management Units (WMUs) that overlap the plan area, but these four WMUs cover 3.9 million hectares, which is 2.5 times the size of the Morice LRMP area.
[68] These data represent an estimate of the activities that depend on the Morice LRMP landbase, not the

Increasingly, guide-outfitters in the Skeena region provide other guided experiences in addition to hunting, with hunting days now accounting for 55% of total guided days and guided fishing and other products accounting for the other 45%. Hunting revenues, however, continue to account for 73% of total revenues.[69]

The Morice LRMP maintains existing use by guide outfitting and trapping tenure holders, across all land use designations:

The LRMP objectives relating to guide-outfitting are to:

1. Maintain sustainable populations of game species;
2. Maintain guide outfitting opportunities across the plan area; and
3. Maintain the level and type of physical access to guide territories.

The plan objective to maintain physical access to guide territories defines this access as follows: "retain over time, all existing and future access routes and methods of transportation (pickups, snowmobiles, horses, boats, aircraft, ATVs, dog sled) across all land use designations for the purpose of tenure holder's access to trap line areas and guide territories." [70]

The Morice LRMP is expected to have a positive impact on existing guide-outfitting operations as now discussed for each of the land-use designations:

Protected Areas and No Timber Harvest Areas

The Protected Areas and No Timber Harvest areas that represent 26.4% of the plan area are expected to have a very positive impact on the existing guide-outfitting operations. They will do this by maintaining wildlife habitat, maintaining the wilderness hunting experience and providing guide-outfitters with continued, and sometimes exclusive, motorized access.

The value of some guide-outfitting base camps and cabins (or their sites) in the proposed PAs may be enhanced through future exclusivity of use and access. Guide-outfitters have expressed concern that in spite of access exemptions, park management provisions may constrain their operations.[71]

Other Area Specific Management Zones and General Management Direction

Guide-outfitters are also expected to benefit through other area specific and general management direction aimed at protecting hunting, trapping and tourism opportunities, as well as maintaining or enhancing wildlife habitat[72]. Motorized access restrictions in several parts of the plan area should benefit guide-outfitters in their ability to provide a consistent hunting experience (particularly given the exemption from these restrictions for their activities).

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broader area covered by the four WMUs that overlap the Morice LRMP area (see previous footnote).

[69] Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations,* June 2004, Appendix 5 provides more data on guide outfitting in the Skeena region.

[70] Source: BC Ministry of Agriculture and Lands, *Morice LRMP,* February 2007, page 77.

[71] Nanika Guiding (Jim Tourond), letter to the Morice LRMP Table, January 2nd, 2004.

[72] See: Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June, 2004.

Summary of LRMP Implications for Guide-Outfitting

The Morice LRMP is expected to have a positive impact on existing guide-outfitting operations.

The guide-outfitting sector will benefit from GMD aimed at maintaining tourism and recreation values such as scenic areas, and the functionality of facilities, features and trails. The guide-outfitting sector will also benefit from GMD aimed at maintaining wildlife habitat. Moreover, guide-outfitters will benefit from the preservation of wildlife and tourism values in the Protected Areas, the No Timber Harvest areas and other Area Specific Management Zones.

The Morice LRMP maintains motorized access for guiding activities in all areas.

The growth potential for guide-outfitting operations is limited by preferred wildlife species populations, and will likely result more from increasing the quality of the hunting experience than from increasing the volume of hunter clients. There may be volume driven growth potential in the non-hunting products offered.

If guide-outfitting operations grow through the non-hunting product portion of their business, then access provisions that do not conform to the area specific restrictions on recreation activities may become an issue.

3.3.2 LRMP Implications for Guided Angling

In 1998/1999, there were 19 guides operating on the major rivers and lakes in the Morice Area, and an additional 7 angling guides that operated over the length of the Bulkley River. A total of 2,978 guided days are granted to these operators (excluding the Bulkley River). Guided angling in the Morice LRMP area provides the following socio-economic benefits:

- 13 PYs of direct employment;
- Industry revenues of $2.3 million;
- GDP of $0.9 million; and
- Net economic value of $0.2 million.[73]

The Morice LRMP has established Area Specific Management zones and Protected Areas along all the rivers and lakes in the Morice LRMP area that are Classified Waters[74], and where guided angling takes place, except for Babine Lake. For all Classified Waters other than Babine Lake, there will be constraints on timber harvesting along the shores of the classified lakes and rivers as well as various measures to protect fish habitat.

[73] For more detail, see: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations,* June 2004, Appendix 5.

[74] The B.C. Government developed the Classified Waters Licensing System to preserve the unique fishing opportunities provided by streams and lakes, which contribute significantly to the province's reputation as a world class fishing destination. The classified waters of B.C. include forty-two (42) highly productive trout streams which are classified as either **Class I** or **Class II** depending on level of use as well as some lakes. Additional licenses are required for fishing in classified waters. Source: Ministry of Water, Land and Air Protection web site, accessed April 19, 2004.

For Babine Lake, the Morice LRMP has established marine parks (Protected Areas) that cover 5,750 hectares of land and water, and a relatively small Area Specific Management zone around the shore of the east arm of Babine Lake. The Morice LRMP has also developed general management direction that is aimed at enhancing and protecting fish habitat, aquatic ecosystems and riparian areas. Moreover, the Morice LRMP establishes a framework and direction for the development of a Lakeshore Management Strategy. This includes identifying key values and management goals associated with individual lakes (e.g. ecological, wilderness, quality and general/family recreation oriented lakes), and establishing a framework for the development of a Lakeshore Management Strategy.

The following table lists the Classified Waters in the Morice LRMP area along with the type of management zones established in the Morice LRMP that include these waters.

Table 10 Morice LRMP Management Zones for Guided Angling Rivers and Lakes

Classified Waters in the Morice LRMP Area	Number of Guides Granted Rod Days	Number of Days Granted	Morice LRMP Designations Protected Area (PA), Area Specific Management (ASM), No Timber Harvest ASM (NTASM)		Hectares
Morice River	3	433	Morice River	ASM	24,138
Nanika River	3	260	Nanika River	ASM	1,316
Nadina River	1	50	Nadina River	ASM	6,232
Babine Lake	14	1,595	Babine East Arm	ASM	2,714
Morice Lake	7	480	Morice Lake	PA	47,677
Nanika Lake	4	95	Morice Range/ Nanika Lake	NTASM	Not Readily Available
Kidprice Lake	3	65	Kidprice Lake Chain	PA	16,003
Bulkley River	Not available	Not available	Bulkley River	ASM	7,578
Total		2,978			N/A

Source: Prepared by *Pierce Lefebvre Consulting* based on ILMB data. For more detail on guided angling, see: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations,* June 2004, Appendix 5.

The management direction in the various zones containing Classified Waters is not entirely incremental to Base Case. In particular, the Morice LRUP Zone A established prior to the Morice LRMP already protected the Morice River corridor from timber harvesting except to address threats to forest health.[75] Also, the large Nadina LRUP established prior to the LRMP included what is now the Nadina River ASM zone, although in 1996, the Chief Forester determined that the Nadina LRUP did not require consideration as a special management unit as it was adequately represented through the various netdowns and in the other management zones.[76]

[75] Horn, Hannah and Gregory Tablyn, *Morice Planning Area Background Report*, page 54.
[76] B.C. Ministry of Forests, *Morice Timber Supply Area Rationale for AAC Determination*, 1996.

Summary of LRMP Implications for Guided Angling

The guided angling sector will benefit from the Morice LRMP GMD mainly through the various maintenance and enhancement measures for fish habitat[77] and recreational features, as well as through more comprehensive scenic area designation and management. Area Specific Management zones and Protected Areas should help maintain or enhance the fishing experience on Classified Waters.

Future expansion of angling guide operations is constrained by rod day quotas issued by the Ministry of the Environment's Fish and Wildlife Program.

3.3.3 LRMP Implications for Other Adventure Tourism

In addition to the guide-outfitters and guided angling businesses that operate in the Morice LRMP area, there are another 5 or 6 commercial tourism operations that offer backcountry multi-day tours in the Morice LRMP area. These may include backcountry skiing, snowmobiling tours, canoeing/kayaking tours, hiking and trail riding tours. The 5 or 6 commercial tourism operators in the Morice LRMP area provide the following socio-economic benefits:

- 9 PYs of direct employment;
- Industry revenues of $0.63 million;
- GDP of $0.38 million; and
- Net economic value of $0.05 million.

The adventure tourism sector in the Morice LRMP area (excluding guide-outfitting and guided angling) currently accounts for relatively modest socio-economic impacts.[78]

The Morice LRMP will have a positive impact on the wilderness/ backcountry tourism sector:

- The PAs, No Timber Harvest areas, and other Area Specific Management areas include 89% of the High Tourism Opportunity areas and 41% of the tourism features. The Morice LRMP expresses objectives and management direction for all PAs that encourages economic opportunities for small, locally based commercial recreation.

- The PAs, No Timber Harvest areas and other Area Specific Management zones include 33% of existing tourism facilities. Most existing tourism facilities are scattered along lakes and rivers throughout the Morice LRMP area, including popular areas such as Babine Lake, the Morice River, the Nadina River and along the Bulkley River.

- All tourism facilities will likely benefit from the GMD guidelines for scenic areas.

Other indicators of benefits to the adventure tourism and backcountry sector from the Morice LRMP include:

[77] See: Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June, 2004.
[78] For more detail, see: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations,* June 2004, Appendix 5.

- 99.7% of the Recreation Opportunity Spectrum (ROS) Primitive areas will be subject to area specific management, mostly in PAs or No Timber Harvest areas; and

- 45% of the ROS semi-primitive non-motorized areas will be subject to area specific management.

The Morice LRMP has designated some areas as non-motorized during all seasons while others are non-motorized in the summer or in winter. This is reviewed in more detail in the impacts of the Morice LRMP on the recreation sector.

The Morice LRMP GMD has established objectives for considering the interests of wilderness lodges and tourism businesses in forestry, mining or other resource development plans:
- No loss of integrity and functionality of features within a 200 metre management zone surrounding the feature,
- No loss of integrity and functionality of facilities within a 1000 metre management zone for lodges and 500 metre management zone for cabins associated with tourism operations,
- No loss of integrity and functionality of trails within a 200 metre management zone on each side of the trail, and
- Consultation requirements for any development activities that approach these management zones.

By contrast, the Forest Practices Code did not "…require specific consideration of the interest of business owners adjacent to forested Crown Lands"[79] in the development and approval of Forest Development Plans.

Summary of LRMP Implications for Other Adventure Tourism

Area specific management zones under the Morice LRMP should help to preserve many of the natural attributes of the plan area that support adventure tourism activities.

The adventure tourism sector will benefit from the Morice LRMP GMD mainly through the management consideration of facilities, trails, and features as well as through management for visual resources.

Consultation provisions included in the Consultation GMD and in the Guidelines for Features, Facilities and Trails Management should be particularly beneficial to the tourism sector.

3.3.4 LRMP Implications for Tourism Potential

- In 2002, the Office of the Wet'suwet'en, Meredith Associates and other consultants conducted a major study of tourism opportunities for the Morice Forest District.[80] The study identifies the following products as the best short term options for outdoor recreation based tourism products:

[79] Forest Practices Board, *Timber Harvesting and Fishing Lodge Interests near Morrison Arm,* Complaint Investigation 000284, January 2002, page 9.
[80] Office of the Wet'suwet'en, Meredith & Associates et al, *Morice Forest District Tourism Opportunity Study*, 2002.

- Historical/cultural winter adventure;
- Freshwater-non-motorized activities including canoeing, rafting, drifting and river activities; this includes activities along the Bulkley and Morice Rivers;
- Summer trails (non-motorized), with access to significant features and viewscapes, and links to lodges and huts;
- Road tours;
- Air tours;
- Destination lodge;
- Hut system for winter and summer recreation; and
- Lake tours with link to fishing, cultural activities, lodges and hut system.

All of the above tourism products have the potential to include a cultural and heritage component. The Tourism Opportunity Study lists three specific Wet'suwet'en tourism initiatives including the development of a destination marketing organization/tourism bureau, the development of historical trails, and the development of a rafting product that would start at Morice Lake and continue for 12 days through the Wet'suwet'en and Gitxsan Territories.

This Tourism Opportunity Study (TOS) provides maps of high suitability areas for the various potential recreation and tourism opportunities. While not definitive, these maps assist in providing a spatial representation of opportunities that can then be matched to the Morice LRMP as follows:

- Hut system suitability under the TOS is highest for the following areas:
  - West Telkwa range, part of which will be in the Burnie-Shea Lakes PA under the LRMP;
  - the East Telkwa range, which remains under GMD in the LRMP;
  - the North Morice Range and the Red Slide Mountain, which will both be in a combination of No Timber Harvesting areas and Protected Areas under the LRMP.

- Summer non-motorized trail suitability in the TOS mirrors the hut capability map except that there are a few additional areas that are also identified as being highly suitable. They include:
  - Morice Mountain, which will be in an Area Specific Management Zone under the LRMP;
  - Nadina Mountain, which will become a small Protected Area, surrounded by a larger Nadina-Owen Area Specific Management Zone under the LRMP;
  - the Sibola Range, which will be mostly in a No Timber Harvest area under the LRMP; and
  - the Herd Dome, which will be a No Timber Harvesting area under the LRMP.

- The TOS highlights areas that have high suitability for new destination lodges. These include:
  - Area along Babine Lake: the Morice LRMP has established various marine parks along Babine Lake totalling 5,750 hectares; also, the GMD for the Morice LRMP and the Lakeshore Management Strategy will help protect the functionality of existing recreation and tourism facilities and features;
  - Area along the Morice River south of Houston towards Morice Lake: this will now be part of the Morice River Area Specific Management zone under the LRMP;
  - A corridor called the Atna Bay to Tahtsa Lake Route running from Atna Bay around the west side of South Morice Range, the west end of Morice Lake, the west side of Redslide Mountain and the southwestern end of Nanika Lake: Under the Morice LRMP this corridor will run through a combination of Protected Area and No Timber Harvesting Area, and it will be important from a tourism standpoint that the protected area portions allow the selected development of commercial tenures; and
  - Area in the East Telkwa Ranges, which will remain under GMD under the LRMP.

- The TOS highlights areas that have high suitability for snowmobile activities. They include:
  - The Topley to Granisle McKendrick Pass Snowmobile route, which will remain primarily under GMD under the LRMP; and
  - The Dungate Meadows area, which also remains under GMD under the LRMP.

  The study identifies many other areas that are of moderate suitability for snowmobile activities including the West Telkwa Ranges, the East Telkwa Ranges, Sibola Range and many others. Much of this area will be in No Timber Harvesting areas under the LRMP.

The Morice LRMP provides an access management plan for motorized and non-motorized recreational activities which covers many of the areas listed above. This is discussed in more detail in the recreation impacts section.

Summary of LRMP Implications for Tourism Potential

The Morice LRMP zoning provides for various Protected Areas, No Timber Harvesting areas and Area Specific Management zones, as well as an extended inventory of Scenic Areas, that will support the development of tourism activities in the future.

How much and how quickly this potential will be realized will depend on markets, entrepreneurship and how accommodating management plans for Protected Areas are for tourism development.

4 Recreation Activities Implications

4.1 Overview of Recreation Activities

The Morice LRMP area supplies an estimated 100,000 recreation days per annum to people engaging in backcountry recreation activities. This excludes visits to local lakes for boating, swimming and other front country activities. This estimate is very approximate and is based on the data sources documented in the 2004 SEEA of the Table Recommended Plan[81], which describes the recreation sector in the Morice LRMP area in more detail.

There are two basic approaches to assessing the economic significance of recreation activities including:

- Level of expenditures by participants; and
- Net economic value, represented by the participants' willingness to pay over and above the level of expenditures.

The following table summarizes the key recreation activities occurring in the Morice LRMP area and where available, provides data on level of activity, direct expenditures and net economic value.

Valuing recreation days is difficult, but various studies have pegged the willingness to pay at

[81] Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations,* June 2004, Appendix 6.

between $10 per recreation day and $50 per recreation day, which results in a net economic value ranging between $1 million and $5 million for the estimated 100,000 backcountry recreation days occurring in the Morice LRMP area.

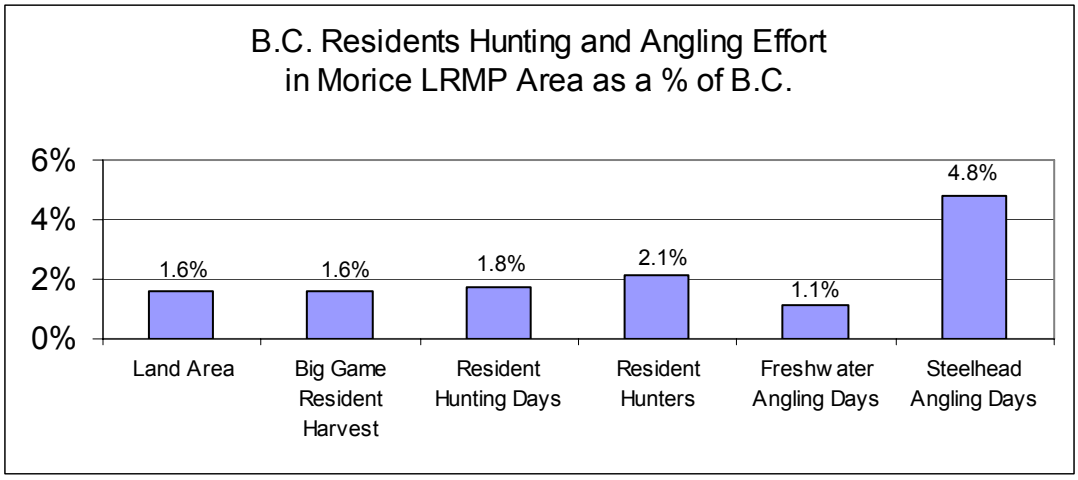
Table 11 Economic Significance of Recreation Activities in the Morice LRMP Area

Type of Activity	Estimated Recreation Days	Estimated $ Spent per Day
Resident Hunting	10,000 to 16,500 hunter days	$50
Resident Angling	52,500 angling days	$29
Snowmobile Activities	12,000 recreation/visitor days	non-locals: $85 to $225 per day
Camping	20,000 camping visits	Not available
Non-Motorized & Other	Not available	$45
Total Recreation Days	94,500 to 101,000 recreation days	
Recreation	Net Economic Value/ Willingness to Pay	
Depends on Activity and Source of Data	BC Ministry of Water, Land and Air Protection estimated values in $50/day range (1998 estimate)	100,000 days @$50 per day yields $5 million
	Environment Canada survey estimates values in $10 to $20/day range	100,000 days @$10 per day yields $1 million

Note: More detail on estimated expenditures and Net Economic Value per recreation day is presented in Appendix 6 of the 2004 SEEA report: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, June 2004, Appendix 6.

