



CARIBOO-CHILCOTIN

BEETLE ACTION COALITION

October 2007

CCBAC Interim EDWG Sector Strategies

CCBAC is very pleased to make the Economic Development Working Group interim sector strategies available for use by the sector participants and stakeholders, the CCBAC working groups, the various ministries within the provincial and federal governments, and most importantly the citizens of the Cariboo-Chilcotin.

CCBAC is compelled to make this information available as quickly as is possible in order to meet its objective of developing and growing the overall economic activity within the Cariboo-Chilcotin.

CCBAC will identify each completed sector strategy as an 'interim' document through the use of this cover letter. To CCBAC this means that the interim strategy is a 'stand alone' document at the time of its release, and that the interim sector strategy has not been 'integrated' with other interim sector strategies in any manner or form. The use of the information contained within the interim sector strategy is the responsibility of the user. CCBAC does not endorse or support any specific use or proposal that uses the interim sector strategy material.

CCBAC supports all interim sector strategies in principle only at this time.

CCBAC intends to begin the sector strategy integration process immediately. At the conclusion of the integration process CCBAC intends to have completed a community diversification plan for the entire CCBAC area. The interim sector strategies will be an integral part of this plan.

For additional information on the attached interim sector strategy, please contact the members of the sector strategy advisory committee, members of the CCBAC EDWG, or Keith Dufresne CCBAC Manager.

On the behalf of the CCBAC Board

Keith Dufresne, CCBAC Manager

Phone: 1-250-392-9747 | Email: manager@c-cbac.com

Box 4883, Station Main | Williams Lake, B.C. V2G 2V8





CARIBOO-CHILCOTIN

BEETLE ACTION COALITION

Cariboo Chilcotin “Forest Sector Strategy” Sector Strategy Strategy Process Overview October 2007

This is a brief overview of the development of the Forest Sector Strategy from its commencement in May/2006 to its acceptance as an completed “interim strategy” in September 2007.

This strategy generally followed the generic outline developed by the Economic Development Working Group (EDWG). From this outline, a more detailed workplan was drafted to help guide the process, timeline and budget.

The following additional steps were taken:

1. Various forest sector representatives were invited to an open meeting in early Spring/2006 in an effort to explain the purpose and goals of CCBAC and to solicit input into the development of a Forest Sector Strategy. As a result of this early meeting a Forest Sector Strategy Steering Committee was formed. The steering committee includes representation from each of the various “sub-sectors” who hold rights to harvest Crown timber (see the Strategy document for a complete list of members).
2. The steering committee used a “request for proposals/interview process” to select a contractor (May/2006) to develop a sector strategy under steering committee guidance and direction.
3. The contractor (M.A. Carlson RPF) met periodically with individual sub-sectors and at key junctures with the steering committee for advice and direction. Information/data was collected from a wide range of sources. The Cariboo Licensee Land Use Strategy Committee was engaged by CCBAC to provide short and mid-term timber supply modeling to support strategy development.
4. A draft strategy was presented to the CCBAC board in March/2007.

CARIBOO CHILCOTIN **BEETLE**



ACTION
COALITION

Phone: 1-250-392-9747

Email: manager@c-cbac.com

Cariboo-Chilcotin Beetle Action Coalition

FOREST SECTOR STRATEGY

Prepared for:

Cariboo-Chilcotin Beetle Action Coalition

November 25th, 2007

Acknowledgements

This strategy was developed with input and guidance from a Forest Sector Strategy Steering Committee whose members include:

Member	Affiliation
Bedford, Dave	West Chilcotin Forest Products
Brahniuk, Ken	Central Cariboo Forest District
Brigden, Eric	Cariboo Small Scale Harvesters Association
Conly, Dave.....	Tolko Industries Ltd.
Day, Steve	Cariboo Licensee Land Use Strategy Committee
Dickie, Jim.....	Cariboo Small Scale Harvesters Association
Dodge, Steve	Quesnel Forest District
Donahue, Sean.....	B. C. Timber Sales
Dufresne, Keith	CCBAC
Flinton, Bob.....	Note taker
Gardner, Larry	Cariboo Licensee Land Use Strategy Committee
Holm, Lennart	Cariboo Licensee Land Use Strategy Committee
Hood, Robin	Community Forest License Holders
Lake, Ryan.....	Tolko Industries Ltd.
Linde, Forrest	Linde Brothers Sawmill
Massier, John.....	Quesnel Woodlot Association
Raatz, Ray	100 Mile Forest District
Schmid, Ernie	Cariboo Licensee Land Use Strategy Committee
Schwarz, Dave.....	Non Sawlog Sector
Stolar, Harold	Chilcotin Forest District
Teppema, Leonard.....	Cariboo Small Scale Harvesters Association
Turner, Andy	Sigurdson Bros Sawmill – NRFL
Weckerle, Guenter.....	Cariboo Licensee Land Use Strategy Committee
Young, Bill	
Carlson, Mike	Forest Sector Strategy Contractor

PREFACE

In preparing this report, the Forest Sector Strategy Steering Committee has attempted to adhere to the guidance provided by CCBAC in the document titled “Generic Outline for Cariboo Chilcotin Beetle Action Coalition Regional Sector Strategies”. The strategy report documents the existing state of the forest industry and describes critical challenges and issues faced by the industry as a result of the beetle epidemic. It explores both short and long term opportunities created by the infestation. However, the report is unsuccessful in providing a precise vision of what our future forest estate will look like in the post beetle era or what the future state of the industry might be. It acknowledges and recognizes the many variables and information gaps as well as factors beyond our control, that hinder our ability to map the future. The document does however, make recommendations to resolve outstanding issues that, once resolved will allow development of a more precise strategy aimed at addressing the needs of both industry and communities.

The report recognizes that the forest sector strategy is just one component of the overall economic diversification plan envisioned by CCBAC and that the integration of the various sector strategies is intended to provide the “blueprint” for the future of the region. In this regard, the timeline for completion of this report has to some degree been dictated by CCBAC’s needs for an integrated product and as a result this report has in many cases not been able to consider or take advantage of the results of ongoing or planned studies/works. The issues and challenges documented in the report represent a snapshot in time and were those facing the sector as the report was being written (fall 2006/winter 2007). The report recognizes that as issues are resolved new issues will appear and at least to some degree success depends on our ability to respond to these changes. Factors, which are unpredictable or beyond our control (such as markets and the value of the Canadian dollar), may have the most significant impact on the sector’s future and must be “managed” accordingly.

The strategy is operational in focus and has a community/region perspective. The report recognizes that work may be underway in other parts of the province which may have direct relevance to the challenges and issues faced locally. In particular, it must be noted, that the existing “Provincial Mountain Pine Beetle Action Plan” is attempting to address many of the issues set forth in this document from an overall provincial perspective and studies/projects are already underway. Much of this work will have direct relevance to the Cariboo and the challenge will be to transfer the results and knowledge gained from that process to create solutions at the local level. The Action Plan is working to improve forest and non-forest inventory information and to gain a better understanding of the economic shelf life of damaged stands. Work is underway to better assess the beetle impacts on a full range of resources including biodiversity, watersheds and community fire protection. A project titled the “Future Forest Strategy Initiative” has been undertaken as a pilot in the Kamloops area. A “Forests For Tomorrow” program has been initiated aimed at developing the most efficient ways to rehabilitate damaged areas. The ongoing “Future Forest Ecosystem Initiative” project is sponsoring relevant research and modeling work. It is anticipated that these actions will make considerable progress in addressing our issues

and needs; however, the timeliness of this work will continue to be a major issue. Efforts and work developing this CCBAC Forest Sector Strategy make the Cariboo an ideal location to pilot and test some of these provincial initiatives.

TABLE OF CONTENTS

<u>1.</u>	<u>FOREST SECTOR PROFILE</u>	1
<u>1.1</u>	<u>SECTOR DEFINITION AND DESCRIPTION</u>	1
<u>1.2</u>	<u>SUB-SECTORS</u>	5
<u>1.3</u>	<u>NON-SAWLOG OPERATIONS</u>	10
<u>1.4</u>	<u>HARVEST LEVELS</u>	11
<u>1.5</u>	<u>STUMPAGE</u>	18
<u>1.6</u>	<u>GROSS PRODUCT VALUE</u>	19
<u>1.7</u>	<u>EMPLOYMENT</u>	20
<u>1.8</u>	<u>OPPORTUNITIES AND CHALLENGES</u>	22
<u>2.0</u>	<u>HISTORICAL SECTOR DEVELOPMENT</u>	25
<u>3.0</u>	<u>GROWTH OPPORTUNITY AND TRENDS</u>	27
<u>3.1</u>	<u>EXISTING PRODUCTS, EXISTING MARKETS</u>	27
<u>3.2</u>	<u>NEW PRODUCTS, NEW MARKETS, NEW USES FOR EXISTING PRODUCTS</u>	28
<u>4.0</u>	<u>LAND AND RESOURCE MANAGEMENT ISSUES</u>	28
<u>5.0</u>	<u>SECTOR ACTION PLAN</u>	29
<u>5.1</u>	<u>FORESTS AND FIBER</u>	29
<u>5.2</u>	<u>PRICING/MONETARY ISSUES</u>	33
<u>5.3</u>	<u>PRODUCTS AND MARKETING</u>	36
<u>5.4</u>	<u>LOGGING AND MILLING</u>	39
<u>5.5</u>	<u>SAFETY</u>	39
<u>5.6</u>	<u>COMMUNICATION</u>	39
<u>5.7</u>	<u>LAND AND RESOURCE MANAGEMENT ISSUES</u>	40
<u>6.0</u>	<u>LOOKING TO THE FUTURE</u>	42
<u>7.0</u>	<u>FOREST SECTOR STRATEGY ACTION PLAN SUMMARY</u>	44

1. FOREST SECTOR PROFILE

1.1 SECTOR DEFINITION AND DESCRIPTION

Generally, the term “forest sector” describes the collection of industries involved in the consumptive, commercial utilization of the forest resource. The sector includes all activities directly associated with forest harvesting, manufacturing, marketing, and post harvest activities associated with long term forest management.

This report is primarily focused on the portion of the industry which consumes raw material in log form as opposed to that portion of the industry which inputs a semi-manufactured product and increases its value through further stages of manufacture (commonly called value-added). Although part of the overall forest sector, separate strategies are being developed for the secondary wood products group and the Cariboo-Chilcotin log home builders. Pulp mills have been included under the broad strategy as their raw material is a necessary by-product of the sawmill industry.

The forest sector in the Cariboo is almost exclusively dependent on a supply of raw material (logs) from public land. The public forests of the province have been divided into various management units including timber supply areas (TSAs), tree farm licences (TFLs), woodlot licences (WLs) and community forests. Each management unit has a specified rate of harvest termed the allowable annual cut (AAC). The AAC may be further categorized into smaller pieces called partitions to suit specific management objectives. In the case of the Williams Lake TSA, the AAC has been further divided on a geographical basis to deal with the management complexities of the far western portion of the TSA. The AAC for TSAs is “apportioned” by the Minister of Forest and Range into various tenure types.

The current forest sector in the Cariboo includes an unorganized collection of sub-sectors largely dependent on the large, integrated sawmills. For the purpose of this report these sub-sectors are generally defined by the type of harvesting licence granted to them by the Crown. Sub-sectors include: holders of major licences within a TSA (these licences are generally long-term and replaceable), holders of TFLs, holders of relatively small replaceable licences in a TSA, holders of woodlot tenures, holders of relatively large non-replaceable licences within a TSA, holders of community forest tenures, holders of small-scale salvage licences within a TSA, or the British Columbia Timber Sales (BCTS) program. The BCTS program awards competitive timber sale licences to third parties in both TSAs and TFLs.

Tables 1-3 show the AAC and apportionment for each of the TSAs in the Cariboo Region. Once a woodlot or community forest agreement has been issued it becomes a separate management unit and is not part of the TSA allowable annual cut. Any reference to woodlots or community forests in Tables 1 – 3 denotes volume apportioned for future tenures.