Steelhead angling in the Morice LRMP area is particularly significant in a provincial context, accounting for approximately 4.8% of the steelhead angling effort in BC. General freshwater angling, and hunting by BC residents, are also fairly significant given the remoteness of the area to large population centres.

Chart 11 Estimated Hunting and Angling Effort by BC Residents



Note:
The Morice LRMP Area as a % of BC's Total Area is based on the Plan Area covering 1.5 million hectares and a total BC area of 94.7 million hectares.
Source: Pierce Lefebvre Consulting, Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations, June 2004, Appendix 6.

There may be opportunities for the recreation sector in the Morice LRMP area to expand. The

Morice LRMP Economic Development Plan[82] identifies various activities that may have robust growth in the future including house boating, snowmobile tours/destination snowmobiling, commercial recreation site development, First Nations heritage site development and guided tours of historic mines/prospecting tours. On the other hand, recreation is often dependent on the size of the local and regional populations, which in turn may limit opportunities for growth. Moreover, limited entry hunting and rod day quotas for fishing may limit expansion opportunities.

4.2 Base Case Management Regime

The management direction in the Morice area that is of particular relevance to the backcountry tourism sector applies also to the recreation sector. This includes:

- The Telkwa Caribou Recovery area establishes measures that minimize disturbances to caribou. This includes restricting motorized recreational activities in approximately 3% of the Morice LRMP area in the winter, and 3.5% in the summer; (of particular relevance to recreation, the polygons 9B (Starr Creek) and 9D were already non-motorized under the Telkwa Caribou Area, and the polygon 9C was designated as non-motorized in the summer);[83]

- Scenic area designation on approximately 48% of the Morice LRMP area and VQOs on approximately 18% of the landbase;

- The Morice LRUP Zone A which protects the Morice River corridor from timber harvesting;

- Two Community Recreation Areas, one in Granisle and one in Houston that are managed primarily for recreation values (0.5% of the landbase);

- Three small protected areas, two on Babine Lake and one on Ootsa Lake; and

- The Forest and Range Practices Act (previously the Forest Practices Code) which requires consideration of ecological and other values including recreation values.

4.3 LRMP Implications for the Recreation Sector

The Morice LRMP will have a generally positive impact on the recreation sector.

- Recreation GMD provides specific direction to maintain facilities, features and trail functionality, and outlines consultation requirements where impacts from resource development may occur.

- The Nanika-Kidprice portage trails, which consist of three portage trails linking a series of lakes will be protected in the Kidprice Protected Area and Tahtsa Troitsa No Timber Harvest Area.

[82] Source: B.C. MSRM, Skeena Region et al., *Morice Land & Resource Management Plan Economic Development Action Plan (EDAP)*, 2003, 177 pages.
[83] Horn, Hannah and Gregory C. Tamblyn, *Morice Planning Area Background Report*, 2000, page 37.

- The integrity and functionality of the Grease Trail between Fort Babine and Talkla Lake will be maintained with a 100 metre No Timber Harvest buffer on either side of the trail, and a 70% mature forest retention direction between 100 metres and 500 metres on either side of the trail.[84] Also, the Grease Trail will be designated as non-motorized in the summer.[85]

- Resident hunting (between 10,000 hunter days and 16,500 hunter days) will benefit from measures to maintain and enhance wildlife habitat and wildlife populations[86], as well as measures in some Area Specific Management zones that will help to maintain a wilderness hunting experience.

- Resident anglers (approximately 52,500 angling days) will benefit from the protection of recreation values along the Classified Waters in the Morice LRMP area (i.e. Morice river, Bulkley river, Nadina river, etc.); resident anglers will also benefit from the marine parks along Babine Lake and from the GMD that aims to protect recreational features.

- Campers in the Morice LRMP area (estimated at 20,000 camping days) will benefit from the Morice LRMP. Camping is offered at 22 of the 25 Ministry of Forests and Range (MOFR) recreation sites in the Morice LRMP area. The MOFR recreation sites will benefit from GMD for recreation that aims to maintain or improve the integrity and functionality of features, facilities and trails. Also, of the 25 MOFR recreation sites, 11 will be located in protected areas or in Area Specific Management zones (including those on the shores of Babine Lake, the Morice River, Morice Lake, the Nadina River, Owen Lake and the Twinkle-Horseshoe chain).[87]

- Snowmobiling (estimated at 12,000 visitor days per year) will not be significantly impacted by non-motorized restrictions as some of the highly popular areas such as the Telkwa range, the Dungate area, the Sibola range and the Topley-Granisle Trail network, will remain mainly open to motorized activity in the winter. Some areas have been earmarked as non-motorized, and snowmobiling users will be restricted in those areas. This includes some of the northern portions of the Telkwa Mountains area, the Atna River and the Little Whitesail area. While some areas in the Telkwa Mountains will be non-motorized throughout the year, most of those areas were already deemed non-motorized under the Telkwa Caribou Recovery Plan.

In addition, the access management plan for motorized and non-motorized activities will help enhance the overall benefit to recreation users by allowing the area to offer a variety of experiences to potential users. The impact of the Morice LRMP will be to expand the area that is restricted to non-motorized activities. In particular:

- The Burnie-Lake area on the western boundary of the Morice LRMP area has become a non-motorized area (all season), and south of that polygon is the Burnie South/Morice Range, which will be non-motorized in the summer.

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[84] BC Ministry of Agriculture and Lands, *Morice LRMP* February 2007, pages 159 & 160.
[85] The Morice LRMP proposes that the Grease Trail be non-motorized in the summer as per Polygon 1 on the *Morice LRMP Motorized and Non-Motorized Recreation Access* map. See BC Ministry of Agriculture and Lands, February 2007, page 46.
[86] See: Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June 2004.
[87] Based on a visual review of the locations of MOFR recreation sites and the proposed Protected Areas and Area Specific Management zones in the Morice LRMP.

- The Telkwa Caribou Area has now become a non-motorized area during the summer, whereas parts of it were designated integrated use prior to the Plan.

- A non-motorized area during summer has been added to the east of the Telkwa Caribou Area.

- Various non-motorized areas have been added in other parts of the Morice LRMP area mainly to help protect ecological values and backcountry non-motorized recreation. The key areas that will now be non-motorized throughout the year are Atna River and Morice Mountain-Silverhorne Lake. The key areas that will now be non-motorized during the summer include: the Nanika-Kidprice and most of the area south of Tahtsa Lake. Some areas will be motorized throughout the year, but in summer, motorized use will be restricted to hard surface trails. This includes the Dome Mountain area north of Houston, the Matzehzel Mountain and the Swan Lake/China Nose area.

- The Little Whitesail South area at the southern tip of the Morice LRMP area will be designated non-motorized in winter.

The intent of the Morice LRMP is to provide a variety of high quality outdoor recreation opportunities. It is difficult to determine the net impacts on recreation of restricting motorized access in some areas. The Telkwa Range accounts for an estimated 5,000 snowmobiling days, or 42% of total estimated snowmobiling days in the Morice LRMP area (Pierce Lefebvre Consulting, June 2004, Appendix 6), and some of those visitors will be negatively impacted by the motorized restrictions. On the other hand, there may be offsetting benefits associated with non-motorized winter recreation. Some of the areas that are designated as having a high degree of suitability for non-motorized activities and hut system suitability are also highly suitable for motorized activities.

The Morice LRMP designates areas as specifically motorized, with the Sibola area being the largest. The Sibola Range is an important snowmobiling area with an estimated 2,250 visitor days per year, or approximately 19% of total estimated snowmobiling days. The Dungate area and Topley to Granisle areas, accounting for 3,500 snowmobiling days per year (29%), will also remain open to snowmobiling and other motorized activities.

Whether the benefits to the recreation sector will lead to an increase in the number of recreation days will depend on a variety of factors including:
- The regional population;
- The popularity of the Morice LRMP area recreational opportunities;
- The popularity of recreation activities for which the Morice LRMP area is well known, including freshwater angling, big game hunting, snowmobiling, ski touring and boating; and
- Camping and other facilities that may be established in the region over time.

Summary of LRMP Implications for Recreation Potential

The Morice LRMP will maintain the significant recreation values associated with the proposed Protected Areas, No Timber Harvesting areas and Area Specific Management zones.

The recreation sector will also benefit from the GMD guidelines aimed at protecting facilities, features and trails, as well as the management direction for scenic areas.

The Morice LRMP designates some areas for non-motorized uses, which may enhance the overall recreation values by enhancing the backcountry experience. While the non-motorized use areas may reduce inaccessibility for some of the motorized recreation users, the access management plan for motorized and non-motorized activities will help enhance the overall benefit of recreation users by allowing the region to offer a variety of high quality recreation experiences.

While the Morice LRMP will benefit the recreation sector, whether these benefits translate into an increase in the number of recreation days will depend on various factors relating to population, what facilities are established and maintained, and the relative popularity of the Morice LRMP area recreational opportunities.

5 Plan Area Communities/ Settlements Implications

5.1 Overview of Plan Area Communities/ Settlements

The District Municipality of Houston (Houston) and the Village of Granisle are the two main communities in the Morice LRMP area:

- Houston has approximately 3,600 residents and derives 57% of its basic income from the forest sector (Appendix 1); other important economic sectors include the public sector, other basic/construction, tourism, agriculture and mining.

- Granisle was a community of 1,430 residents in 1981, but the closure of two local mines resulted in a drop in population to the 350 people who now reside in the community. Granisle is currently primarily a retirement and recreational community.

Other unincorporated communities such as Topley, Topley Landing and Tatchet bring the Morice LRMP area population to approximately 5,200 people (2001 Census data). Appendix 1 provides more detail.

Other nearby communities that depend on Morice LRMP resources, but that are outside the Morice LRMP boundaries include Smithers, Telkwa, Burns Lake and various smaller First Nations communities. Smithers, Telkwa and Burns Lake have a combined population of 8,727 people (2001 Census).

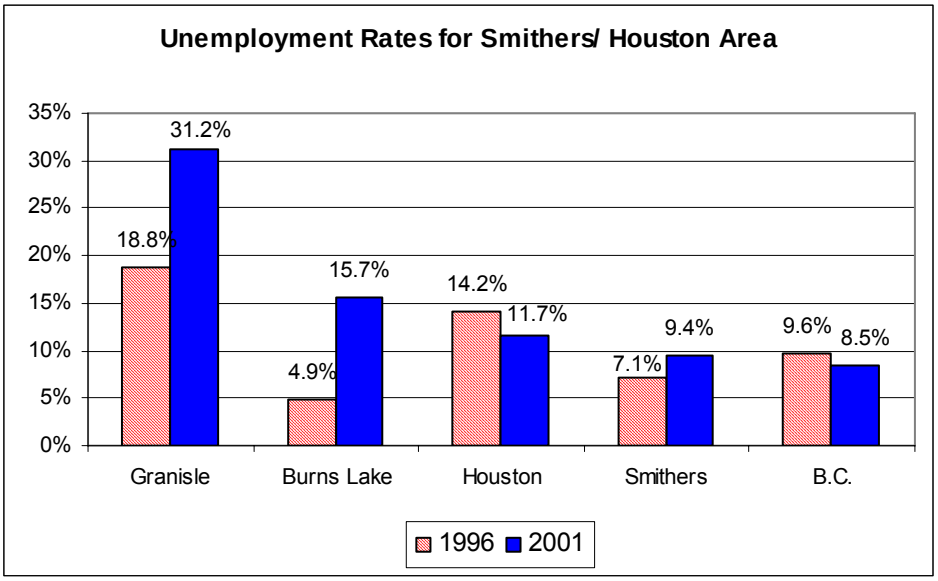
The Morice LRMP area derives 56% of its basic sector income from the forest sector, 7% from mining, 2% from tourism, and 2% from agriculture and food. The public sector accounts for 12% of basic income, although this sector in turn depends on the size of the population and economic base of the region. Other basic sectors, transfer payments and non-employment income account for the balance of basic sector income.

Recreation activities that depend on the backcountry contribute very significantly to the lifestyle offered by communities in and around the Morice LRMP area.

Unemployment rates are one indicator of the economic well being of a region. The following graph shows that the unemployment rate in Granisle in 2001 was 31.2%, up from 19% in 1996, a reflection of the difficult employment situation in that community following the closure of the local mines. The chart also shows how the unemployment rates in Burns Lake, Houston and Smithers exceed the BC average. In 2001, the unemployment rate remains higher than the BC average for

the community of Houston, but at 11.7%, it has improved significantly since reaching 14.2% in 1996.

Chart 12 Unemployment Rates for Smithers/ Houston Area, 1996 and 2001



Source: BC Stats, *Community Facts*, various communities, 1996 and 2001 (based on Canada Census data).

5.2 Forestry Implications of the LRMP for Plan Area Communities/ Settlements

The Morice Landscape Model simulations indicate that timber harvesting levels may have to decrease by 7.4% from base case levels, to remain sustainable, while implementing Morice LRMP management direction. As noted earlier, applying MOFR harvest flow policy to the 7.4% downward pressure on timber supply from the LRMP, as well as the 8.1% 'falldown' anticipated in TSR2, indicates that timber supply can be held at current levels for one decade. To accomplish this, the influence of the 'falldown' to long term harvest levels begins two decades sooner, starting in decade 3 rather than in decade 5.[88]

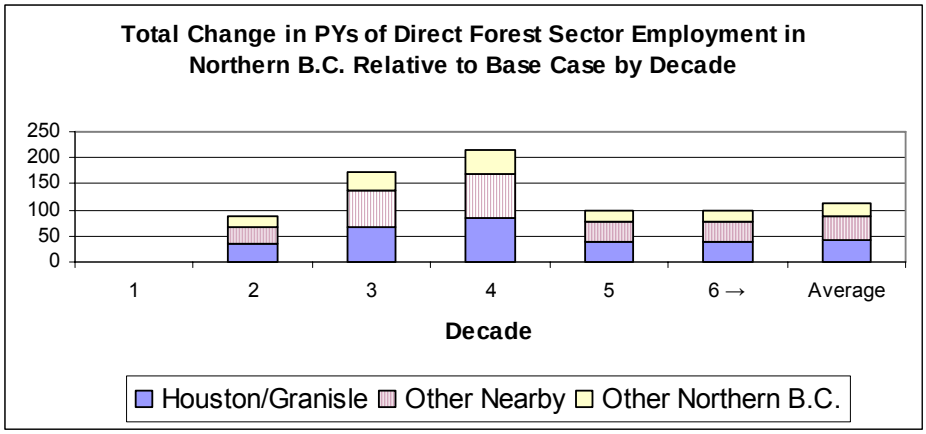
Under the harvest flow projection, there would be no loss of forest industry employment in the first decade, but this would be followed by employment levels that are lower than the base case by 88 direct PYs in the second decade, 174 PYs in the third decade, 214 PYs in the fourth decade, before settling at 98 PYs lower than base case in decades 5 and beyond.

Impacts on forest industry harvesting and silviculture employment would likely be felt mainly in Houston/Granisle, but the impacts on wood processing activities may occur primarily outside the Morice LRMP area. The two major sawmills in Houston are very large and efficient, and the loss of Morice TSA timber volumes may impact other mills in the region, as more timber is directed from outside the TSA to the Houston mills. Mills in Houston already obtain approximately one third of their timber from outside the Morice TSA.

[88] Base Case conditions with respect to the rate of mountain pine beetle infestation have altered (infestation is proceeding more rapidly than anticipated) since 2004 and the timing of impacts expected from the Morice LRMP may be significantly different than discussed in this report due to government and industry responses to the accelerating infestation in both the Morice plan area and surrounding timber supply areas.

Of the direct PYs that would be at risk, 78% would likely be in Smithers/Houston and the surrounding area (mostly logging, silviculture and wood products manufacturing) and 22% would be in other northern BC communities (mostly pulp and paper milling jobs). This is demonstrated in the following chart, and in Table 15.

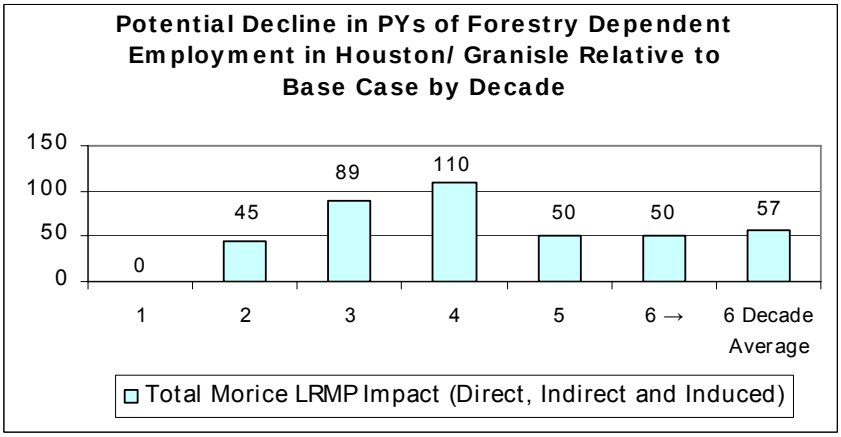
Chart 13 Change in Direct Forest Sector Employment Levels Relative to Base Case



Any job losses in harvesting and silviculture would likely be felt mainly in Houston/Granisle (an average of 44 direct PYs over the first 6 decades). After considering the indirect and induced impacts, the average loss of 44 direct PYs in Houston/Granisle might result in an average loss of approximately 57 direct, indirect and induced PYs in those communities over the first 6 decades of the projection (2% of the existing labour force). This would probably not be sufficient by itself to significantly alter the sustainability of these communities although at the margin it could have an impact on local schools and perceived choices for employment.

Under the MOFR harvest flow policy none of these job loses would occur in the first 10 years of the projection. By decade 4, Houston and Granisle employment levels would be lower by 110 PYs, which represents approximately 4% of the plan area labour force of 2,770 people[89]. If the wood processing job losses occur in Houston, rather than outside the plan area as expected, then those two communities will be affected by up to 7% of the labour force in Decade 4.