1.2 SUB-SECTORS

Major License Holders

The forest sector in the Cariboo is dominated by the major licensees. Major licensees by definition are those licensees who hold a major tenure. Major tenures are defined by legislation and are generally those licences which are long term and replaceable (often termed quota licences). Non-replaceable forest licences are also major tenures. Although there are a few relatively small major licence holders, for the most part, this sector is composed of the large, integrated forest companies with large milling complexes.

Prior to the mountain pine beetle (MPB) outbreak, the majority of harvesting rights were in the form of major tenures. Significant AAC increases have occurred throughout the region to address the need for an accelerated harvest to combat the beetle and recover valuable wood before its commercial value is lost or devalued due to drying, checking and eventual decay. This incremental AAC has been apportioned to a variety of tenure types including timber sales, non-replaceable forest licences and the British Columbia Timber Sales program. Many of these incremental licences (particularly non-replaceable forest licences) are held by major licensees.

Corporate consolidation in the past few years has resulted in a significant reduction in the number of major licensees and a rationalization of their manufacturing facilities. Following is a list of major manufacturing facilities excluding secondary manufacturers: (additional facilities exist which operate on an intermittent basis or manufacture specialty products)

Table 4

Timber Supply Area	Licensee	Type of Facility
100 Mile House	West Fraser Timber	2 sawmills
	Ainsworth Lumber Co. Ltd.	1 oriented strand board plant
Williams Lake	Tolko Industries Ltd.	3 sawmills
	West Fraser Timber	1 sawmill 1 plywood plant
	West Chilcotin Forest Product	1 sawmill
	Linde Bros. Lumber Ltd.	1 sawmill**
	Chimney Creek Lumber Co. Ltd.	1 sawmill**
	Sigurdson Bros. Logging Co. Ltd.	2 sawmills
	S & P Forest Products	1 sawmill**
Quesnel	Tolko Industries Ltd.	1 sawmill
	Canfor	1 sawmill
	West Fraser Timber	2 sawmills 1 mdf plant* 1 plywood plant 1 BCTMP pulpmill*** 1 NBSK pulpmill***
	C & C Wood Products	1 sawmill**
	M & K Sawmills Ltd.	1 sawmill**

- * *This list does not include those facilities that are covered in the Cariboo-Chilcotin Log Home Builders Strategy or the Secondary Wood Manufacturers Strategy. West Fraser's medium density fiberboard plant is listed because it is integral to their overall manufacturing complex but it is more properly dealt with under the Secondary Manufacturers Strategy.*
- ** *Note: there is a wide range in size between various facilities. Those noted ** are relatively small and/or cater to a specific market niche.*
- *** *Abbreviation differentiates pulp based on the manufacturing process. BCTMP denotes Bleached Chemi-Thermo-Mechanical pulp. NBSK denotes Northern Bleached Softwood Kraft pulp.*

In addition to the harvest from timber supply areas there are other area based tenures with independent AACs. West Fraser Timber Co. Ltd. holds two Tree Farm Licences (TFLs) in the Quesnel area (amalgamation into one in progress). These are “area based” tenures where the prime licence holder bears both short and long term management responsibility over a specific tract of land. (There is provision for secondary tenures administered by BC Timber Sales to be awarded on a restricted basis).

Table 5 shows the present AAC commitment for TFLs in the region.

Table 5

TFL No.	Licensee	AAC Date	Licence m³	BCTS m³	Total m³
05	West Fraser	2003-01-01	258,061	41,939	300,000
52	West Fraser	2003-01-01	494,761	75,239	570,000
TFL Total			752,822	117,178	870,000

Community Forest Agreements

Community Forests are another example of area based tenure. Although the concept of community based forestry has been around for some time it wasn't until the late 1990's that the government decided to pilot this type of tenure and just recently has made announcements to expand the program.

There are two community forests; one in the Likely area and the other near Alkali Lake. Their AACs are shown in Table 6.

Table 6

Community Forest Agreement Holder	Area (ha)	Licence AAC m³
Esketemc First Nation		20,000
Likely-Xats'ull		14,000
Community Forest Total		34,000 *

* AAC increased significantly over this number to deal with mountain pine beetle
 Note: The community of 100 Mile House has been offered a CFA with an AAC of 20,000 m³.

The vision of the BC Community Forest Association is to create “a network of community forest initiatives, where local people practice ecologically responsible forest management in perpetuity, fostering and supporting healthy and vibrant rural communities and economies”. One of their prime purposes is to “promote community forest management as a strategy for community economic development” and to make the community responsible for local land use while creating local forest-based employment.

Woodlot Licences

In addition, there are a number of woodlots (another area based tenure) in the region. Most WLs are held by local residents or organizations with strong ties to local communities. (This is a function of the WL award process which factored in proximity of residence to the WL area and private land contribution). Of the 149 WLs in the Cariboo-Chilcotin, six (6) are held by First Nations bands and four (4) by societies (clubs) or communities. The remaining WLs are held by a broad spectrum of entrepreneurs including forest consultants, contractors, forest industry employees as well as a large number of ranchers/farmers.

A recent survey of woodlot tenure holders suggests that the vast majority of licences are impacted to some degree by the MPB. The survey trend suggests that more than half of all tenure holders are severely impacted (i.e. greater than 50% of the mature volume killed). In addition, a significant number of woodlot tenures are being impacted by Douglas-fir and/or spruce beetles.

Table 7 shows the number, area and distribution of WLs across the region.

Table 7

District	Number of WLs	Schedule A * (m ³ AAC)	Schedule B ** (m ³ AAC)	Total (m ³ AAC)	Schedule A (HA)	Schedule B (HA)	Total (HA)
Central Cariboo	47	6,079	48,367	54,446	9,205.6	27,869.0	37,074.6
Chilcotin	5	239	2,378	2,617	851.1	2,959.5	3,810.6
100 Mile House	32	2,722	56,213	58,935	2,651.2	18,780.0	21,431.2
Quesnel	65	8,501	83,337	91,838	6,586.3	38,347.6	44,933.9
Totals	149	17,541	190,295	207,836	19,294.2	87,956.1	107,250.3
Averages	n/a	117.7	1277.1	1394.8	129.5	590.3	719.8

* Schedule A refers to Crown Granted (private) land

** Schedule B refers to Crown (public) land

Small Scale Salvage

A further sub-sector is represented by the group of independent operators who hold a special form of small, non-replaceable harvesting tenure and whose operations are restricted to small, isolated patches of salvage timber. Current legislation restricts the size of individual sales to less than 2000 m³ and individual forest district salvage policy may further restrict/guide operations to achieve specific salvage objectives. Generally, the small, scattered patches of timber targeted under this program are of lesser interest to the major licensees or BCTS. Applications do not require that the applicant be registered in the BC Timber Sales program; however, applications must be signed by a registered professional certifying the accuracy and quality of the data and prescription.

This sub-sector does not have a defined apportionment of the AAC; however, each individual district has a target volume to be delivered under the program. (Note: This is changing and it is likely that the apportionment for AAC uplifts in both the 100 Mile House and Williams Lake TSAs will include an apportionment for small scale salvage). Generally, the demand exceeds the ministry's ability to deliver. The target volume is determined on the basis of a variety of factors including: availability of suitable salvage opportunities, demand for the program, and the overall salvage strategy for the management unit or district, possible incremental silvicultural liabilities accrued to the Crown, and the limited staff and dollar resources of the Crown to deliver and administer the program. Volumes harvested under this sub-sector fluctuate significantly from year to year and targeted volumes for 2006 were generally less than that sold in 2005. Fluctuations are largely driven by demand which, in turn, is ultimately a function of the market price for logs and the ability of the Ministry of Forests and Range to deliver the program.

Table 8 shows the 2006 program target for each of the four districts in the Region:

Table 8

Forest District	Approximate No. of Participants	Target Volume m³
Central Cariboo	40-50	70,000 ¹
Chilcotin	4 - 5	7,500 ²
Quesnel	5 - 10	28,000 ³
100 Mile House	30 - 40	50,000 ⁴

¹ originally 30,000 m³ was committed to one applicant. It now appears that party has not signed the license making the entire 70,000 m³ available for professional applications.

² the small scale salvage priority for this district is Douglas-fir so applications are restricted accordingly.

³ suitable opportunities (as defined by the Ministry) for small scale salvage are limited in view of the overall state of attack.

⁴ district is participating in a pilot program for "intermediate salvage". Under this program a number of Forestry Licence to Cut tenures will be offered competitively ranging in size from 2000-5000 m³.

BC Timber Sales

The British Columbia Timber Sales program is recognized as a distinct sub-sector under the broad forest sector strategy. “BC Timber Sales is an autonomous organization within the Ministry of Forests and Range, with financial and operational independence from regional and district operations.” (quoted from BCTS Service Plan 2006/07-2008/09). The program has been apportioned a defined segment of the AAC for each of the TSAs and TFLs. The provincial BCTS program is broken down geographically and is administered by 12 separate BC Timber Sales business areas. The Quesnel, Chilcotin, and Central Cariboo Forest Districts all form part of the Cariboo-Chilcotin Business Area. The 100 Mile House Forest District is part of the Kamloops Business Area.

The mandate of the program is to market a targeted volume each business year through a variety of competitive, non-replaceable licence opportunities. The organization does this by planning, developing and selling (by sealed tender public auction) an assigned portion of the AAC. BCTS is similar to other major licensees and has similar pre and post harvesting obligations and the same obligation to comply with statutes and regulations. A key objective of this program is to provide a credible reference point for costs and pricing of all Crown timber sold throughout the province. (This, so called market based pricing, has been a key element of government’s strategy to deal with Canada-U.S. softwood lumber negotiations). Other program objectives include optimizing net forest revenue and providing an opportunity for access to raw material for existing and new operators.

At the present time there are approximately 70 active registrants participating in the bidding process for TSLs.

Table 9 shows the apportionment for the BCTS program within the Cariboo.

Table 9

100 Mile House TSA	322,871 m ³
Williams Lake TSA	569,720 m ³
Quesnel TSA	978,998 m ³
TFL 5	41,939 m ³
TFL 52	75,239 m ³

Table 10 shows the published Timber Sales Schedule for each of the TSAs for the past four fiscal years (April 1 to March 31). (Source: BCTS web site)

Table 10

Fiscal Year	TSA	Area (ha)	Volume m³
2003/04	Quesnel		581,167
	Williams Lake		516,447
	100 Mile House		160,423
	Total		1,258,037
2004/05	Quesnel		552,559
	Williams Lake		695,844
	100 Mile House		368,130
	Total		1,616,533
2005/06	Quesnel		663,576
	Williams Lake		582,541
	100 Mile House		329,203
	Total		1,575,320
2006/07	Quesnel		845,292
	Williams Lake		637,300
	100 Mile House		277,860
	Total		1,760,452

Note: The above figures show scheduled volumes only. Volumes actually sold and volumes actually harvested during this same period may differ slightly. e.g. the actual volume sold 2005/06 was 1,957,581 m³ and the actual volume harvested during this period was 1,994,155 m³.

1.3 NON-SAWLOG OPERATIONS

In addition to the sawmilling industry, there are at least three additional categories of primary wood manufacturers. Two of these consume raw logs, the other, consumes a by-product of the sawmilling industry.

The first is the Oriented Strand Board plant which is located in 100 Mile House and owned by Ainsworth Lumber Company Ltd. This plant consumes approximately 650,000 cubic meters per year and produces approximately 425 MMsf* of OSB panels on a 3/8 inch basis. The plant draws its wood supply from a large geographic area extending from Kamloops to Chetwynd and beyond. The plant is capable of consuming a multi species mix of logs and currently uses approximately 50% dead pine and the remaining 50% is composed of deciduous (35% aspen and 5% birch) and a mix of Douglas-fir, spruce and balsam. Approximately 75% of production is marketed in North America as sheathing or specialty products.