Chart 14 Change in Employment in Houston/Granisle Relative to Base Case



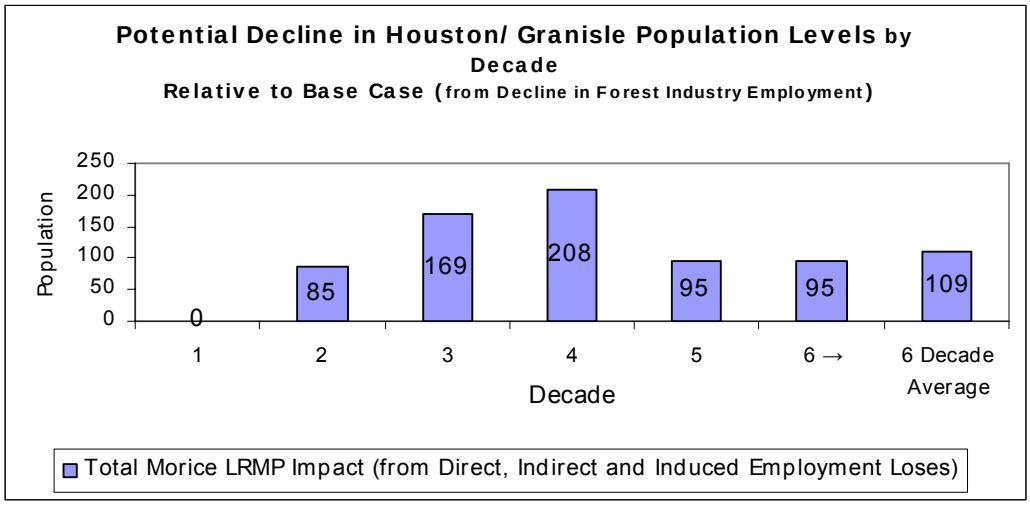
[89] Source: Pacific Analytics Inc., *Morice LRMP Base Case SEA*, page 17.

The employment decline in Decades 3 and 4 (caused partly by acceleration of the timber supply 'falldown') could become significant to the community social and physical infrastructure. On the other hand, delaying the impacts of harvest reduction until Decade 2 will provide more time for the communities to plan for the decline in employment in the forest sector, and possibly begin to experience increases in employment in sectors expected to benefit from the LRMP. It should be noted once again here that the response to the mountain pine beetle infestation is likely to substantially alter application of MOFR harvest flow policy to the 7.4% downward pressure on timber supply caused by the Morice LRMP. The timing of employment impacts is therefore likely to be substantially altered from what is outlined here.

In communities such as Granisle and Houston, a loss of employment often results in the out-migration of workers and their families. The existing population to labour force ratio is 1.89 persons per individual in the labour force (based on the 2001 ratio of population (5,343) to labour force (2,770) for the Morice LRMP area). If it is assumed that everyone who loses their job moves away and there are no offsetting job gains in other sectors, then applying this ratio to the forestry dependant employment loss projections above results in an average population loss (relative to base case projections) of 109 people over the first 6 decades of the projection. Population losses (relative to base case) peak at 208 people in decade 4 due to the earlier commencement of the 'falldown' adjustment in the LRMP harvest flow scenario.

The next chart shows population impacts for Granisle/Houston. The population impacts will be more significant than those shown on the graph if some or all of the wood manufacturing jobs lost are in Houston. As mentioned above, this assumes that lumber mills in other nearby communities will be affected before the mills in Houston.

Chart 15 Change in Houston/Granisle Population Levels by Decade Relative to Base Case



The following table shows the detailed forest employment impact data incorporated in the above charts.

Table 12 Employment Implications of the Potential Decline in Timber Supply

Estimated Employment and Population Impacts of Morice LRMP	Current PYs from Morice Area Timber	Decade 1	2	3	4	5	6 and thereafter	Annual Average for 6 Decades
Harvest ('000 m³)								
Harvest Reduction		0	119	236	291	133	133	152
Decade to Decade Change		0.0%	6.1%	6.4%	3.2%	0.0%	0.0%	0
Change Relative to Base Case		0.0%	6.1%	12.0%	14.8%	7.4%	7.4%	7.9%
Direct Employment Reduction (PYs)								
Decade to Decade Change		0	88	86	40	0	0	
Total Change Relative to Base Case		0	88	174	214	98	98	112
Total Change in Direct Employment: Morice LRMP Relative to Base Case (PYs)								
Harvest/ Silv.Houston/Granisle	567	0	34	68	84	38	38	44
Harvest/ Silv. Nearby Communities	76	0	5	9	11	5	5	6
Wood Products Proc. Regional	487	0	30	59	72	33	33	38
Sub-Total	1,131	0	69	136	168	77	77	88
Pulp & Paper - Northern Interior	312	0	19	38	46	21	21	24
Other BC.	0	0	0	0	0	0	0	0
	1,442	0	88	174	214	98	98	112
Employment Impact on Houston/Granisle - Total Change Relative to Base Case								
Direct	567	0	34	68	84	38	38	44
Indirect/ Induced	175	0	11	21	26	12	12	14
Total	742	0	45	89	110	50	50	57
% of Labour Force for Houston/Granisle	26.8%	0.0%	1.6%	3.2%	4.0%	1.8%	1.8%	2.1%
Population Impact on Houston/Granisle:								
Total Morice LRMP Impact		0	85	169	208	95	95	109

Notes: Does not add due to rounding.

The key assumptions are as follows:

1. Approximately 90% of the harvesting and silviculture employment impacts are assumed to occur in Houston and Granisle, with the remainder occurring in nearby communities outside of the Morice LRMP area.
2. Wood processing employment impacts are assumed to occur in other nearby communities. The pulp and paper processing employment impacts are assumed to occur in Northern Interior communities (Kitimat, Prince George or Prince Rupert).
3. The employment impact in the rest of the province would be a decline in indirect and induced employment.

5.3 Other Implications of the LRMP for Plan Area Communities/ Settlements

The Morice LRMP will likely have a generally positive impact on tourism and recreation values, which should support the marketability and strategic diversification initiatives of Houston and Granisle. It is difficult, however, to estimate the growth potential of the backcountry tourism sector in the Morice area and the extent to which the Morice LRMP will contribute to that growth.

Backcountry tourism (including guided hunting and angling) accounts for 43 PYs of direct employment in the Morice LRMP area, and a very substantial expansion of that sector would be required to offset the potential decline in harvesting and silviculture employment noted above.

Metal mining is an important element (82 local direct PYs) in the limited economic diversity that currently exists in the Morice LRMP area. The Morice LRMP should have no impact on current mining operations (Huckleberry Mine), but may enhance the likelihood of future mineral exploration and development through certainty of access to 92% of the land base. The benefit from increased land use certainty is counterbalanced somewhat by the designation of 8.5% of the High and Very High metallic mineral potential lands as Protected Areas.

Measures of community sustainability or community resilience go beyond purely economic considerations. The Morice & Lakes Innovative Forest Practices Agreement (IFPA) has developed a list of indicators and prepared an assessment of community sustainability for the Morice and Lakes IFPA region. This framework is useful to illustrate some of the potential community impacts of the Morice LRMP in table format.

Table 13 Implications of the LRMP for Long Term Community Sustainability/Resilience

Indicators of Community Sustainability/ Community Resilience	Impact of Morice LRMP
Human Capital • includes education, trades training, perceived choices for employment, and education opportunities	The suggested timber flow policy suggests that there will be no loss of forest employment in decade 1, but this will require significant losses in decades 3 and 4 rather than in Decade 5 where the 'falldown' effect was expected to take place under TSR-2. The loss of employment in Decade 2 would probably not be sufficient by itself to significantly alter the sustainability of the community although at the margin it could have an impact on local schools and perceived choices for employment. While the harvest flow projection may impact the Houston/Granisle workforce by as much as 7% in Decade 4, delaying the impacts of harvest reduction until Decade 2 will provide more time for the communities to plan for the decline in employment in the forest sector.
Economic Capital • includes income, labour force recruitment and retention, access to government services, transportation services, etc.	There will likely be no impact in Decade 1. Thereafter, negative impact on forest industry employment is unlikely to be compensated by growth in other sectors at least in the medium term; wood processing employment impacts may be felt outside the LRMP area as sawmills in Houston are very large and efficient.
Social Capital • includes number of community volunteer organizations, in/out migration, etc.	The loss in forest employment after Decade 1 may result in people leaving the Morice LRMP area. Under the harvest flow projection, the lower level of local employment envisioned for decade 4 may result in over 200 people less in local communities than under the base case projection although this may be ameliorated to some degree by LRMP facilitated growth in tourism and commercial recreation.
Ecological Integrity	Increase in protected areas and No Timber Harvesting zones as well as

Indicators of Community Sustainability/ Community Resilience	Impact of Morice LRMP
• including area of protected areas, air quality, visible stewardship, species of concern	other area specific and general management direction targeting ecological integrity[90].
Economic Vitality • including economic diversity, income leakage, incidence of low income, unemployment, entrepreneurship, etc.	May lead to increased economic diversity, but also increased unemployment for forest sector workers.
Civic Vitality • including satisfaction with local governance, volunteerism, etc.	Greater sense of local control over the use of land and resources; stakeholder communication and consensus.
Physical and Mental Health • including health care, substance abuse, etc.	The loss in forest sector employment may lead to some increase in health issues associated with unemployment.
Recreational Opportunities • including the quality of outdoor and indoor recreational opportunities	Provides for an ongoing variety of high quality outdoor recreation experience, and addresses developing conflicts among motorized/non-motorized recreation.

Summary of LRMP Implications for Community Sustainability

Community capacity building, local empowerment, resource inventory information and stakeholder consensus are key benefits of the LRMP to plan area communities.

The Morice LRMP is likely to have an overall 7.4% negative impact on timber supply. Applying MOFR harvest flow policy to the 7.4% downward pressure on timber supply from the LRMP, as well as the 8.1% 'falldown' anticipated in TSR2, indicates that timber supply can be held at current levels for one decade. To accomplish this, however, the influence of the 'falldown' to long term harvest levels begins two decades sooner, starting in decade 3 rather than in decade 5.

The direct forest sector PYs at risk in harvesting and silviculture are likely to occur in Houston/Granisle. The loss of wood processing employment may be felt in other nearby communities rather than in Houston. Throughout the 6 decades and beyond, some 78% of direct PYs at risk are likely to be in Smithers/Houston and surrounding area (logging, silviculture and processing) and 22% in other Northern communities (pulp and paper). Regional employment levels will be lower by 174 direct forest sector PYs in decade 3 and 214 direct forest sector PYs in Decade 4 (compared to the average decline of 112 direct forest sector PYs over the first 6 decades).

Under the harvest flow policy, there would be no employment loss in Houston/Granisle in Decade 1. Employment levels would then be lower than under the Base Case by 45 direct, indirect and induced PYs of employment in Decade 2, 89 PYs in Decade 3, 110 PYs in Decade 4 and 50 PYs

[90] For an assessment of the ecological benefits see: Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June, 2004.

thereafter. Impacts would be greater if the loss of wood processing jobs associated with reduced timber supply occurs in Houston (could be up to 7% of the Houston/Granisle labour force).

The corresponding negative impact on population levels (relative to the base case projection) for Houston/Granisle range between 0 in Decade 1 and 208 people in Decade 4, for an average of 109 people throughout the first 6 decades of the projection.

The Morice LRMP will benefit the tourism sector, but a doubling in existing backcountry tourism activities would be required by Decade 2 to offset the minimum loss of 45 PYs in Houston/Granisle that could result from the decline in timber supply. By Decade 3, the backcountry tourism sector would have to be approximately 3 times greater than what it is today to offset the decline in forest sector employment projected for that decade.

The impacts on community resilience are mixed, with benefits such as greater ecological integrity, greater economic diversity, greater local governance and maintaining recreation values, counterbalancing the socio-economic costs associated with the jobs at risk.

6 Specific First Nations Implications

6.1 Overview of First Nations Communities

The socio-economic analysis recognizes that both First Nations and non-First Nations communities depend on the same land based resources in the Morice LRMP area for wildlife, fisheries, forestry, mining, tourism etc. However, First Nations values, rights, and circumstances are often quite different than those of the rest of the population. This section, as well as Appendix 9 of the 2004 SEEA of the Table Recommended Plan[91] provide an overview of specific First Nations concerns in the Morice LRMP area that have not already been covered in other sections of the Socio-Economic Analysis.

First Nations with an interest in the Morice LRMP area include the Office of the Wet'suwet'en, the Lake Babine Nation (including the Nedo'ats Hereditary Chiefs), the Wet'suwet'en First Nation (Carrier Sekani Tribal Council), the Cheslatta Carrier Nation and the Yekooche First Nation. More information is available on Wet'suwet'en interests and concerns than is available for the other First Nations or Tribal Councils.

The Bulkley Nechako Regional District includes approximately 41,000 people of which approximately 6,000 are of First Nations ancestry (BC Stats, based on 2001 Census Canada data):

- The Office of the Wet'suwet'en estimates that it represents over 5,000 Wet'suwet'en people; of these, 2,362 people were registered in 2002 under the Hagwilget Village or Moricetown groups with Indian and Northern Affairs Canada.

- The Lake Babine Nation (including the Nedo'ats) has over 2,051 members (INAC 2002); the Lake Babine Nation communities within or on the border of the Morice LRMP include Tachet (pop. 86 – Census 2001) and Fort Babine (pop. 77 – Census 2001).

[91] Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, June 2004, Appendix 6.

- The Carrier Sekani Tribal Council (CSTC) represents several member bands in treaty negotiations (population of 12,000 estimated in Statement of Intent) including the Burns Lake Indian Band (INAC pop. 88) and the Wet'suwet'en First Nation (INAC pop. 208); Statement of Intent boundaries for the CSTC cover some 95,000 square kilometres of BC including two thirds of the Morice LRMP area.

- The Cheslatta Carrier Nation comprises some 286 registered band members (INAC 2002) centered on the south shore of Francois Lake.

- The Yekooche First Nation has 175 registered band members (INAC 2002), most of whom reside near Stuart Lake to the east of the Morice LRMP area.

First Nations communities are increasingly active in the forest industry, through various types of timber tenures and joint venture manufacturing operations. The Office of the Wet'suwet'en is actively pursuing eco-cultural tourism opportunities through the development of tourism trail networks, and have identified several areas of opportunity including Morice Lake, Owen Lake, Nadina Mountain, Nanika-Kidprice, Thautil River, China Nose, Nadina River, McQuarrie Lake, Burnie Lakes and Atna Lake.

First Nations have a vital economic and cultural interest in salmon populations and fish habitat in the Morice LRMP area, in wildlife populations supporting hunting and trapping activities, as well as in botanical forest products and culturally significant ecosystems.

First Nations concerns that may be addressed by the Morice LRMP include:

- The rate of road development and timber harvesting
- Degradation or destruction of cultural heritage sites
- Degradation of culturally significant ecosystems and botanical forest products
- Degradation of fish and wildlife habitat
- Preservation of opportunities for eco-cultural tourism development
- Preservation of water quality

6.2 Base Case Management Regime

Some of the key elements of the base case management regime pertaining to First Nations values and interests are as follows:

- The Supreme Court of Canada decision in the Delgamuukw case in 1997 (started by the Gitxsan Nation and the Wet'suwet'en Nation in 1984) confirmed the existence of aboriginal title in BC. The title is a right to the land itself, not just the right to hunt, fish or gather, and when dealing with Crown land, the government must consult with and may have to compensate First Nations whose rights are affected.[92]

- Two landmark rulings in the BC Court of Appeal, Haida and Taku, confirm the provincial government must properly consult with and accommodate the interests of First Nations, pre-

[92] Source: *A Lay Person's Guide to DELGAMUUKW*, BC Treaty Commission, http://www.bctreaty.net/files_2/pdf_documents/delgamuukw.pdf

treaty, before proceeding with development on their traditional territories.[93]

- Cultural sites dated prior to 1846 are protected under the Heritage Conservation Act.
- The Morice Forest District (now managed as part of the Nadina Forest District) has developed a policy for managing pre-1846 and post-1846 culturally modified trees.
- An April 2000 political accord between The Office of the Wet'suwet'en, Canada and British Columbia, commits them to work together on land, resource and economic development. Initiatives under the accord have focused on the forest sector, tourism, land-use planning and fisheries. Flowing from it, a protocol agreement brought together four local forest companies to work collectively to develop forestry-related economic initiatives for and with the Wet'suwet'en.
- The evolving Wet'suwet'en Territorial Stewardship Plan includes a cultural heritage database and GIS spatial analysis at the House Territory level.
- The Forest and Range Practices Act objective set by government for cultural heritage resources is to conserve, or, if necessary, protect cultural heritage resources that are (a) the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and (b) not regulated under the *Heritage Conservation Act*.
- A co-management agreement between The Office of the Wet'suwet'en and Houston Forest Products, to manage the 'Nadina Petition Area'.

6.3 LRMP Implications for First Nations

This section summarizes the distribution of some First Nations cultural values across the various resource management zones designated in the Morice LRMP as well as the impacts of GMD, PAs and Other Area Specific Management zones on First Nations.

6.3.1 Area Statistics for First Nations Cultural Values

Area Statistics were run against two sets of archaeological data:

- The Office of the Wet'suwet'en database of cultural trails and sites, covering the southern 74% of the Morice LRMP area up to approximately 15 kilometres north of Topley.
- The Archeological Overview Assessment (AOA) data, which includes known sites, as well as mapped areas of high, moderate, or low risk of finding an unknown archaeological site. The AOA is based on field confirmed data, input from First Nations and other inventories and has been used by major licensees and others when developing timber harvesting plans.[94]

The actual distribution of First Nations sites and trails across the Morice LRMP landscape may not be completely represented by these data. The Office of the Wet'suwet'en database is thought to be about 75% complete, and the AOA data is added to as new sites are discovered.

[93] Source: BC Treaty Commission Web Site : http://www.bctreaty.net/files_2/issues_forestry.html#2
[94] Source: Horn, Hannah and Gregory C. Tamblyn, *Morice Planning Area Background Report*, pages 41 and 42.

There may be some bias (particularly with the AOA data) in the data collection towards more developed areas, with more remote or difficult to access sites or trails being under represented. In addition, these data do not accurately reflect the results of government to government discussions which shifted the designation of some areas between No Timber Harvest and Protected and resulted in a net increase in the total amount of Protected area.

Table 14 Morice LRMP Resource Management Zones and Archaeological Values

Morice LRMP – (Area Specific Management Version 5)	Total Area (hectares)	Protected Area	No Timber Harvest	Other Area Specific	GMD	Total
Plan Area	1,501,663 ha	8.3%	18.1%	9.4%	61.9%	97,7%[1]
Wet'suwet'en Cultural Heritage						
Kilometres of Trail	1,115 km	8.0%[2]	10.0%[2]	25.8%	56.1%	100%
Sites	97 sites	12.4%[2]	15.5%[2]	37.1%	35.1%	100%
Archaeological Overview Assessment						
High Risk of Finding Unknown Site (ha)	391,331 ha	5.6%[2]	15.8%[2]	9.0%	69.6%	100%
Sites	366 sites	1.1%[2]	6.6%[2]	14.8%	77.6%	100%

Source: Pierce Lefebvre Consulting, *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, June 2004, Table 17, Page 57.
Notes. 1. Private land occupies 2.3% of the total Plan Area. 2. Based on 2004 LRMP Table recommended boundaries. .