The second is the production of veneer and plywood. West Fraser Timber Co. Ltd. operates two plywood plants in the region; one in Williams Lake, the other in Quesnel. The Williams Lake plant consumes approximately 450,000 m³ of raw logs composed primarily of pine, spruce and Douglas-fir. Log specifications vary but typically logs must be greater than 8-9 inches at the small end with a maximum log size of 34 inches. Pine has traditionally contributed a significant percentage of the overall peeler stock but the percentage is declining due to quality issues such as checking.

Production at the Quesnel plant is estimated at 222 MMsf 3/8 inch basis* and 248 MMsf 3/8 inch basis* at the Williams Lake operation. In excess of 80% of total production is sold in Canada. (Source: West Fraser Timber Co. Ltd. Annual Report 2005)

* Note: MMsf 3/8 inch basis refers to a measurement of production being a million square feet of plywood at a thickness of 3/8 inch.

The third is the pulp and paper sector. There are two pulp mills in the region, both in Quesnel, one owned solely by West Fraser Timber Co. Ltd. (Quesnel River Pulp), the other jointly owned by West Fraser and Daishowa-Marubeni International Ltd (Cariboo Pulp & Paper Company).

Quesnel River Pulp produces approximately 320,000 tonnes per year of softwood and hardwood Bleached Chemi-Thermo-Mechanical Pulp and Thermo Mechanical pulp combined. This pulp is used for printing and writing papers, specialty papers, folding boxboard, higher quality mechanical printing papers and tissue and towel products. (Source: West Fraser Timber Co. Ltd. Annual Report 2005).

Cariboo Pulp produces approximately 336,000 tonnes per year of Northern Bleached Softwood Kraft pulp. NBSK is used by paper manufacturers to produce a variety of paper products, including printing and writing papers, and tissue products.

The primary source of fiber for both pulp mills is by-product chips from West Fraser sawmill operations. Daishowa-Marubeni markets their share of Cariboo Pulp's production to Asia. West Fraser markets their share of Cariboo Pulp's output plus Quesnel River Pulp's output to customers located in North America (41%), Asia (29%), Europe (13%) and the balance to offshore customers. (Source: West Fraser Timber Co. Ltd. Annual Report 2005).

1.4 HARVEST LEVELS

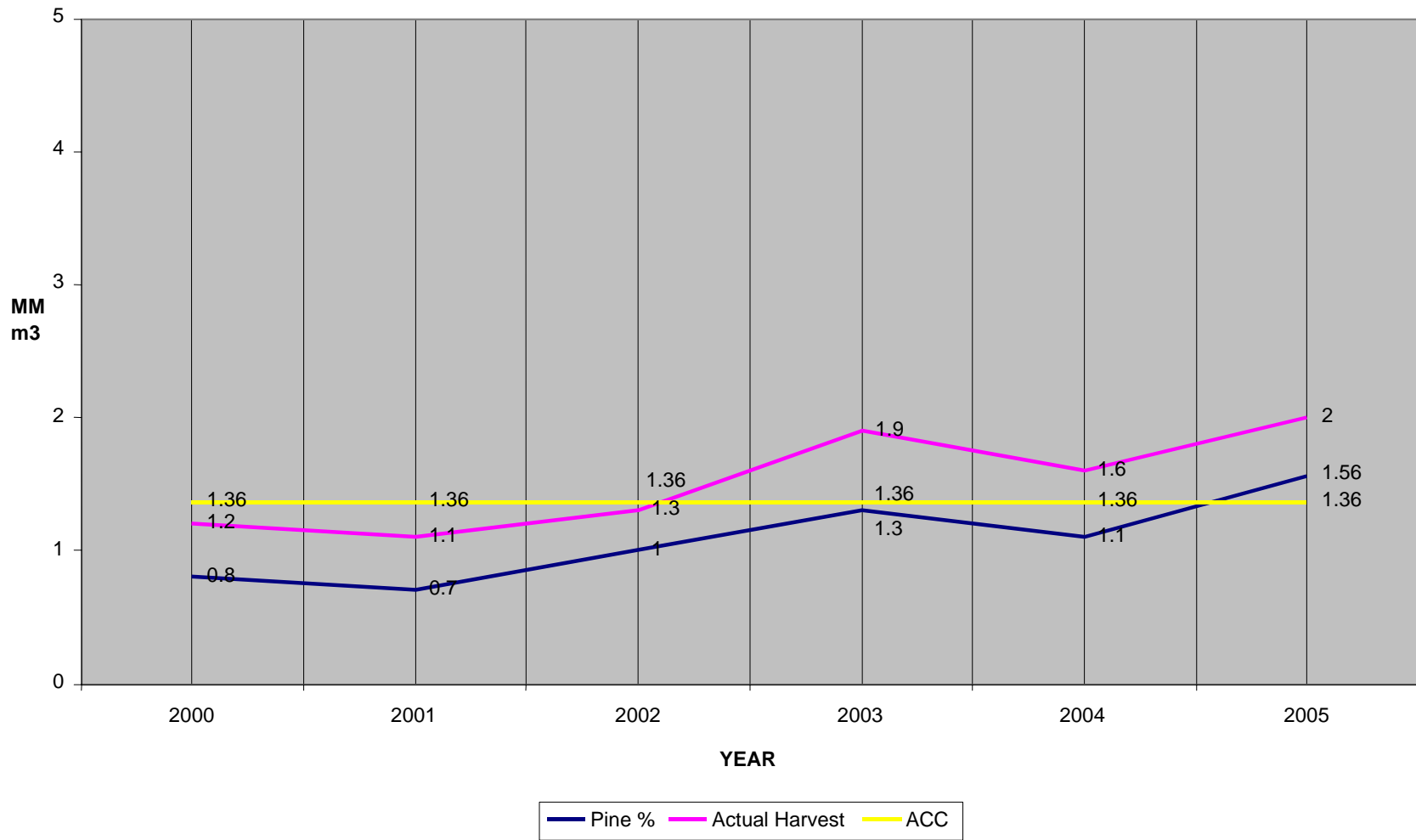
Section 1.2 above describes various management units and how their individual AACs are allocated to different forms of harvesting tenure. Normally the AAC for a management unit is subject to review and re-determination every five years. The rapidly accelerating MPB epidemic has forced more frequent reviews resulting in AAC uplifts. The actual harvest has been steadily increasing to fully utilize the available AAC.