The following sections interpret these chart figures.

6.3.2 Implications of General Management Direction

Several elements of the Morice LRMP general management direction package should benefit the particular values and interests of First Nations.

- Cultural Heritage GMD includes provisions to reinforce base case conservation and preservation of archaeological sites and cultural heritage resources, as well as to maintain or restore First Nations access to cultural heritage resources and traditional use areas.

- Botanical Forest Products GMD includes objectives and associated management direction to maintain or enhance the distribution, abundance and access to culturally important botanical species. There is also a provision to manage for organic certification of culturally important botanical species and direction to limit the use of pesticides.

- Consultation GMD provides for a consultation framework that would operate in addition to Provincial requirements for consultation with First Nations. First Nations representatives have indicated that while consultation is generally beneficial, it comes with some costs in terms of capacity to deal with issues requiring consultation. Specific mineral exploration and development consultation and accommodation principles are outlined in the plan, which should assist mining companies and First Nations communities in negotiating benefits agreements in respect of mineral development on First Nations traditional territories.

- Ecosystem GMD, including management for biodiversity, water resources, fish/fish habitat, and wildlife/wildlife habitat generally supports First Nations values and interests.

- Recreation, Visual and Tourism GMD provide support for First Nations interests in pursuing economic opportunities to develop various types of tourism products.

6.3.3 Implications of Protected Areas and Area Specific Management Zones

Protected Areas can shield First Nations cultural heritage values from industrial development, but they can also constrain some types of commercial development that First Nations may wish to pursue. The AOA database shows very few (1.1%) cultural heritage sites in the Protected Areas proposed by the Morice LRMP, while The Office of the Wet'suwet'en database indicates a higher proportion of sites (12.4%) and a similar proportion of trails (8.0%) in Protected Areas than the 8.3% of the total land base in Protected Areas[95].

The Morice LRMP expresses objectives and management direction for all Protected Areas, which should guide the development of individual management plans for each Protected Area. Included in these objectives are the maintenance and protection of cultural heritage values, recognizing hunting and angling as an acceptable use, and encouraging economic opportunities for small, locally based commercial recreation. This management direction for Protected Areas fits well with the concerns, interests and aspirations of First Nations noted above.

Protected areas with cultural heritage values as a significant factor in their candidacy include Burnie–Shea Lakes (Tazdli Wiyez Bin), Morice Lake (high fisheries values in the Morice watershed are integral to the Wet'suwet'en people and their culture), Nadina Mountain (specific management direction for cultural heritage), and Old Man Lake (specific management direction for cultural heritage).

Area Specific Management Zones are classified into three types for this analysis: No Timber Harvest areas, Other Area Specific Management zones and the Water Management Area.

The No Timber Harvest zones provide a high level of protection of forest based First Nations cultural heritage values. No Timber Harvest Areas with particular emphasis on First Nations cultural heritage values include Morice Range, Swan Lake – China Nose, Nadina River floodplain, Grease Trail 100 metre core, Babine East Arm 30 metre reserve zone, Morrison Lake 30metre reserve zone, and Nanika River floodplain.

Other Area Specific Management zones are typically managed for high biodiversity emphasis, mature and old seral stage targets and/or access restrictions. These management provisions should help to maintain or preserve culturally significant ecosystems and other First Nations values. Areas with particular emphasis on First Nations values include Nadina/Owen (to be managed to respect Office of the Wet'suwet'en cultural values), Nanika River buffer, Morrison Lake 500 metre management zone, Grease Trail 500 metre buffer, Nadina River 500 metre buffer and the Le Talh Giz (Old Fort Mountain) Area Specific Resource Management Zone. .

The Water Management Zone, which overlaps several other areas specific management zones in the western portion of the plan area, provides additional emphasis on the preservation of water quality and quantity in key watersheds supporting very culturally significant fisheries.

[95] As noted in the footnote to Table 14, these figures for cultural sites and trails may not be accurate (and if anything are likely to understate the real values) because they are based on the protected area boundaries recommended by the LRMP Planning Table in 2004.

Wet'suwet'en House Territories

The Wet'suwet'en Territorial Stewardship Plan[96] is concerned with the management of cultural and ecological values across 38 Wet'suwet'en house territories, 22 of which are substantially within the Morice LRMP area. The table below gives some indication of how the Morice LRMP area specific management zones overlap each of the house territories, and the degree to which each house territory benefits from additional protection (over and above GMD) of ecological and cultural values.

Clan	House Territory (1)	Morice LRMP Zonation (2)	Additional Protection (3)
Gilseyu	C'iniggit Nenikekh G2	Entirely NTH or PA	High
Gilseyu	Yin Bi Wini G3	Mostly GMD; ASM (Twinkle-Horseshoe); some NTH	Low
Gilseyu	Wesel Bin G4	Partly NTH; partly GMD	Moderate
Gilseyu	Talbits Kwah G6	Partly NTH; partly Thaitil –Gosnell ASM; some GMD	High
Gilseyu	Tac'its'olh'en G7	Mostly GMD; some Nadina River ASM	Low
Gilseyu	Gguzih Keyikh G8	Some NTH; remainder GMD	Moderate
Gilseyu	Tsec'ulh Tesdliz Bin G9	Mostly NTH; small amount of GMD	High
Laksilyu	Tse Zul L2	Some PA; some Bulkley River ASM; mostly GMD	Moderate
Laksilyu	'Ilh K'il Bin L3	Partly ASM (Matzehtzel Mtn. And Bulkley River); rest GMD	Moderate
Laksilyu	Nelgi'l'at L7	Mostly PA; some ASM and GMD;	High
Laksilyu	Nilgi Cek L9	Some ASM; remainder GMD	Low
Laksamishu	Lho Kwah S2	Entirely NTH	High
Laksamishu	C'idi To Stan S3	Mostly GMD; some ASM	Low
Laksamishu	Ggusgi Be Wini S4	Mostly GMD; some Bulkley River ASM	Low
Laksamishu	Misdzi Kwah S5	Entirely GMD;	Low
Tsayu	Tlhdzi Wiyez Bin T1	Mostly PA; some NTH; small amount of GMD	High
Tsayu	Dets'inegh T2	Mostly GMD, small amount of NTH	Low
Tsayu	Nelhdzi Tezdli Bin T3	Entirely GMD	Low
Gitdumden	Lhudis Bin W2	Some NTH; some PA; some ASM (Nanika River, Morice River); about half GMD	Moderate
Gitdumden	Bi Wini W4	Partly ASM (Nadina-Owen, Morice River, Morice Mtn.);partly GMD	High
Gitdumden	Bikh C'idilyiz Ts'anli W5	Mostly GMD; small amount of ASM (Morice River)	Low
Gitdumden	Ts'in K'oz'ay W6	Mostly GMD; portions of 4 different ASM zones	Low

Notes:

1. Source; Office of the Wet'suwet'en Web Site: http://www.wetsuweten.com/wet/ho_map2.htm, April 2004
2. PA = Proposed Protected Area, NTH = No Timber Harvest Area, ASM = Other Area Specific Management, GMD = General Management Direction
3. *Pierce Lefebvre Consulting* subjective assessment of the degree to which the area specific management zones provide additional protection for First Nations cultural and ecological values, over and above general management direction provisions.

[96] Office of The Wet'suwet'en, *The Wet'suwet'en Territorial Stewardship Plan: A First Nations Cultural Heritage Initiative*, updated October 2003.

Summary of LRMP Implications for First Nations

The Morice LRMP should better accommodate First Nations values and interests than base case management.

Cultural Heritage GMD reinforces the base case conservation of archaeological sites and cultural heritage resources. Other GMD that will benefit First Nations pertains to botanical forest products, consultation, recreation and ecosystems.

The objectives for the proposed PAs to maintain and protect cultural heritage values, recognize hunting and angling as acceptable use, and encourage economic opportunities for small commercial backcountry tourism ventures, are consistent with First Nations values and concerns.

Many of the Area Specific Management zones provide specific management direction for First Nations cultural heritage values, while others are managed for high biodiversity, seral stage and access restrictions, which are also consistent with First Nations values and concerns. The Water Management Area includes management direction to help assure protection of salmon habitat and water quality over an extensive area

There are 22 Wet'suwet'en house territories that are substantially within the Morice LRMP area. The Morice LRMP Protected Areas and Area Specific Management zones provide a high degree of protection (additional to GMD) for cultural heritage values in 7 of these house territories, and a moderate degree of protection in another 5. Moreover, each Wet'suwet'en clan has at least one house territory that has a high degree of additional protection of cultural heritage values.

7 Environmental Values Implications

The BC Ministry of Sustainable Resource Management (BC MSRM) commissioned A. Edie and Associates to undertake an Environmental Risk Assessment (ERA) of the Morice LRMP[97] to compare the levels of risk to environmental values under LRMP management direction, relative to the risk levels existing under base case management.

The ERA focuses on three main issues:

- The extent to which ecosystems are protected from industrial activity in Protected Areas and No Timber Harvest Areas,
- The extent to which industrial activities on the landscape are expected to lead to deviation from natural disturbance patterns or the Range of Natural Variation (RNV) for the Morice landscape, and
- The extent to which industrial and recreation activities are expected to lead to changes in habitat availability/suitability for wildlife species, plant species and aquatic species.

The 2004 ERA was prepared prior to completion of Government to Government (G2G) negotiations between British Columbia and the Office of the Wet'suwet'en, Lake Babine Nation (Nedo'ats) and Yekooche First Nation. The ERA summary presented here has been prepared by

[97] Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June 2004.

A. Edie and Associates in light of the G2G agreement and additional background information on the updating of the 2004 analyses is provided in Appendix D.

7.1 Ecosystem Representation

Ecosystem representation in Protected Areas and No Timber Harvest areas is assessed at both the plan area level (Morice LRMP boundaries – 1.5 million hectares) and the regional level (the area covered by all ecosections that have any significant overlap with the Morice LRMP area – 5.5 million hectares). The following table compares ecosystem representation under base case management and Morice LRMP management for two classifications of ecosystems. Ecosection classifications are based on climatic and physiographic characteristics, while Biogeoclimatic Zones are based on vegetation characteristics.

Table 15 Regional and Morice LRMP Area Ecosystem Representation in Protected Areas

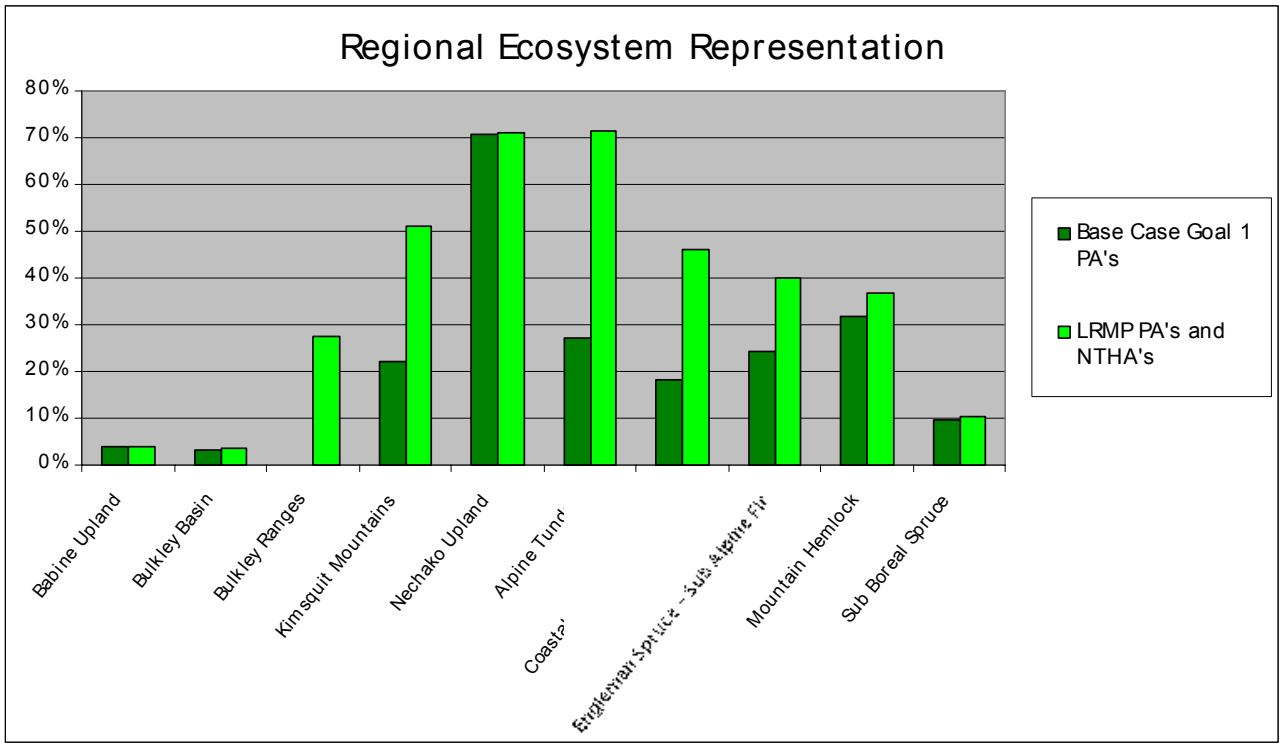
	Regional Representation				Morice LRMP Area Representation			
Ecosystem Category	Regional Ecosection Area (ha)	Base Case PAs (%)	With LRMP PAs (%)	With LRMP PAs & No Timber Harvest Areas (%)	Morice LRMP Area (ha)	Base Case PAs (%)	With LRMP PAs (%)	With LRMP PAs & No Timber Harvest Areas (%)
Ecosections[1]								
Babine Upland	2,001,852	3.8	4.0	4.0	419,415	0.0	1.4	1.4
Bulkley Basin	1,340,874	3.3	3.3	3.5	253,994	0.1	0.3	1.1
Bulkley Ranges	598,783	0.0	10.7	27.6	436,057	0.0	14.6	37.9
Kimsquit Mountains	758,474	22.3	28.8	51.0	223,351	0.0	22.2	97.4
Nechako Upland	754,670	70.7	71.0	71.0	157,174	0.1	1.6	1.6
Biogeoclimatic Zones[2]								
Alpine Tundra	358,838	27.2	37.5	71.5	186,779	0.0	19.7	85.0
Coast. West. Hemlock	156,248	18.2	29.2	46.2	45,451	0.0	37.6	96.1
Eng. Spr.– S.A. Fir	1,038,907	24.2	29.3	39.9	380,353	0.0	13.9	43.0
Mountain Hemlock	159,068	31.9	32.0	37.0	8,046	0.0	1.8	100.0
Sub Boreal Spruce	3,536,997	9.8	10.3	10.4	879,447	0.1	2.1	2.4

1. Table does not include small areas of the Manson Plateau, Nass Mountains, and Kitimat Ranges ecosections.
2. Parkland forest subzones are included in the Alpine Tundra Biogeoclimatic Zone.

PA's = Protected Areas; NTHA's = No Timber Harvesting Areas.

PAs and No Timber Harvest Areas under the Morice LRMP add significantly to regional representation of the Bulkley Ranges and Kimsquit Mountains ecosections. Babine Upland and Bulkley Basin ecosections, which have relatively low protected area representation under the base case, would not receive significantly greater representation under the Morice LRMP.

Chart 16 Regional Ecosystem Representation



All biogeoclimatic zones have significant representation under the base case, with Sub Boreal Spruce (SBS) being the most extensively occurring zone in the region and the least represented. The Morice LRMP will not contribute significantly to general SBS representation, but it will make a significant contribution by providing enhanced protection for a particular subzone and variant within the SBS zone (red listed cottonwood – red osier forests on the Morice River floodplain).

7.2 Risk to Environmental Values

Levels of risk to environmental values are expressed using constructed scales (Low, Moderate, High) and are assessed using a combination of subjective professional judgement and computer simulation tools. The Morice Landscape Model[98] provided 250 year simulations of landscape conditions, which were used to assess the expected long term impacts of LRMP management direction on various environmental values.

A summary of the risk assessment, by environmental value for Base Case Management and the Final Land Use Recommendations, is presented in the following table.

[98] Gowlland Technologies et al., *Morice Landscape Model*, December 2, 2003.

Table 16 Environmental Risk Assessment Summary

Environmental Value	Base Case Management	LRMP Management
Ecosystem Representation	• < 0.1% of the Plan Area in Protected areas • 0.5% of the Plan Area in No Timber Harvest Areas Overall risk: High	• 8.3 % of the Plan Area in Protected Areas (including 2.6% of Plan Area THLB) • 18.0% of the Plan Area in No Timber Harvest Areas (including 1.0% of the Plan Area THLB) Overall risk: Moderate-high
Coarse Filter Biodiversity	• < 0.1% of the Plan Area in Protected areas • less old forest on managed landscape • 7.25% retention of Wildlife Tree Patches in logged blocks	• New Protected Areas or No Timber Harvest Areas over 26.3% of the Plan Area. • High Biodiversity Areas[99] over a further ~6% of the Plan Area (~9% of the forested area). • Wildlife Tree Patch Retention of an area equivalent to 7.25% of all logged blocks, plus temporary retention of additional unlogged forest on large cutblocks • Extended rotation on a portion of large cutblocks • Development and implementation of Best Management Practices for Coarse Woody debris. • Retention of the deciduous component of managed forests • Development of Best Management Practices for management of tree species diversity • Use of natural regeneration on a portion of logged land
	Overall risk: High in areas developed for forestry.	Overall risk: Moderate-high in areas developed for forestry.
Grizzly Bear	No specific management of habitat availability or access-related mortality. Overall decline in suitability and value of seasonal habitats as a result of timber harvest.	• Checks to be made for spring and salmon foraging sites during lower level planning • Limitations to timber harvest near identified spring and salmon foraging sites • Development and implementation of strategies for managing access related mortality • Inclusion of some important grizzly bear habitat within Protected Areas or No Timber Harvest Areas • Overall decline in suitability and value of seasonal habitats as a result of timber harvest, but slightly less decline than under Base Case

[99] These areas result from management associated with various Area Specific Management Zones, and may contribute to the overall Plan Area target of 10% to 20% High Biodiversity Emphasis Area (HBEA) on the forested landscape (BC Ministry of Agriculture and Lands, *Morice LRMP*, February 2007, page 87).

Environmental Value	Base Case Management	LRMP Management
	Overall risk: High in roaded portions of Plan Area, low-moderate in remote unroaded portions.	Overall risk: High in roaded portions of Plan Area, low-moderate in remote unroaded portions; however, generally lower risk than under Base Case Management.
Northern Caribou	Limited timber harvest in Telkwa herd habitat.	• Limited timber harvest in Telkwa and Takla herd habitats. • Checks to be made for summer and calving habitats during lower level planning • Limited timber harvest near identified summer and calving habitats
	Overall risk: Uncertain as it will likely depend on long term predation trends.	Overall risk: Uncertain as it will likely depend on long term predation trends.
Fisher	No specific provisions.	• Protection of den trees. • Inclusion of potentially important riparian habitats in Morice River No Timber Harvest Areas. • Better management of deciduous forests important to this species by maintaining representation of natural tree species diversity and deciduous ecosystems through time.
	Overall Risk: Uncertain due to lack of information on local populations.	Overall Risk: Uncertain due to lack of information on local populations.
Northern Goshawk	Due to timber harvest, general reduction in habitat likely to be occupied.	• Due to timber harvest, general reduction in habitat likely to be occupied. • Protection of known nest/fledging sites, as and when identified. • Inclusion of habitat in Protected and No Timber Harvest Areas.
	Overall Risk: Moderate-high	Overall Risk: Moderate-high
Mountain Goat	No specific provisions.	• Access controls near isolated populations. • Limited timber harvest in important shelter habitats. • Inclusion of habitat in Protected and No Timber Harvest Areas. • Reduced risk of disease transfer from domestic animals.

Environmental Value	Base Case Management	LRMP Management
	Overall risk: Low for most populations, Moderate-high for small isolated populations near Morice and Nadina Mountains.	Overall Risk: Low for most populations, Moderate for small isolated populations near Morice and Nadina Mountains.
Moose	No specific provisions.	Development and implementation of Best Management Practices for management of habitats providing thermal cover, screening, and forage production.
	Overall risk: Low	Overall risk: Low
Marten	No specific provisions.	No specific provisions. Inclusion of habitat in Protected and No Timber Harvest Areas. Greater amounts of old forest, and specific management of coarse woody debris should reduce risk to Marten relative to the Base Case.
	Overall risk: Low - moderate	Overall risk: Low – moderate, but slightly lower than Base Case due to management of forest age, and inclusion of habitat in Protected and No Timber Harvest Areas.
Bull Trout	No specific provisions. Species benefits from general management of riparian areas.	• Management of special spawning areas, natal areas, and staging locations. • Species benefits from general management of riparian areas, aquatic ecosystems, and fish habitat. • Management of access to sensitive staging and spawning areas. • Enhanced hydrological protection in the upper Morice Water Management Area.
	Overall risk: Uncertain	Overall risk: Uncertain, but lower than under Base Case management.
Riparian Ecosystems	Assumed equivalent to Forest Practices Code	• Assumed equivalent to Forest Practices Code • Development of Best Management Practices for management of riparian areas. • Maintenance of function integrity of lakeshores and colluvial and alluvial fans. • Enhanced hydrological protection in the Morice Water Management Area
	Overall risk: Uncertain	Overall risk: Low - Moderate
Rare Ecosystems	No specific provisions.	• Direction to reduce risk to Red and Blue Listed ecosystems. • Protection of large area of Red Listed Cottonwood-Red Osier ecosystem along Morice River.
	Overall risk: High	Overall risk: Moderate

Environmental Value	Base Case Management	LRMP Management
Aquatic Ecosystems and Fish Habitat	Assumed to meet or exceed protection accomplished by the Forest Practices Code	• Assumed to meet or exceed protection accomplished by the Forest Practices Code • Inclusion of portions of Morice, Nanika, and Nadina Rivers within No Timber Harvest Areas. • Enhanced hydrological protection in the upper Morice Water Management Area • Direction regarding: o water quality and temperature, o retention of functional integrity of streams, alluvial and colluvial fans, floodplains, riparian ecosystems, and lakeshore management areas, o rehabilitation of damaged fish habitat, o restoration of fish access impeded by land use, o maintenance of populations of lake resident fish that are sensitive to overfishing, o minimizing negative effects of water withdrawals.
	Overall risk: Uncertain	Overall risk: Low-Moderate

The Morice LRMP is expected to provide a generally reduced level of risk of serious adverse impacts to many environmental values, compared to base case management.

- Regional ecosystem representation in Protected Areas and No Timber Harvest areas would be enhanced for some ecosections and biogeoclimatic zones, although some of those which are less represented in the base case (Babine Upland, Bulkley Basin and Sub Boreal Spruce) would not receive significant additional representation under the Morice LRMP.

- The risk of serious adverse impacts from industrial and recreation activities is expected to be reduced by at least one rating category for several environmental values including ecosystem representation, coarse filter biodiversity, some mountain goat populations, riparian ecosystems, rare ecosystems and aquatic ecosystems. Expected benefits to moose (low risk), grizzly bear (high risk in roaded areas), caribou (risk uncertain), marten (low to moderate risk), fisher (risk uncertain), goshawk (moderate to high risk) and bull trout (risk uncertain) are not expected to be sufficient to result in a change in risk profile for these focal species in the Morice LRMP area[100].

Environmental Risk Assessment – Morice LRMP

Ecological Objective Category	Base Case Risk Level	Morice LRMP Risk Level
Ecosystem Representation	High Risk	Moderate to High Risk
Coarse Filter Biodiversity	High in Areas developed for forestry	Moderate to High in areas developed for forestry
Focal Species		
Grizzly Bear	High in roaded areas; Low to Moderate in unroaded areas	High in roaded areas; Low to Moderate in unroaded areas*
Northern Caribou	Uncertain; depends mostly on predation	Uncertain; depends mostly on predation
Fisher	Uncertain; lack of information on local populations	Uncertain; lack of information on local populations
Northern Goshawk	Moderate to High	Moderate to High
Mountain Goat	Low for most populations; Moderate to High for small isolated populations	Low for most populations; Moderate for small isolated populations
Moose	Low	Low
Marten	Low to Moderate	Low to Moderate*
Bull Trout	Uncertain	Uncertain*
Riparian Ecosystems	Uncertain	Low to Moderate
Rare Ecosystems	High	Moderate
Aquatic Ecosystems and Fish Habitat	Uncertain	Low to Moderate

* = small improvement in risk level but not sufficient to alter rating

= significant improvement in risk level

[100] The 2004 Environmental Risk Assessment (A. Edie and Associates, 2004) noted that the Morice LRMP includes provisions intended to maintain or enhance deer winter range, but the implications of these provisions were uncertain pending implementation. LRMP objectives to provide agriculture expansion lands conflict to some degree with the deer winter range objective, although Implementation Direction in the LRMP suggests minimizing inclusion of high value wildlife habitat in expansion land parcels.

8 Integration of Socio-Economic and Environmental Assessments

The complete range of expected socio-economic and environmental impacts of the Morice LRMP are presented in this subsection, using both a graphical representation of subjective assessment results, and a more quantitative indication of the expected impacts.

A comprehensive summary of the impacts of the Morice LRMP on industry sectors, stakeholder groups and environmental values is provided in the chart on the following pages. This chart was developed by the socio-economic and environmental assessment teams, to provide a common presentation tool that displays both types of expected impacts.

Each team assigned subjective, relative, cost and benefit indicators to the impact of LRMP management initiatives on the various sectors, interests and values, based on impressions formed over the course of undertaking the separate socio-economic and environmental impact assessments. Expected impacts are indicated on the chart as Significant Costs (C), Modest Costs (c), Significant Benefits (B), Modest Benefits (b), or a mix of costs and benefits, with neither being particularly dominant (b/c). Where cells in the grid are left blank, no impacts are expected.

The rows on the chart correspond to management initiative headings in the Morice LRMP document. The columns in the chart represent the various sectors, interests and values and the cells in each column show the assessed relative impacts of the different management initiatives on the sector, interest or value represented by the column. The columns are independent from one another in the sense that a significant benefit (B) to say the recreation sector is not necessarily of the same magnitude or social significance as a significant benefit (B) to the Botanical Forest Products sector. The chart does not attempt to weigh the relative value or significance of the different sectors, interests or environmental values (columns).

Following the subjective analysis chart is a second chart giving a more quantitative perspective on base case economic parameters and the expected socio-economic and environmental impacts of the LRMP.

Table 17 Morice LRMP Subjective Socio-Economic and Environmental Assessment

General Management Direction	Management Direction	Forestry	Mining	Agriculture	Energy	Guiding/Trapping	Botanicals	Tourism	Recreation	Communities	First Nations	Ecosystem Representation: Babine Upland**	Bulkley Basin**	Bulkley Ranges**	Nechako Upland	Kimsquit Mountains	AT	CWH	ESSF	MH	SBS**	Coarse Filter Biodiversity	Focal Widlife Species: Grizzly Bear***	Caribou***	Fisher****	Northern Goshawk	Mountain Goat	Moose	American Marten	Bull Trout***	Riparian Ecosystems	Rare Ecosystems	Aquatic Ecosystems and Fish
Consultation (3.1)	sectoral interests, communities, G-2-G	b/c*	b/c	b	b/c	b	b	b	b	b	b/c																						
Community (3.2)																																	
Air Quality		c*	c					b	b	b																							
Community Resiliency										b																							
Cultural Heritage	Consultation and nondisturbance	c*	c					b	b		B																						
Hunting and Fishing	Access and activity restrictions					b			b/c		b/c																						
Recreation	Maintain facilities,features and trails functionality	c	c			b		b	B		b											b											
Settlement	Avoid sprawl but permit isolated single parcel dev'mt							b	b	b																							
Visual Resource	Establish Scenic Areas, VLIs and VQOs	C	c			b	b	b	b	b	b											b	b										
Economy (3.3)																																	
Access	Access management and consultation	c*	c	b		b		b/c	b/c		b												b	b			b			b			
Agric. and Range	Expansion of agric. land and range use	c		B				b		b/c													c		c			c					
Botanicals	Avoid damage, protect potential, minimize pesticide use	C*					B	b		b/c	B																						
Guide Outfitting	Sustain wildlife and maintain access					b		b/c	b	b																							
Minerals and Energy	Maintain access, respect other values, First Nat. protocol		b								b																						
Timber	Maintain THLB,AAC,MAI, reduce nonrecoverable	b*																															
Tourism	Maintain facilities,features and trails functionality	c	c			b		B	b		b											b											
Trapping	Maintain area,lines and access. Consultation	c*				b																											
Ecosystem (3.4)																																	
Biodiversity	RNV, old growth, patch size, WTP*, ecosystem mgmt	C				b	b	b	b		b								b		b	B	b		b				b	b	B	B	
Fish and Aquatic	Stream structure, temperature, flow, riparian, access	C*	c	c	c	b/c		b/c	b/c		b																			B	B		B
Protected Areas	Maintain hunting, trapping and tourism opportunities					b																											
Water Resources	Watershed integrity, quality, flow rates, no export	c*	c	b	c			b	b	b	b																						B
Wildlife and Habitat	Specific habitat preservation, access restriction	C*	c	c		b		b/c	b/c		b												b	b	b	b	b	b					
Other	Noxious weeds, fertilizer use, point source pollution	b/c*		b/c			b	b/c	b/c																								

Legend: c = modest costs, C = significant costs, b = modest benefits, B = significant benefits, b/c = a mix of costs and benefits.

** not modelled in MLM timber harvesting simulation; **Ecosection or Biogeoclimatic Zone has less than 10% in base case PAs or No Timber Harvest zones. *** Blue listed species; **** Red listed species.*

Table Continued

Area Specific Management	Management Direction	Forestry	Mining	Agriculture	Energy	Guiding/Trapping	Botanicals	Tourism	Recreation	Communities	First Nations	Ecosystem Representation										Coarse Filter Biodiversity	Focal Widlife Species									Riparian Ecosystems	Rare Ecosystems	Aquatic Ecosystems and Fish
												Babine Upland**	Bulkley Basin**	Bulkley Ranges**	Nechako Upland	Kimsquit Mountains	AT	CWH	ESSF	MH	SBS**		Grizzly Bear***	Caribou***	Fisher****	Northern Goshawk	Mountain Goat	Moose	American Marten	Bull Trout***			
Bulkley River	Water resource management, riparian areas	c		c			b				B																			b	b		b
Friday/Nakinilerak	Retain 30% mature and old, natural regeneration*, no range leases (Nakinilerak), fly in only to Friday Lake	c				b	b		b		b										b	b	b								b		
Gosnell/Thautil	High biodiversity emphasis, minimize road density*	C	c			b	b		b		b								b		b	b	b	b				b		b			b
Grease Trail	No harvest/HBEA buffers, non-motorized summer rec.	c				b	b	b	b		B										b	b											
Herd Dome	No timber harvest, summer non-motorized	c	c			b	b	b	B		b			B			b		b			b	b	b			b						
Matzehtzel Mtn./Nez Lake	access to avoid wetlands, summer motorized hard surf.	c*				b	b	b	b																								
Morice Ranges / Nanika L	No harvest, no new roads, no settlement	c	c			b	b	b	B		b			B		B	b	B	B	b		B	b	b		b	b		B	b			b
Morice Mountain	Motorized recreation mgmt, allow natural succession	c*					b	b	b														b				b						
Morice River	No floodplain harvest, limited harvest within buffer	c		c			b	b	B		b		b	b							B	b	b		b			b		b		B	b
Upper Morice River	No floodplain harvest, very limited harvest within buffer	C		c			b	b	b		B			b							b	b	b					b		b			
Morrison Lake/Babine E.	30m Reserve zone, 130m Riparian mgmt., 1500 HBEA	c	c			b	b	b	b		b										b	b	b					b			b		b
Nanika River	No floodplain harvest, high BDEA buffer, no water diver.	c			c		b	b	b		B											b	b						b				B
Nadina/ Owen	Very limited timber harvest	C	c			b	b	b	b		B										b	b	b			b		b	b				
Nadina River	No floodplain harvest, Limited harvest within buffer	c		c		b	b				B		b	b	b						b	b	b					B		b	b		b
Swan Lake/ China Nose	No timber harvest, motorized hard surface only	c		b/c		b	b	b	b		B		b						b		b	b	b									b	
Starr Creek	No timber harvest, manage for motorized/non-motorized	c	c			b	b	b/c	b/c		b			b			b		b			b	b				b						
Tahtsa/Troitsa	No timber harvest, manage for motorized/non-motorized	c	c			b	b	b	b		b			B		B	b	B	B	b		B	b	b			b		B				
Twinkle/Horseshoe	Non-motorized recreational use							b/c	b/c																								b
Le tal g'uz (Old Fort Mtn.)	Limit timber harvesting, maintain culturally important plant	c					b				B																						
Morice Water Mgmt. Area	Maintain hydrological integrity, water qual.and quant.	c	c								B																		b	b			b
Protected Areas																																	
Atna River	Protected					b	b	b	b		B					B		B	B			B	b	b		b	b		B	b			
Morice Lake	Protected	c	c			b	b	b	b		B			B		B	b	B	B		b	B	b	b		b	b		B	b			
Babine Lake Parks	9 very small areas along the shore of Babine Lake		c					b	b		b	b									b	b											
Tazdli Wiyez Bin (Burnie-S	Protected, non-motorized	c	c			b	b	b/c	b/c		b			B			B		B		b	B	b	b		b	b		B				b
Nadina Mountain	Protected	c	c			b	b	b/c	b/c		B				b		b		b			b	b				b					b	
Kidprice Lake Chain	Protected, Motorized use restrictions?	C	c			b	b	b	b		b			B			b	b	B		b	B	b			b	b		B	b	b		b
Old Man Lake	Protected, allow guiding, trapping, gathering	c	c				b		b		b		b								b	b									B	b

Legend: c = modest costs, C = significant costs, b = modest benefits, B = significant benefits, b/c = a mix of costs and benefits.
* not modelled in MLM timber harvesting simulation; **Ecosection or Biogeoclimatic Zone has less than 10% in base case PAs or No Timber Harvest zones. *** Blue listed species; **** Red listed species.