Table 11 and Figures 1 to 4 show the actual harvest on all Crown tenures combined (all TSA tenures, TFLs, WLs, and Community Forests) --see following pages.

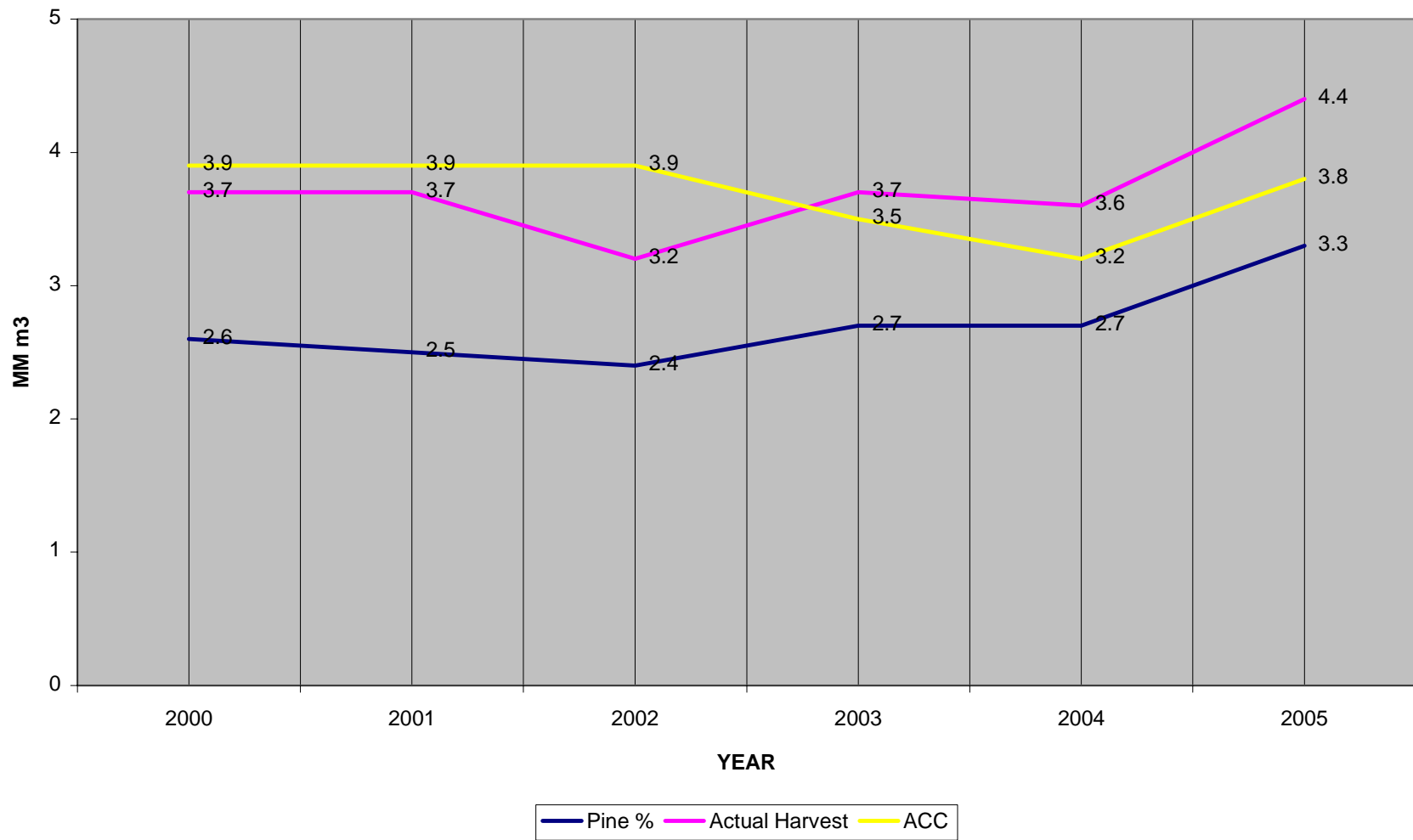
Table 11**Harvest by year in cubic meters (m³)**

	Timber Sales	All Others	Total m³	Approved AAC	% Pine
2000					
Quesnel	699,952	2,599,675	3,299,627	3,103,638	79
Williams Lake	489,565	3,225,720	3,715,285	3,864,063	70
100 Mile House	210,820	992,835	1,203,655	1,362,000	67
Cariboo Region	1,400,337	6,818,230	8,218,567	8,329,701	71
2001					
Quesnel	792,723	2,936,955	3,729,678	4,011,638	75
Williams Lake	461,500	2,981,280	3,442,780	3,864,063	73
100 Mile House	282,549	835,108	1,117,657	1,362,000	62
Cariboo Region	1,536,772	6,753,343	8,290,115	9,237,701	72
2002					
Quesnel	987,344	3,591,137	4,578,481	4,011,638	78
Williams Lake	442,978	2,770,693	3,213,671	3,864,063	74
100 Mile House	323,935	1,048,543	1,372,478	1,362,000	75
Cariboo Region	1,754,257	7,410,373	9,164,630	9,237,701	76
2003					
Quesnel	609,294	4,439,542	5,048,836	4,209,838	77
Williams Lake	695,413	3,015,273	3,710,686	3,825,463	73
100 Mile House	485,181	1,425,264	1,910,445	1,362,000	68
Cariboo Region	1,789,888	8,880,079	10,669,967	9,397,301	74
2004					
Quesnel	653,854	3,914,226	4,568,080	6,241,838	76
Williams Lake	435,850	3,176,669	3,612,519	3,825,463	75
100 Mile House	156,979	1,396,743	1,553,722	1,362,000	72
Cariboo Region	1,246,683	8,487,638	9,734,321	11,429,301	75
2005					
Quesnel	874,112	4,355,233	5,229,335	6,241,838	79
Williams Lake	477,290	3,893,569	4,370,859	3,825,463	75
100 Mile House	342,988	1,703,778	2,046,766	1,362,000	76
Cariboo Region	1,694,390	9,952,580	11,646,960	11,429,301	77