Table 18 SEEA Summary of Morice LRMP and Base Case

Economic Impacts	Base Case					Morice LRMP Impacts
	Direct PYs of Employment		Direct GDP ($ Million)	BC Direct Government Revenues ($ Million)	BC Net Economic Value ($ Million)	
	Morice LRMP Area	BC				
Sectoral Data:						
Forestry (AAC excl. Woodlots)	1,018	1,442	$198.08	$68.25	$45.71	• Certainty benefits • Net economic value loss equivalent to $3 million per year excluding $1 million in potential additional harvesting costs; • No jobs lost in decade 1; over 6 decades, average loss of 112 direct PYs in forest sector
Huckleberry Mine	82	215	$38.95	$1.90	$1.65	No impact
Agriculture	20	20	$0.89	$0.05	$0.06	B
Backcountry Tourism:						
Guide Outfitting	21	21	$0.64	$0.08	$0.16	B
Guided Angling	13	13	$0.94	$0.09	$0.19	B
Other Commercial Tourism	9	9	$0.38	$0.05	$0.05	B
	43	43	$1.96	$0.21	$0.41	
Other Industrial Sectors:						• Certainty benefits • Making 8.5% of Very High and High metallic mineral potential unavailable for exploration and development may translate to some loss of employment and net economic value in the long term
Mineral Exploration	• ARIS 1970-2005 expenditures: $1.9 million/yr ($2006); 4.3% of BC exploration expenditures					
Oil & Gas	• No existing activity - some potential					No impact
Hydro-electric	• Nechako reservoir system, potential run of river projects					c
Botanical Forest Products	• Limited existing activity - some potential					B
Trapping	• 62 territories; total average annual revenues of $90,000 for Morice LRMP area					B
Recreation Values	• Various estimates - some $50 range; others $10 to $20 range - estimated 100,000 recreation days				$1 million to $5 million	B
Social and Environmental Impacts	Morice LRMP Impacts					
Community Sustainability/Resilience	• Impacts of employment declines (beginning in Decade 2) from decreased forest industry activity • Benefits to ecological integrity, civic vitality, economic diversity and recreation opportunities					B/C
First Nations	• Benefits to cultural heritage, botanical forest products, culturally significant ecosystems					B
Environmental Values	• Increased ecosystem representation in Protected Areas and No Timber Harvest areas • Reduced risk to coarse filter biodiversity in area developed for forestry • Reduced risk to some mountain goat populations, riparian ecosystems, rare ecosystems and aquatic ecosystems • Less significant benefits to grizzly bear, marten, moose, and bull trout					B

Table 19 Summary of Socio-Economic Implications

	Base Case	LRMP – Final Scenario
Protected Areas	• Less than 600 hectares; or 0.04% of plan area.	• 125,000 hectares; 8.3% of landbase; • Kidprice Lake Chain: (16,000 ha) • Tazdli Wyiez Bin (Burnie Shea Lakes): (34,000 ha) • Babine Lake Marine Parks: (5,500 ha) • Atna R and Morice Lake PA (67,000 ha)
No Timber Harvest Areas	• The Base Case does not have any large No Timber Harvest areas.	• 272,000 hectares; 18.1% of landbase
Other Area Specific	• Minimal area under Base Case. • Morice LRUP Zone A protects Morice River corridor, also, other small areas to protect other values.	• 142,000 hectares; 9.5% of landbase
	• Telkwa Caribou Recovery Area establishes measures that minimize disturbances to caribou. This includes restrictions on timber harvesting activity and designated areas that are non-motorized for summer and/or winter recreational use over 74,000 hectares.	• Telkwa Caribou Recovery Area remains the same but some of the PAs and Morice LRMP Area Specific Management zones overlap the Telkwa Caribou Recovery Area.
Scenic Areas	• Scenic areas represent approximately 733,000 hectares (49% of the landbase) of which 523,500 hectares (71%) require high management consideration, and the balance or 210,000 hectares require medium or low consideration.	• Morice LRMP proposes to augment the size of Scenic Areas to 936,000 hectares (62% of the landbase), of which 670,500 hectares will require the highest level of management consideration (72%).
	• Approximately 273,000 hectares (18% of the landbase) are classified under specific Visual Quality Objectives (VQOs).	• VQOs had not yet been established for the Morice LRMP recommended scenic areas at the date of report preparation.
Forest Sector	• AAC: 1,961,117 m^3. • Billed volumes between 1996 and 2005 averaged 2.2 million m^3. • The benchmark 2002 Ministry of Forests Timber Supply Review (TSR2) base case for the Morice TSA projected that the current AAC could be maintained for 4 decades before declining by 8.1% in the fifth decade to the Long Term Harvest Level of 1.80 million m^3 (referred to hereafter as the 'falldown'). • MOFR harvest flow policy requires the current AAC to be maintained for as long as possible (to minimize short-term impacts), while limiting the harvest declines between decades to less than 10%, and maintaining the harvest level always at or above the long-term level.	• Morice Landscape Model (MLM) indicates that long term timber harvesting activity may have to drop by 7.4% to accommodate the Morice LRMP management direction and protected areas. • Applying MOFR harvest flow policy to the downward pressure on timber supply indicates that the AAC can be maintained at the current level for one decade, before beginning a series of stepdowns to a long term level in decade 6 which is 14.9% below the current level, and 7.4% below the TSR2 long term level (TSR2 anticipated an 8.1% 'falldown' from the current AAC to the long term level in the fifth decade). **Strategies to address the Mountain Pine Beetle infestation may alter the application of MOFR harvest flow policy to Morice LRMP impacts and hence the distribution of Morice LRMP impacts through time. However the assessed extent of the impacts of the LRMP on long term timber supply compared with the Base Case is unlikely to be altered.** • 1.9% of the 7.4% impact results from a 3.6% reduction in THLB and the remainder from other Morice LRMP management direction that may constrain timber harvesting activity.
	• Morice LRMP area accounts for 1.6% of the landbase of BC, but 3% of BC's THLB and 4% of provincial stumpage revenues ($59 million based on 1996 to 2005 average).	• The stepdown in stumpage revenues over five decades, which would not begin until the second decade under the MOFR harvest flow policy scenario, is equivalent to a loss of $2.8 million per annum starting immediately and continuing indefinitely (based on average rate from 2000 to 2005 of $23.23 per m^3 after

	Base Case	LRMP – Final Scenario
		accounting for inflation, adjusted downward to $22.00 in consideration of pine beetle impacts).
	• The forest sector accounts for 57% of after tax income in Houston, 56% for the Morice LRMP area (including Houston and Granisle), and 34% in Smithers/Houston (including the Morice LRMP area, Smithers and Telkwa). • The Morice AAC generates 1,018 direct PYs in the Morice LRMP area.	• An average of 112 direct forest industry jobs would be at risk over the first six decades of the harvest flow policy scenario, and 98 thereafter. Following the timber supply impact pattern, the direct job impacts would range from 0 in decade 1 to 214 in decade 4. • 78% of the direct job impacts are likely to be felt in the Smithers/Houston area and nearby communities (mainly harvesting, silviculture and wood products processing). • 22% of direct job impacts are likely to be felt in other Northern Interior communities (mainly pulp and paper processing).
	• Timber harvesting practices follow the Forest Practices Code, and its successor the Forest and Range Practices Act.	• Licensees estimate that management direction in the Morice LRMP may lead to increased harvesting costs of approximately $0.50 per m^3 in the Morice TSA, or an additional decline in government stumpage revenues of $1 million (about 2% of annual Morice TSA stumpage).
Metallic Minerals	• Huckleberry Mine (1997 to present) employs approximately 215 people and generates $39 million in annual GDP and $1.9 million in annual government revenues (half in direct corporate taxes and half in income taxes).	• The Morice LRMP will not impact Huckleberry Mine.
	• Mining and mineral exploration activities have been substantial and significant in the Morice LRMP area with 14 past producing metal mines including 4 major producers. • Some uncertainties with respect to land use and First Nations accommodation/ consultation requirements.	• The Morice LRMP will provide greater land use certainty to mineral development companies. In particular, it provides greater clarity on First Nations' requirements that mining companies will need to address, or initiates and accelerates the development of guidance on these requirements (e.g. the specification of Water management Area standards).
	• The Morice LRMP area is provincially significant for metallic minerals, accounting for 2.3% of BC's mineral tenures, 4.3% of BC's exploration expenditures and 3.7% of the High and Moderate to High metallic mineral potential in BC (compared to 1.6% of the BC landbase).	• Protected Areas (PAs) will not permit mineral exploration and development, and will overlap 8.5% of the Plan Area's Very High and High metallic mineral potential • It is difficult to assess the value of the metallic mineral potential in the PAs, but these lands represent 0.3% of the Very High and High metallic mineral potential in BC. • The PAs include 2.9% of the known metallic mineral occurrences in the Morice LRMP area, but no Developed Prospects or Prospects (as defined in the MEMPR Minfile database). Some 4,500 hectares of mineral tenures are at least partially overlapped by the Protected Areas.
Energy Sector	• There is currently no oil and gas drilling in the Morice LRMP area. 60% of the landbase has no oil and gas potential, 31% has poor oil and gas potential, and only 9% is rated as having moderate or high oil and gas potential.	• The Protected Areas include none of the oil and gas potential that is rated high and only 1% of the oil and gas potential that is rated as moderate.
	• The Morice LRMP area includes an important portion of the Nechako reservoir created as part of the Kemano project.	• The Morice LRMP should not have an impact on the operations of the Nechako Reservoir.
Agriculture	• The agriculture and food manufacturing sector (including fish hatcheries and fish processing) account for 2% of basic after-tax income in the Morice LRMP area generating an estimated 100 direct, indirect and induced jobs. Cattle ranching dominates the farming sector, involving over 130 people and generating 20 direct PYs, annual sales of $4 million, range fees of $36,000 and annual wages and salaries of $0.5 million. • The Morice LRMP area accounts for 1.8% of all Crown rangeland forage production (AUMs) in BC.	• There are no range tenures, agricultural leases or Agriculture Land Reserve lands in the Protected Areas. • The Morice LRMP benefits the cattle ranching sector by targeting 20,500 hectares of additional Crown land to be allocated to agriculture activities, provided that agriculture is determined to be the most appropriate commercial use of the land. • Morice Landscape Model sensitivity analysis of agriculture expansion impacts on timber supply indicates that the maximum agriculture lands expansion permitted by the LRMP would have significant impacts on timber supply (up to 1% reduction in long term timber supply). As noted above, the LRMP provides that all the

	Base Case	LRMP – Final Scenario
		• proposed agricultural expansions will need to pass a "most appropriate commercial use" test so the expansion may be less than the maximum and the timber supply impacts correspondingly less.
Trapping	• The Morice LRMP area generates annual revenues of approximately $87,000 (based on average reported harvest for the Morice LRMP area).	• The Morice LRMP will benefit the trapping sector mainly through any benefits to wildlife and wildlife habitat. Access management provisions may also benefit some trapping territories.
Botanical Forest Products	• The botanical forest products sector is not regulated and provides no direct public sector rent in the form of royalties or other direct revenues to the Crown. • The Office of the Wet'suwet'en is developing a berries management plan, which aims to re-establish and enhance huckleberry production to provide for traditional use and commercial sales.	• The Morice LRMP recognizes the importance of botanical forest products to all local residents for personal use and consumption, and makes provisions to maintain or enhance the production of botanical forest products. • While the Morice LRMP may benefit the development of botanical forest products, thereby providing significant heritage, cultural and personal value, the economic impacts are likely to be minimal to the local communities and to the province.
Backcountry Tourism	• The Morice LRMP area accounts for 2.1% of BC's guided hunting days, 3.2% of BC's guided hunting clients and 4.7% of guided angling days in BC, compared to the Morice region's 1.6% of the total BC landbase. • Guide-outfitting, guided angling and other commercial backcountry tourism generate an estimated 43 direct PYs in the Morice LRMP, industry revenues of $4.7 million, direct GDP of $2.0 million, and direct government revenues of $0.2 million.	• The Morice LRMP is expected to have a positive impact on backcountry tourism through General Management Direction (GMD) that is aimed at maintaining tourism and recreation values such as facilities, features and trails functionality, as well as scenic areas. • More specific benefits through Protected Areas (PAs), Area Specific Management (ASM), and access management are summarised below.
Guide Outfitting	• There are 9 guide-outfitters with territories that overlap the Morice LRMP boundaries with three of these having a base or satellite camp in the area. • Guide-outfitting activities in the Morice LRMP area generate an estimated 21 direct PYs. • The growth potential for guide-outfitting is limited by preferred wildlife species populations, and future revenue growth may come more from increasing the value of the experience. There is growth potential in the non-hunting product.	• The Morice LRMP will have a positive impact on existing guide-outfitting operations. • Wildlife habitat management and biodiversity conservation measures should help to maintain wildlife populations. • Guide-outfitters will have continued motorized access to support guiding operations in PAs. • If guide-outfitting operations grow through the non-hunting product portion of their business, access provisions that do not conform to the area specific restrictions on recreation activities may become an issue.
Guided Angling	• There are 19 guides operating on the major rivers and lakes in the Morice Area, and an additional 7 angling guides that operate over the length of the Bulkley River (based on 1998/1999 data). • Guided angling in the Morice LRMP area provides 13 PYs of direct employment.	• The Morice LRMP establishes Area Specific Management (ASM) zones and protected areas (PAs) along all the rivers and lakes in the Morice LRMP that are Classified Waters, and where guided angling takes place, except for Babine Lake where the Morice LRMP established various marine parks. • The Morice LRMP provides direction for the development of a Lakeshore Management Strategy. • Improved management of riparian ecosystems and aquatic habitat, as well as the designation of the Morice Water Management Area, should help maintain fish populations,.
Other Backcountry Adventure Tourism	• In addition to guide-outfitting and guided angling, there are another 5 or 6 commercial tourism operations that offer backcountry multi-day tours in the Morice LRMP area (backcountry skiing, snowmobiling tours, canoeing/kayaking, hiking, trail riding, etc.). • These generate 9 PYs of direct employment.	• The Morice LRMP will benefit backcountry adventure backcountry tourism operators in addition to outfitter and angling guides. • The proposed PAs and No Timber Harvest areas include 89% of the High Tourism Opportunity areas, and 41% of tourism features • All tourism facilities will benefit from the GMD guidelines for Scenic Areas. • Additional restrictions on motorized recreation uses will likely benefit the adventure backcountry tourism sector.

	Base Case	LRMP – Final Scenario
Tourism Potential	• Identified opportunities for backcountry tourism development include the development of cultural/historical winter adventure tours, a hut system, lake tours, destination lodges and freshwater-non-motorized canoeing and rafting activities.	• The Morice LRMP proposes various PAs, No Timber Harvesting areas and ASM zones that will allow areas that are particularly suitable for tourism activities to develop in the future. How much of this potential will be realized will depend on markets and other factors.
Recreation	• Morice LRMP area provides a wide range of backcountry activities including steelhead and freshwater angling on the world renowned Bulkley and Morice Rivers; boating and/or swimming on Babine Lake, the Nanika-Kidprice chain of lakes, and many others; resident hunting; as well as hiking, horseback riding, snowmobiling and backcountry skiing. • In the provincial context, the region accounts for 1.1% of BC's freshwater angling days but 4.8% of steelhead angling days, and for 2.1% of BC's resident hunter days. • The Morice LRMP area sponsors an estimated 100,000 days a year of backcountry recreation (excluding visits to local lakes for boating, swimming and other front country activities). • The Granisle and Houston Community Recreation Forests both provide trails for horseback riding, mountain biking walking, hiking and cross country skiing.	The Morice LRMP will have a positive impact on recreation: • GMD should help protect wildlife habitat and wildlife populations; • All Classified Waters are in PAs or Area Specific Management zones; • Of the 25 MOFR recreation sites, 11 will be in PAs or in area specific management zones. • The Kidprice Lake Chain and trails will be included in a protected area. • The Morice LRMP provides management direction to maintain the functional integrity of features (200 metres), facilities (500 metres) and trails (200 metres each side). • The Grease Trail between Fort Babine and Talkla Lake will be further protected with a 100 metre No Timber Harvest buffer on either side of the trail, and a 70% mature forest retention direction between 100 metres and 500 metres on either side of the trail. • Snowmobiling (some 12,000 visitor days per year) will not be significantly impacted by motorized recreation restrictions as popular areas such as the Telkwa range, the Dungate area, the Sibola range and the Topley Granisle trail network will remain mainly open to motorized activities in winter. Some areas in the Telkwa Mountains will be non-motorized throughout the year, but most of those areas were already designated non-motorized under the Telkwa Caribou Recovery Plan.
	Access Management • The Telkwa Caribou Recovery Area Base Case restricts motorized recreational activities on 52,461 hectares in the summer (3.5% of landbase) and 44,547 hectares in winter (3.0% of landbase). • In particular, the Telkwa Caribou area designated the polygons 9B (Starr Creek) as non-motorized (all season), 9D as non-motorized restricted public access, and 9C as non-motorized in the summer. • There are also motorized restrictions in the Houston Community Recreation Forest.	• The access management plan for motorized and non-motorized recreation activities will benefit backcountry recreation users by allowing a mix of experiences to be provided. • Under the Morice LRMP, 6.1% of the landbase will be non-motorized in all seasons (22% of this will be in PAs, 29% in No Timber Harvest and other ASM zones and 49% in GMD). • An additional 0.6% will be non-motorized in winter only. • An additional 12.5% will be non-motorized in summer and a further 6% will have motorized activities restricted to hard surfaces during summer, bringing to 24.6% the area where motorized activities will be restricted.
Communities and Settlements	• Approximately 5,200 people reside in the Morice LRMP area: Houston (3,600 residents), Granisle (350 residents), Topley, Topley Landing, Tatchet and rural population (remaining 1,250 people). • Other nearby communities that depend on the Morice LRMP area resources include Smithers, Telkwa and Burns Lake, having a combined population of 8,727 people. • The Morice LRMP area derives 56% of its income from the forest sector (57% for Houston alone), 7% from mining, 2% from tourism, and 2% from agriculture and food. The public sector, which partly depends on the	• Community capacity building, local empowerment, resource inventory information and stakeholder consensus are key benefits of the LRMP to plan area communities. • Under the harvest flow policy scenario for timber supply over the next 6 decades, there would be no employment loss in Houston/Granisle in Decade 1. Employment levels would then be lower than under the Base Case by 45 direct, indirect and induced PYs of employment in Decade 2, 89 PYs in Decade 3, 110 PYs in Decade 4, and 50 PYs thereafter.

	Base Case	LRMP – Final Scenario
	population base and local economy, accounts for 12% of income, and other sectors, transfer payments and pensions account for the balance of 21%. • The two sawmills in Houston process 1.5 times more wood than is harvested from the Morice LRMP area (the Canfor sawmill is the world's largest softwood sawmill and Houston Forest Products (West Fraser/Weldwood) is the sixth largest sawmill in BC.). By-products from those mills are utilized by other mills in Houston and other Northern Interior communities. • Under the Base Case, employment from the Morice LRMP would be maintained for 5 decades and then fall by 8.1% assuming a proportional change from the expected 'falldown'.	• The corresponding negative impact on population levels for Houston/Granisle ranges between 0 in Decade 1 and 208 people in Decade 4, for an average of 109 people throughout the 6 decades (2% of current population). • This assumes that the loss of wood processing employment would be felt in other nearby communities rather than in Houston. Impacts would be greater if the loss of wood processing jobs associated with reduced timber supply occurs in Houston (up to 7% of the Houston/Granisle labour force). • The Morice LRMP will benefit the local tourism sector, but a doubling in existing backcountry tourism activities would be required by Decade 2 to offset the minimum loss of 45 PYs in Houston/Granisle that could result from the decline in timber supply. By Decade 3, the backcountry tourism sector would have to be approximately 3 times greater than what it is today to offset the decline in forest sector employment projected for that decade. • Impacts on community resilience are mixed, with benefits such as greater ecological integrity, greater economic diversity, greater local governance and maintaining recreation values, counterbalancing the socio-economic costs associated with the jobs at risk.
First Nations	• First Nations with an interest in the Morice LRMP area include the Office of the Wet'suwet'en, the Lake Babine Nation (including the Nedo'ats Hereditary Chiefs), the Wet'suwet'en First Nation (Carrier Sekani Tribal Council), the Cheslatta Carrier First Nation and the Yekooche First Nation. • The Bulkley Nechako Regional District includes approximately 41,000 people of which approximately 6,000 are of First Nations ancestry. • First Nations with an interest in the Morice LRMP area are increasingly active in the forest industry and are pursuing eco-cultural tourism opportunities. First Nations have a vital economic and cultural interest in salmon populations and fish habitat in the Morice LRMP area, in wildlife populations supporting hunting and trapping activities, as well as in botanical forest products and culturally significant ecosystems. • First Nations concerns which may be addressed by the Morice LRMP include: • The rate of road development and timber harvesting • Degradation or destruction of cultural heritage sites • Degradation of culturally significant ecosystems/ botanicals • Degradation of fish and wildlife habitat • Water quality	• First Nations values, interests and aspirations should be better accommodated by the Morice LRMP than by base case management. Additional clarity provided by the Morice LRMP on permitted land uses and consultation expectations, may provide increased opportunities to First Nations for partnership and revenue sharing agreements. • Cultural Heritage GMD reinforces the base case conservation of archaeological sites and cultural heritage resources. Other GMD that will benefit First Nations pertains to botanical forest products, consultation, recreation and ecosystems. • The objectives for the proposed PAs to maintain and protect cultural heritage values, recognize hunting and angling as acceptable use, and encourage economic opportunities for small commercial backcountry tourism ventures, are consistent with First Nations values and concerns. • Many of the ASM zones provide specific management direction for First Nations cultural heritage values, while others are managed for high biodiversity, seral stage and access restrictions, which are also consistent with First Nations values and concerns. • There are 22 Wet'suwet'en house territories that are substantially within the Morice LRMP area. The Morice LRMP PAs and ASM zones provide a high degree of protection (additional to GMD) for cultural heritage values in 7 of these house territories, and a moderate degree of protection in another 5. Moreover, each Wet'suwet'en clan has at least one house territory that has a high degree of additional protection of cultural heritage values.

	Base Case	LRMP – Final Scenario
		• Morice Water Management area – which includes water quality monitoring to collect base line data and then water planning in the upper Morice watershed, which is an area of cultural significance for the Wet'suwet'en.
Provincial Government Revenues	• On average (1997 to 2002), the Morice AAC has generated $89.1 million in annual direct provincial government revenues including stumpage ($64 million), other forest industry taxes ($14.7 million) and employee personal income taxes ($10.5 million). • Huckleberry Mine generates approximately $2 million in direct government revenues. • Direct government revenues from backcountry tourism add to $0.4 million and agriculture to $0.06 million.	• The stepdown in stumpage revenues over five decades, which would not begin until the second decade under the MOFR harvest flow policy scenario, is equivalent to a loss of $2.8million per annum starting immediately and continuing indefinitely. • Licensees estimate that the Morice LRMP may lead to increased harvesting costs, which may further reduce stumpage revenues by $1 million per year (about 2% of Morice TSA stumpage revenues).
Provincial Net Economic Value	• The Net Economic Value (also called net Resource Value or Economic Rent) estimates the net benefits gained from resource extraction and consumer surplus gained from the use and existence of a certain good, service or resource, over an above the production costs for obtaining the resource. • The commercial sectors in the Morice LRMP area generate $47.8 million in Net Economic Value, of which $45.7 million is stumpage revenues and labour rents from the forest sector. • The consumer surplus associated with recreation values in the Morice LRMP area is estimated to range between $1 million and $5 million for 100,000 recreation days.	• The stepdown in net economic value from the forest industry over five decades, which would not begin until the second decade under the MOFR harvest flow policy scenario, is equivalent to a loss of $3 million per annum starting immediately and continuing indefinitely. • Licensees estimate that management direction in the Morice LRMP may lead to increased harvesting costs of about $0.50 per m^3, or an additional decline in annual net economic value of some $1 million. • Net economic value accounting for the forest industry is incomplete, as it should be offset by any decline in the negative externalities caused by base case harvesting rates and practices. • At the provincial level, to offset the decline in forest industry activity would require the equivalent of 2 new mines the size of Huckleberry Mine. Alternatively, the Morice LRMP area backcountry tourism sector would be required to grow by approximately 7 or 8 times. • A four-fold increase in backcountry recreation days could also potentially offset the drop in net economic value from forestry (based on the consumer surplus averaging $10 per recreation day).

9 Conclusions

The Morice LRMP provides a long term vision for the strategic direction of land and resource management on 1.5 million hectares of Crown land in northwest BC. This plan provides the framework for a locally developed social contract for users and/or developers of the lands and resources in the Morice plan area.

9.1 Net Economic Value Implications

From a Net Economic Value perspective, the costs related to changes in forest industry activity (equivalent to $3 million per annum[101] excluding a potential $1 million in additional harvesting costs) and mining industry activities are balanced against benefits associated with maintaining or expanding recreation value, backcountry tourism, botanical forest products, agriculture and trapping. The sectors and activities that are expected to experience net economic benefits (with the exception of recreation) are currently very small in terms of their contribution to the flow of net economic value from the Morice LRMP area. Benefits to these sectors are likely to occur over a long time horizon, and are unlikely to offset the costs incurred from changes in forest industry activity, which are expected to begin one decade from now.

The Net Economic Value accounting is incomplete, however, as it does not include externalities arising from forestry and mining sector activities. Concerns expressed by planning table representatives, as well as the base case environmental risk assessment for the Morice LRMP, indicate that there are negative externalities associated with the base case rates and methods of timber harvesting, and potential mining activities. The extent to which these negative externalities will be reduced by Morice LRMP management direction should be set against the raw Net Economic Value cost implications presented in Table 18. While we have been unable to quantify either the base case level of these externalities, or the extent of their potential amelioration through LRMP initiatives, there is some expression of this amelioration in Table 19 in the benefits noted to other sectors and interests, as well as environmental values.

9.2 Economic Development Implications

The Morice LRMP may result in a loss of direct forest industry employment and to a lesser extent, potential mining industry employment over the long term, relative to the base case projections. These losses may be offset to some degree, over time, by employment gains in other sectors. As with the net economic value accounting, however, the sectors which should see some LRMP related gain in employment are currently small in terms of the overall employment levels that rely on Morice LRMP area resources. It is unlikely that the gains from these sectors will completely offset the losses in the forestry and mining sectors.

Some of the potential job losses, and offsetting job gains, will likely occur in the Morice LRMP communities. The large and efficient lumber manufacturing operations in Houston may be able to mitigate declines in timber supply from the Morice LRMP area by attracting a larger proportion of their timber requirements from outside the plan area. Nevertheless, the loss of jobs associated with the harvesting side of the forest sector will likely lead to an overall net loss of employment in Houston and Granisle. Expected modest employment gains in other sectors will assist these communities in their goal to add greater diversity to their economic base.

[101] Calculated as the annuity equivalent of the net present value of reduced stumpage and labour rents.

The Morice LRMP generally facilitates First Nations economic development strategies in the forest sector, eco-cultural tourism, botanical forest products and backcountry adventure tourism.

9.3 Social Implications

Community capacity building, local empowerment, resource inventory information and stakeholder consensus are key benefits of the planning process to plan area communities. The impacts on community resilience are mixed, with benefits such as greater ecological integrity, greater economic diversity, greater local governance and maintenance of recreation values, counterbalancing the socio-economic costs associated with the jobs at risk.

First Nations should benefit through the protection of cultural heritage resources, as well as any incremental benefits to fish and wildlife populations, and culturally significant ecosystems.

9.4 Environmental Implications

The Morice LRMP is expected to provide a generally reduced level of risk of serious adverse impacts to many environmental values, compared to base case management.

Regional ecosystem representation in Protected Areas and No Timber Harvest areas will be enhanced for some ecosections and biogeoclimatic zones, although some of those which are less represented in the base case (Babine Upland, Bulkley Basin and Sub Boreal Spruce) will not receive significant additional representation under the Morice LRMP.

The risk of serious adverse impacts from industrial and recreation activities is expected to be reduced by at least one rating category for several environmental values including coarse filter biodiversity, some mountain goat populations, riparian ecosystems, rare ecosystems and aquatic ecosystems. Expected benefits to moose (low risk), grizzly bear (high risk in roaded areas), caribou (risk uncertain), marten (low to moderate risk), fisher (risk uncertain), goshawk (moderate to high risk) and bull trout (risk uncertain) are not expected to be sufficient to result in a change in risk profile for these focal species in the Morice LRMP area.

Appendices

APPENDIX A THLB AND TIMBER SUPPLY VOLUME IMPACTS OF THE MORICE LRMP COMPARED TO THE TABLE RECOMMENDED PLAN

Subsequent to the Table Recommended Plan of March 2004, Government-to-Government (G2G) discussions were held with First Nations to address issues not amenable to resolution through the planning table process.

The only changes in the final Morice LRMP relative to the Table Recommended Plan that are likely to have an impact on THLB and timber supply volume are as follows:

- Reducing the extent of the agricultural expansion areas suggested in the Table Recommended Plan.
- Two additional protected areas (PA), the Atna River PA (approx. 18,919 hectares including 973 hectares in the Atna Ecological Reserve which were designated protected under the Table Recommended Plan) and the Morice Lake PA (45,644 hectares) surrounding Morice Lake. These new PAs are substantially contained within an area called Morice Lake in the Table Recommended Plan, designated as a no-timber-harvest area.

Timber supply modelling exercises[102] indicate that reducing the extent of the agriculture expansion lands (not permitting expansion to the "Morice West" lands which include about 2,000 hectares of THLB) has a slightly positive impact (+0.2%) on longer term potential timber supply. This impact is considered to be insignificant for the purposes of this analysis:

- there was considerable uncertainty over the likelihood that these agricultural expansion lands would be taken up as modelled in the analysis of the Table Recommended Plan; and
- this 0.2% positive impact is beneath the measurement precision of the timber supply model (the model is thought to be accurate to the nearest 1%[103]).

Reductions in the THLB (incremental to the reductions proposed in the Table Recommended Plan) associated with the creation of the Morice Lake protected area would be similarly small (about 2,000 ha. or 0.3% of total THLB[104]). When these small THLB reductions are combined with the reduced uptake of agriculture expansion lands in the timber supply model, the net result is a very slight reduction (ranging from 0.2% to 0.8% in different decades) in mid-term timber supply (years 30 – 50), and a small increase of about 0.1% in the long-term timber supply.

Adjustments to the boundaries of the Morice Lake proposed protected area subsequent to the February 2006 timber supply model results would have a very small positive influence on timber supply. This positive influence was estimated at 0.04% of long term timber supply levels[105]. Given that the timber supply model is thought to be accurate to the nearest 1%, this impact is deemed negligible, and is not carried forward through the timber supply impact analysis.

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[102] Gowlland Technologies (Andrew Fall), *G2G Analysis*, prepared for the Morice LRMP: Government Technical Team, February 20, 2006.

[103] *Socio-Economic and Environmental Assessment: Morice LRMP Table Final Land Use Recommendations*, page 5

[104] Gowlland Technologies (February 20, 2006) estimated that the Morice Lake proposed protected area would remove 2,262 hectares from the THLB. Subsequent boundary adjustments reduced this amount by 305 hectares (ILMB GIS data), to 1,957 hectares.

[105] Burger, Hubert, BC MAL - ILMB, *Estimate of Timber Supply Impacts of Phase 2 of G2G Negotiations for the Morice LRMP Draft for Discussion*, July 12, 2006.

APPENDIX B REVISED STUMPAGE RATES FOR ASSESSING FOREST IMPACTS

The following table shows stumpage rates for the Morice TSA from 1997 through 2002 as reported in the SEEA report for the *Morice LRMP Table Final Land Use Recommendation*.

Table 20 Stumpage Rates for Morice Timber Supply Area, 1997-2002

	1997	1998	1999	2000	2001	2002	6 Year Average - 1997 to 2002
Average Rates:							
BC Timber Sales	$53.92	$43.46	$27.11	$35.89	$26.79	$21.66	
All Others	$40.45	$37.19	$30.12	$32.31	$22.01	$21.10	
Weighted Average	$41.18	$37.62	$29.94	$32.71	$22.38	$21.14	
Volume (000 m^3)							000 m^3
BC Timber Sales	114	150	146	252	185	174	170
All Others	1,978	2,037	2,257	2,017	2,212	2,054	2,093
Total Volume	2,092	2,187	2,403	2,269	2,397	2,228	2,263
Constant 2002 $							Constant $
BC Timber Sales	$59.63	$47.62	$29.20	$37.63	$27.39	$21.66	
All Others	$44.74	$40.75	$32.44	$33.88	$22.50	$21.10	
Weighted Average	$45.55	$41.22	$32.24	$34.29	$22.88	$21.14	$32.61
CPI (2002$)	90.4	91.3	92.9	95.4	97.8	100	
CPI (1992$)	107.6	108.6	110.5	113.5	116.4	119	

Source: BC Ministry of Forests, Revenue Branch, *Summary of Volumes and Average Stumpage Rates*, various years, www.for.gov.bc.ca (February 2004); as reported in *Morice LRMP SEEA: Morice LRMP Table Final Land use Recommendation*, page 81. The report can be accessed at: http://srmwww.gov.bc.ca/ske/lrmp/morice/docs/Morice_SEEA-Final_Table_Recommendation.pdf.

The following table calculates a 6 year average for stumpage rates based on updated stumpage rates for 2000 through 2005 using the same methodology as was used in the 2004 SEEA of the Morice LRMP Final Land use Recommendation, but using more recent data.

Table 21 Stumpage Rates for Morice Timber Supply Area, 2000-2005

	2000	2001	2002	2003	2004	2005	6 Year Average
Average Rates	$30.90	$22.30	$20.31	$14.76	$18.67	$23.32	$27.11
Volume (000 m^3)	2,283	2,181	2,238	2,308	1,764	1,981	2,126
Constant 2005$	$34.67	$24.40	$21.73	$15.37	$19.08	$23.32	$23.23
CPI (2005$)	89.1	91.4	93.4	96.0	97.8	100.00	
CPI (1992$)	113.5	116.4	119	122.3	124.6	127.3	
Average Total million 2005$	$79.13	$53.20	$48.65	$35.46	$33.66	$46.20	$49.38

Notes:

1. Data for 2000, 2001 and 2002 are from: BC Ministry of Forests, Revenue Branch, *Summary of Volumes and Average Stumpage Rates*, various years, www.for.gov.bc.ca (February 2004); as reported in *Morice LRMP SEEA: Morice LRMP Table Final Land use Recommendation*, page 81.
2. Data for 2003 through 2005 are based on reported volumes by billing date from the Ministry of Forests Harvest Billing System (provided by Glenn Farenholtz of ILM Bureau (BCMAL), November, 2006).
3. The averages within a given year and for the 6-year average represent total revenues divided by total volume. The 6-year weighted average of $23.23 is slightly higher than the arithmetic 6-year average of $23.09.

APPENDIX C AREA STATISTICS FOR MORICE LRMP

The Ministry of Agriculture and Lands (MAL) provided Geographic Information System (GIS) data to *Pierce Lefebvre Consulting* who then tabulated the results. Referred to as Area Statistics throughout the report, the GIS data overlay various resource values and activities (e.g. Timber Harvesting Land Base, mineral potential, tourism uses, etc.) with the boundaries of the areas subject to specific resource management direction (e.g. Protected Areas, No Timber Harvesting zones, etc.).

The tables following provide a summary of the Area Statistics provided in August 2006 by MAL for the purpose of this socio-economic assessment.

Table 22 Summary Area Statistics for the Morice LRMP

Morice LRMP Resource Management Zones Final G2G	Total Plan Area		Private Land		Parks and Proteced Areas		Mining/Tourism Permitted - No Forest Harvesting		All Resource Uses Permitted - Specific Values Identified		All Resource Uses Permitted (GMD)	
	GRAND TOTAL	THLB	THLB	Total	THLB	Total	THLB	Total	THLB	Total	THLB	Total
ANALYSIS INDICATORS												
Hectares	1,501,663	693,762	829	33,435	17,926	125,055	7,243	271,610	82,219	141,732	585,545	929,831
Forests												
Community Forest (ha)												
Granisle	4,054	3,137	16	106	12	88	0	0	3,104	3,855	5	5
Houston	3,511	2,538	0	51	0	0	0	0	2,538	3,460	0	0
Woodlots (ha)	18,981	11	0	1,518	0	0	0	0	0	645	11	16,818
Scenic Areas - TSR_VAL (ha)												
High	523,459	189,792	523	24,838	13,093	61,516	4,040	99,343	26,715	51,050	145,421	286,712
Medium	165,252	75,041	22	1,830	302	1,314	131	45,098	9,145	16,253	65,440	100,757
Low	44,589	30,143	77	1,269	0	0	0	0	0	0	30,066	43,319
Scenic Areas - LRMP_VAL (ha)												
1	662,563	215,461	497	26,340	16,160	110,962	4,993	137,440	39,745	80,280	154,065	307,541
2	247,225	114,919	157	3,507	574	2,724	1,093	67,344	8,703	14,493	104,392	159,158
3	33,410	20,626	82	1,665	0	0	0	0	1,557	3,986	18,988	27,760
Visual Quality Objectives (ha)												
Modification	37,980	26,185	18	298	14	57	120	566	1,445	3,380	24,588	33,679
Preservation	36,401	4,539	0	2	2,549	20,705	18	9,162	1,060	3,899	912	2,634
Partial Retention	141,002	78,395	160	7,407	665	1,526	225	11,743	8,923	17,612	68,422	102,714
Retention	58,066	18,769	32	1,002	2,316	6,175	376	22,519	3,491	6,800	12,553	21,571
Agriculture												
ALR (ha)	39,367	895	32	16,099	0	154	0	0	83	5,029	780	18,085
Agriculture Leases (ha)	4,564	2,276	36	559	0	0	0	0	171	337	2,069	3,668
Range Tenures (ha)												
Animal Unit Months												
Arability Expansion Potential (ha)												
High	52,440	27,347	7	246	33	244	378	529	2,665	7,701	24,264	43,719
Medium	36,089	16,815	8	56	61	332	251	482	3,104	6,287	13,392	28,933
Low	1,413,135	649,600	814	33,133	17,832	124,479	6,614	270,600	76,451	127,744	547,889	857,180
Minerals												
Metallic Mineral Ranking (ha)												
Very High 1	586,134	243,802	72	6,997	14,266	68,458	5,535	151,883	41,503	72,407	182,427	286,389
Very High 2	329,333	140,114	396	13,328	2,578	47,626	951	56,484	9,778	23,131	126,410	188,765
High 3	210,858	132,386	0	5	0	0	0	0	8,857	13,010	123,529	197,843
High 4	295,423	148,232	198	2,406	769	5,063	0	53,435	18,494	25,738	128,772	208,780
Moderate 5	36,304	14,196	134	4,806	1	2	757	1,436	131	866	13,174	29,193
Moderate6	31,098	14,665	30	5,892	0	0	0	0	3,456	6,580	11,179	18,625
Low 7	12,516	367	0	0	312	3,905	0	8,373	0	0	54	238
Mineral Tenures (ha)	195,399	75,659	54	3,430	61	3,404	598	54,766	8,016	15,178	66,930	118,620
ARIS												
Assessment Report Sites	925	448	0	26	0	14	1	134	48	74	399	677
Expenditures ($1986)	43,527,089	17,684,677	0	1,359,951	0	482,920	14,444	7,307,556	1,078,124	1,539,237	16,592,109	32,837,425
Metallic Mineral Occurrences												
Developed Prospect	14	5	0	1	0	0	0	4	1	1	4	8
Past Producer	14	2	0	1	0	0	0	2	0	1	2	10
Producer	1	0	0	0	0	0	0	0	0	0	0	1
Prospect	25	9	0	0	0	0	1	7	1	2	7	16
Showing	189	65	0	2	1	7	0	45	6	18	58	117