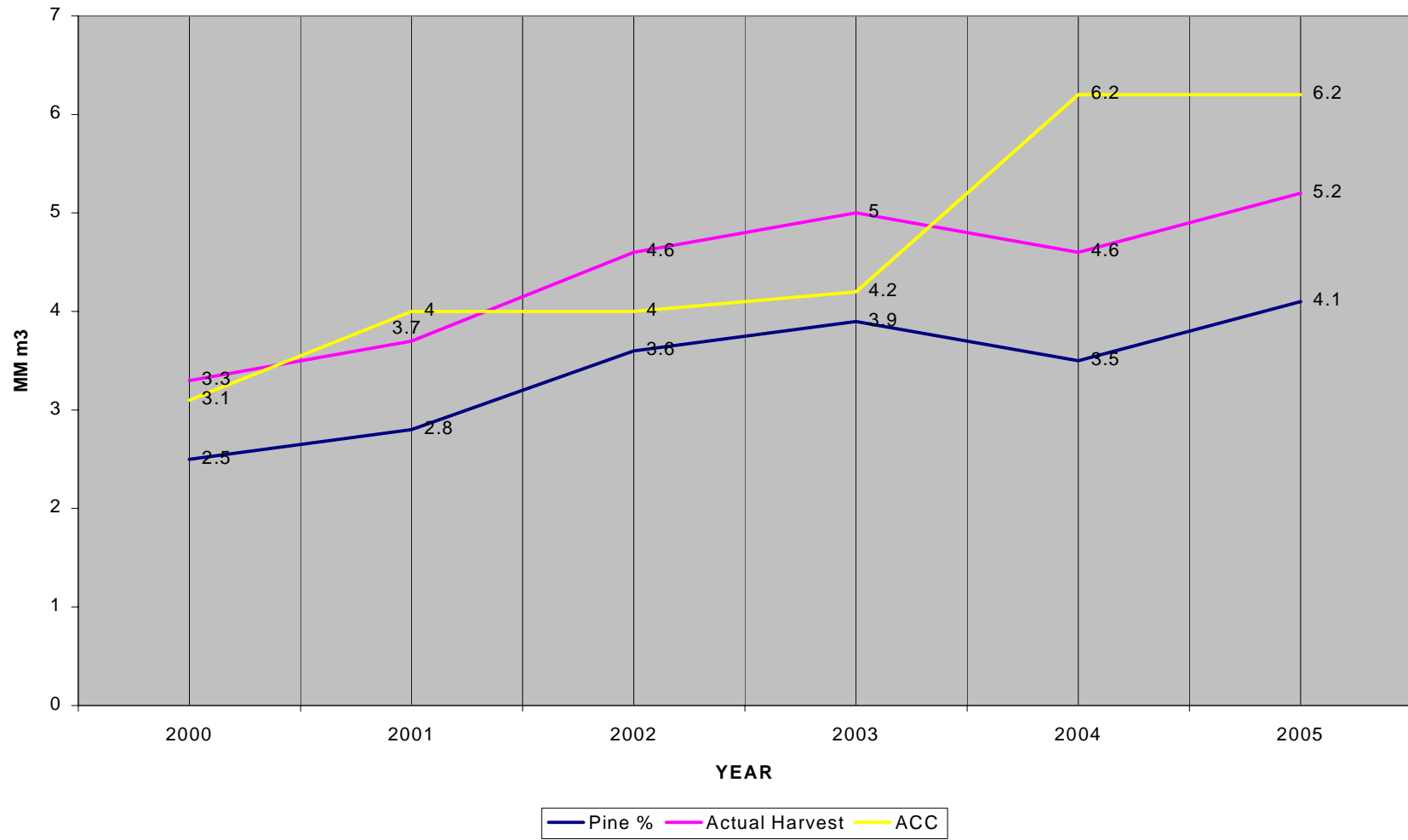
100 MILE HOUSE



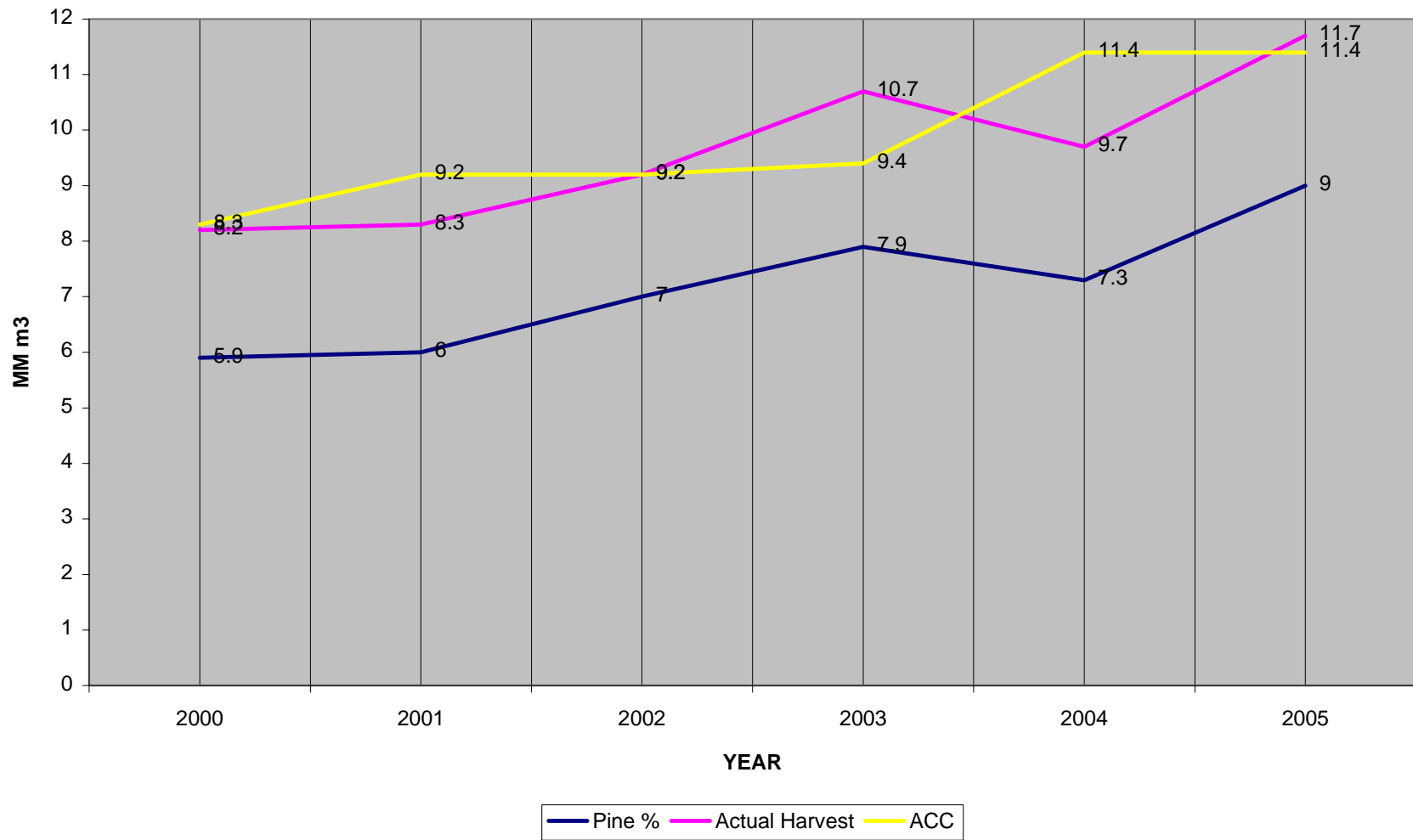
WILLIAMS LAKE



QUESNEL



TOTAL CARIBOO



As can be seen from Table 11 and the following graphs, actual harvest levels have steadily increased over the past five years (mirroring the periodic AAC uplifts). The first AAC uplift in response to the current MPB outbreak occurred in the Quesnel TSA in 2001. Although the uplift became effective July 1, 2001 the actual harvest level didn't increase until the following year due to the required lead time to plan and award new licences. Even at this accelerated rate of cut, vast areas of damaged timber are going unsalvaged and are subject to loss of value or outright loss of merchantability. Further AAC reviews are currently in progress (or have just been completed) which will undoubtedly result in additional AAC increases and attendant harvesting opportunities.

The right hand column in the above table shows the percentage of the total harvest that is lodgepole pine. Predictably the percentage of pine has steadily increased over the six years surveyed but a common criticism is that it is still not enough. There are many reasons used to explain and justify the non-pine component of the harvest. They include:

- Pure pine stands are by definition, any stand where the pine component exceeds 80%. Many of the priority pine stands have a component of other species which is harvested in conjunction with the pine for economic and silvicultural reasons. It is common to find a significant other species component in the higher value pine stands which are often on the best sites.
- Development to access priority pine stands often traverses stands with a significant non-pine component.
- Salvage of stands attacked by Douglas fir beetle, spruce beetle, spruce budworm and fire contribute significantly to the non-pine harvest.
- Mill profile and piece size requirements (e.g. plywood production and oriented strand board production) are a necessary consideration affecting the ratio of non-pine harvest.
- Logging contract agreements and license requirements have traditionally impacted the species profile. (e.g. some licenses are confined to cedar and in some cases there are commitments to specialized logging systems such as cable yarding).