Morice LRMP Resource Management Zones Final G2G	Total Plan Area		Private Land		Parks and Proteced Areas		Mining/Tourism Permitted - No Forest Harvesting		All Resource Uses Permitted - Specific Values Identified		All Resource Uses Permitted (GMD)	
	GRAND TOTAL	THLB	THLB	Total	THLB	Total	THLB	Total	THLB	Total	THLB	Total
Tourism and Recreation												
Existing Tourism Facilities	52	8	0	13	1	3	0	8	1	6	6	22
Existing Tourism Features	230	46	0	9	3	29	0	19	6	49	37	124
Kilometres of Trail	1,048	197	0	67	13	60	2	103	90	320	92	499
Tourism Opportunity (ha)												
High	55,876	7,332	5	227	1,218	17,437	470	18,530	4,224	13,769	1,416	5,913
Medium	106,070	8,326	15	403	706	20,112	277	46,146	1,811	4,423	5,518	34,985
Low	351,935	83,053	129	10,237	4,661	36,774	361	98,499	18,230	39,612	59,672	166,813
Recreation Opportunity Spectrum (ha)												
Roaded Modified	694,539	500,576	731	11,344	3,140	4,875	1,402	11,203	50,419	71,299	444,885	595,818
Unclassified	15,532	2,265	0	1,204	664	2,990	76	5,376	622	3,030	903	2,931
Roaded Natural	50,065	10,257	13	340	616	12,167	64	3,749	2,459	9,359	7,106	24,451
Primitive	189,077	4,679	0	0	2,843	61,313	655	125,404	1,192	1,805	-11	555
Rural	22,653	741	62	15,900	0	0	0	0	37	1,305	642	5,448
Semi Primitive Motorized	159,712	55,025	19	395	2,778	12,488	514	38,974	8,128	21,186	43,587	86,669
Motorized	291,096	119,273	0	42	7,678	26,938	4,533	75,342	19,346	31,539	87,716	157,236
Urban	5,976	24	4	4,099	0	1	0	0	15	404	5	1,473
Wildlife												
Grizzly Bear Management Zones (ha)												
Managed	0	0	0	0	0	0	0	0	0	0	0	0
Unmanaged	0	0	0	0	0	0	0	0	0	0	0	0
Caribou Habitat Management Are	490,824	177,582	63	2,707	1,455	12,484	1,106	164,365	22,709	33,047	152,249	278,221
Telkwa Key Forested Habitats (ha	73,919	20,671	0	0	775	8,880	431	8,167	4,661	7,194	14,804	49,679
Takla Proposed Ungulate Winter F	4,044	1,212	0	0	0	0	0	0	0	0	1,212	4,044
Tweedsmuir Calving Islands (ha)	1,322	347	0	0	0	0	0	0	0	0	347	1,322
Deer Winter Range (ha)	0	0	0	0	0	0	0	0	0	0	0	0
Mountain Goat Core Habitat (ha)												
Potential	12,369	1,064	0	77	36	828	0	7,265	224	619	804	3,581
Occupied	87,687	2,402	0	8	352	19,751	84	52,671	358	1,785	1,607	13,472

*NOTES -
THLB (Timber Harvesting Land Base) including all Partial and Contributing Area
Source: BC Ministry of Agriculture and Lands, August 2006; based on data from various data bases from the Ministry of Forests, Ministry of Energy and Mines, and the BC Ministry of Agriculture and Lands.

Morice LRMP Resource Management Zones Final G2G	Total Plan Area		Private Land		Parks and Proteced Areas		Mining/Tourism Permitted - No Forest Harvesting		All Resource Uses Permitted - Specific Values Identified		All Resource Uses Permitted (GMD)	
	GRAND TOTAL	THLB	THLB	Total	THLB	Total	THLB	Total	THLB	Total	THLB	Total
ANALYSIS INDICATORS												
Hectares	1,501,663	693,762	0.1%	2.2%	2.6%	8.3%	1.0%	18.1%	11.9%	9.4%	84.4%	61.9%
Forests												
Community Forest (ha)												
Granisle	4,054	3,137	0.5%	2.6%	0.4%	2.2%	0.0%	0.0%	98.9%	95.1%	0.2%	0.1%
Houston	3,511	2,538	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	100.0%	98.5%	0.0%	0.0%
Woodlots (ha)	18,981	11	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.2%	3.4%	99.8%	88.6%
Scenic Areas - TSR_VAL (ha)												
High	523,459	189,792	0.3%	4.7%	6.9%	11.8%	2.1%	19.0%	14.1%	9.8%	76.6%	54.8%
Medium	165,252	75,041	0.0%	1.1%	0.4%	0.8%	0.2%	27.3%	12.2%	9.8%	87.2%	61.0%
Low	44,589	30,143	0.3%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	99.7%	97.2%
Scenic Areas - LRMP_VAL (ha)												
1	662,563	215,461	0.2%	4.0%	7.5%	16.7%	2.3%	20.7%	18.4%	12.1%	71.5%	46.4%
2	247,225	114,919	0.1%	1.4%	0.5%	1.1%	1.0%	27.2%	7.6%	5.9%	90.8%	64.4%
3	33,410	20,626	0.4%	5.0%	0.0%	0.0%	0.0%	0.0%	7.5%	11.9%	92.1%	83.1%
Visual Quality Objectives (ha)												
Modification	37,980	26,185	0.1%	0.8%	0.1%	0.2%	0.5%	1.5%	5.5%	8.9%	93.9%	88.7%
Preservation	36,401	4,539	0.0%	0.0%	56.2%	56.9%	0.4%	25.2%	23.4%	10.7%	20.1%	7.2%
Partial Retention	141,002	78,395	0.2%	5.3%	0.8%	1.1%	0.3%	8.3%	11.4%	12.5%	87.3%	72.8%
Retention	58,066	18,769	0.2%	1.7%	12.3%	10.6%	2.0%	38.8%	18.6%	11.7%	66.9%	37.1%
Agriculture												
ALR (ha)	39,367	895	3.5%	40.9%	0.0%	0.4%	0.0%	0.0%	9.3%	12.8%	87.1%	45.9%
Agriculture Leases (ha)	4,564	2,276	1.6%	12.3%	0.0%	0.0%	0.0%	0.0%	7.5%	7.4%	90.9%	80.4%
Range Tenures (ha)	0	0										
Animal Unit Months	0	0										
Arability Expansion Potential (ha)												
High	52,440	27,347	0.0%	0.5%	0.1%	0.5%	1.4%	1.0%	9.7%	14.7%	88.7%	83.4%
Medium	36,089	16,815	0.0%	0.2%	0.4%	0.9%	1.5%	1.3%	18.5%	17.4%	79.6%	80.2%
Low	1,413,135	649,600	0.1%	2.3%	2.7%	8.8%	1.0%	19.1%	11.8%	9.0%	84.3%	60.7%
Minerals												
Metallic Mineral Ranking (ha)												
Very High 1	586,134	243,802	0.0%	1.2%	5.9%	11.7%	2.3%	25.9%	17.0%	12.4%	74.8%	48.9%
Very High 2	329,333	140,114	0.3%	4.0%	1.8%	14.5%	0.7%	17.2%	7.0%	7.0%	90.2%	57.3%
High 3	210,858	132,386	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	6.2%	93.3%	93.8%
High 4	295,423	148,232	0.1%	0.8%	0.5%	1.7%	0.0%	18.1%	12.5%	8.7%	86.9%	70.7%
Moderate 5	36,304	14,196	0.9%	13.2%	0.0%	0.0%	5.3%	4.0%	0.9%	2.4%	92.8%	80.4%
Moderate6	31,098	14,665	0.2%	18.9%	0.0%	0.0%	0.0%	0.0%	23.6%	21.2%	76.2%	59.9%
Low 7	12,516	367	0.0%	0.0%	85.2%	31.2%	0.0%	66.9%	0.0%	0.0%	14.8%	1.9%
Mineral Tenures (ha)	195,399	75,659	0.1%	1.8%	0.1%	1.7%	0.8%	28.0%	10.6%	7.8%	88.5%	60.7%
ARIS												
Assessment Report Sites	925	448	0.0%	2.8%	0.0%	1.5%	0.2%	14.5%	10.7%	8.0%	89.1%	73.2%
Expenditures ($1986)	43,527,089	17,684,677	0.0%	3.1%	0.0%	1.1%	0.1%	16.8%	6.1%	3.5%	93.8%	75.4%
Metallic Mineral Occurrences												
Developed Prospect	14	5	0.0%	7.1%	0.0%	0.0%	0.0%	28.6%	20.0%	7.1%	80.0%	57.1%
Past Producer	14	2	0.0%	7.1%	0.0%	0.0%	0.0%	14.3%	0.0%	7.1%	100.0%	71.4%
Producer	1	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Prospect	25	9	0.0%	0.0%	0.0%	0.0%	11.1%	28.0%	11.1%	8.0%	77.8%	64.0%
Showing	189	65	0.0%	1.1%	1.5%	3.7%	0.0%	23.8%	9.2%	9.5%	89.2%	61.9%

Morice LRMP Resource Management Zones Final G2G	Total Plan Area		Private Land		Parks and Proteced Areas		Mining/Tourism Permitted - No Forest Harvesting		All Resource Uses Permitted - Specific Values Identified		All Resource Uses Permitted (GMD)	
	GRAND TOTAL	THLB	THLB	Total	THLB	Total	THLB	Total	THLB	Total	THLB	Total
Tourism and Recreation												
Existing Tourism Facilities	52	8	0.0%	25.0%	12.5%	5.8%	0.0%	15.4%	12.5%	11.5%	75.0%	42.3%
Existing Tourism Features	230	46	0.0%	3.9%	6.5%	12.6%	0.0%	8.3%	13.0%	21.3%	80.4%	53.9%
Kilometres of Trail	1,048	197	0.1%	6.4%	6.8%	5.7%	0.9%	9.8%	45.6%	30.5%	46.7%	47.6%
Tourism Opportunity (ha)												
High	55,876	7,332	0.1%	0.4%	16.6%	31.2%	6.4%	33.2%	57.6%	24.6%	19.3%	10.6%
Medium	106,070	8,326	0.2%	0.4%	8.5%	19.0%	3.3%	43.5%	21.7%	4.2%	66.3%	33.0%
Low	351,935	83,053	0.2%	2.9%	5.6%	10.4%	0.4%	28.0%	21.9%	11.3%	71.8%	47.4%
Recreation Opportunity Spectrum (ha)												
Roaded Modified	694,539	500,576	0.1%	1.6%	0.6%	0.7%	0.3%	1.6%	10.1%	10.3%	88.9%	85.8%
Unclassified	15,532	2,265	0.0%	7.8%	29.3%	19.3%	3.4%	34.6%	27.5%	19.5%	39.8%	18.9%
Roaded Natural	50,065	10,257	0.1%	0.7%	6.0%	24.3%	0.6%	7.5%	24.0%	18.7%	69.3%	48.8%
Primitive	189,077	4,679	0.0%	0.0%	60.8%	32.4%	14.0%	66.3%	25.5%	1.0%	-0.2%	0.3%
Rural	22,653	741	8.3%	70.2%	0.0%	0.0%	0.0%	0.0%	5.0%	5.8%	86.6%	24.0%
Semi Primitive Motorized	159,712	55,025	0.0%	0.2%	5.0%	7.8%	0.9%	24.4%	14.8%	13.3%	79.2%	54.3%
Motorized	291,096	119,273	0.0%	0.0%	6.4%	9.3%	3.8%	25.9%	16.2%	10.8%	73.5%	54.0%
Urban	5,976	24	15.1%	68.6%	0.0%	0.0%	0.0%	0.0%	64.5%	6.8%	20.4%	24.7%
Wildlife					0.0%	0.0%	0.0%	0.0%				
Grizzly Bear Management Zones (ha)												
Managed	0	0										
Unmanaged	0	0										
Caribou Habitat Management Area	490,824	177,582	0.0%	0.6%	0.8%	2.5%	0.6%	33.5%	12.8%	6.7%	85.7%	56.7%
Telkwa Key Forested Habitats (ha	73,919	20,671	0.0%	0.0%	3.7%	12.0%	2.1%	11.0%	22.5%	9.7%	71.6%	67.2%
Takla Proposed Ungulate Winter I	4,044	1,212	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Tweedsmuir Calving Islands (ha)	1,322	347	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Deer Winter Range (ha)	0	0										
Mountain Goat Core Habitat (ha)												
Potential	12,369	1,064	0.0%	0.6%	3.4%	6.7%	0.0%	58.7%	21.0%	5.0%	75.6%	28.9%
Occupied	87,687	2,402	0.0%	0.0%	14.6%	22.5%	3.5%	60.1%	14.9%	2.0%	66.9%	15.4%

APPENDIX D ADDITIONAL REFERENCES TO ENVIRONMENTAL ASSESSMENT

The summarized information presented on environmental effects in this document was prepared by A. Edie and Associates, and is based on the detailed Environmental Risk Assessment undertaken in 2004[106]. Since the 2004 Environmental Risk Assessment (ERA), G2G negotiations have resulted in changes between the table recommended and final Morice LRMP. A. Edie and Associates has considered these changes during the preparation of summarized information presented here. This Appendix explains how the 2004 Risk assessment was interpreted in light of changes arising from the G2G agreement.

The key changes resulting from the G2G agreement that impact the ERA are as follows:

- New protected areas around Morice Lake and in the Atna drainage,
- Deletion of the protected area around Nanika Lake,
- Establishment of a water management area over a portion of the upper Morice watershed, and
- Establishment of special management in the vicinity of the community of Old Fort near Babine Lake.

It is important to note that the changes in protection status in the Morice, Atna, and Nanika areas have very small implications for the environmental risk assessment undertaken in 2004. This is because the changes in protection occur almost entirely on land designated as No Timber Harvesting under both the 2004 plan and the final Morice LRMP. Under the G2G agreement, the total amount of land included in protected or No Timber Harvesting status increased by approximately 3800 hectares, all in the vicinity of the outlet of Morice Lake. While this area is certainly important for its exceptional environmental values, and will benefit locally from protected status, the 3800 hectares involved is less than 0.3% of the LRMP area. Since forest harvest, and forestry related access, were the primary drivers in the risk assessment in 2004, the general accuracy of that assessment will not be affected by the G2G agreement.

The exact nature of management changes required by the Water Management Area and the Le Talh Giz (Old Fort Mountain) Area Specific Resource Management Zone are not clear. However, it seems reasonable to assume that both will, if anything, lower environmental risk slightly from levels anticipated in the 2004 assessment.

The remainder of this Appendix will discuss specific environmental values considered in preparation of the summarized information presented in this document.

Ecosystem Representation

Ecosystem representation data presented here incorporate adjustments in boundaries resulting from the G2G agreement. New GIS area analyses were provided by William Elliot of Geoborealis Spatial Data Management of Smithers, BC. Changes to percent representation are generally small, and result both from the G2G agreement as well as from small apparent changes in the boundaries of Ecosections and Biogeoclimatic Zones made independent of the LRMP process since 2004.

Coarse Filter Biodiversity

[106] Edie A. and Associates, *Environmental Risk Assessment: Morice LRMP Table Final Land Use Recommendation*, June 2004.

The only significant change here is that risks to Coarse Filter Biodiversity are, under the G2G agreement, lower in the newly protected 3800 ha. in the vicinity of Morice Lake. Elsewhere, risks should remain as assessed in 2004. Within the No Timber Harvesting areas, the G2G agreement will shift potential mineral exploration and mining activities from the now protected Atna and Morice areas to the formerly protected Nanika area but the impacts of this change for coarse filter biodiversity are not predictable because the nature and extent of mineral exploration or mining is uncertain. In any case, as discussed in Edie (2004), impacts to Coarse Filter Biodiversity within No Timber Harvesting areas should be small due to the infrequency of mine development and the limited geographic extent of exploration and development activity.

Specific Wildlife Species and Ecosystems

The 2004 assessments of risk for caribou, grizzly bear, marten, and goshawk were driven by computer simulation models which tracked the influence of forest harvest and/or forest access development on habitat availability and quality. Since the amount of land subject to forest harvest has not changed significantly under the G2G agreement, general risk assessment for these species is not changed.

Risk for fisher was assessed subjectively in 2004 due to lack of data to support alternate analyses. The only change presented to this assessment by the G2G agreement is that the newly protected land in the vicinity of the outlet of Morice Lake might be relatively important habitat for fisher, so local benefits may accrue there for this species. This change would not affect the overall evaluation of risks to fisher, which were considered uncertain due to lack of data.

Risk for mountain goats was assessed partly subjectively and partly by simulation modeling in 2004. Subjective assessment considered several management recommendations regarding access restrictions, protection of thermal habitat, and avoidance of disease transfer by domestic animals. None of these matters are changed as a result of the G2G agreement. Simulation modeling undertaken in 2004 predicted the future proximity of road access to known goat populations, and drew conclusions about potential poaching risk presented by increasing access. Since the roads considered in the simulation were only forest development roads, the G2G agreement has no significant impact on the 2004 assessment.

Risk for moose was evaluated subjectively in 2004. Significant influence of the LRMP on moose was considered to result only from forestry activities, so the G2G agreement does not affect assessment of risk for moose.

Risk to bull trout, riparian ecosystems, and aquatic ecosystems and fish were evaluated subjectively in 2004. While the G2G agreement does not change the overall evaluation of risk for any of these three environmental values, the Water Management Area in the upper Morice Watershed has the potential to provide local benefits. If the changes in management caused by Water Management Area status result in better protection of stream and riparian habitats, particularly of small streams sometimes favored by bull trout, the G2G agreement could provide benefits to all of these values within the management area.

Rare ecosystems were also assessed subjectively in 2004. The G2G agreement does not change the general assessment due to the small change in the amount of land available to forest harvest, and the probable lack of rare ecosystems in the area in which forest operations are newly excluded.

APPENDIX E SELECTED REFERENCES

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