- Constraints imposed by a higher level plan can impact species profile.
- Major harvesting profile shifts had already occurred before the first year of the survey (2000). In the Williams Lake TSA a significant volume was still being harvested from the previous mountain pine beetle outbreak.

In summary, it is reasonable to assume that there will always be some level of incidental harvest of species other than pine associated with pine beetle salvage. It is also safe to assume that other priorities will legitimately drive the harvest into non-pine stands.

1.5 STUMPAGE

Table 12 shows the total stumpage paid for the period 2001-2005.

Table 12

Summary of Stumpage Paid (\$)

	Small Business/BCTS	All Others	Total
2001			
Quesnel	18,675,510	67,528,920	86,204,430
Williams Lake	5,605,160	22,399,820	28,004,980
100 Mile House	7,965,510	14,208,000	22,173,510
Total Cariboo Region	32,246,180	104,136,740	136,382,920
2002			
Quesnel	27,861,627	74,201,468	102,063,095
Williams Lake	5,169,414	18,794,609	23,964,023
100 Mile House	5,982,579	16,378,724	22,361,303
Total Cariboo Region	39,013,620	109,374,801	148,388,421
2003			
Quesnel	12,252,902	63,328,173	75,581,075
Williams Lake	10,438,614	25,256,968	35,695,582
100 Mile House	11,096,089	19,088,942	30,185,031
Total Cariboo Region	33,787,605	107,674,083	141,461,688
2004			
Quesnel	10,618,589	57,537,165	68,155,754
Williams Lake	7,828,578	33,209,854	41,038,432
100 Mile House	3,712,553	23,384,359	27,096,912
Total Cariboo Region	22,159,720	114,131,378	136,291,098
2005			
Quesnel	10,401,933	56,376,675	66,778,608
Williams Lake	8,507,659	39,699,149	48,206,808
100 Mile House	7,751,529	29,131,194	36,882,723
Total Cariboo Region	26,661,181	125,207,018	151,868,139

Caution: Using Tables 11 and 12 to make comparisons of stumpage paid per cubic meter by category (i.e. Small Business versus All Others) may be misleading. BCTS stumpage does not reflect the Ministry's cost of developing and administering the sales program. In addition, the ministry is responsible for basic silviculture under the BCTS program where "All Others" must perform this task at their own expense.

As expected, the increased harvest has resulted in greater direct revenue to the Crown in the form of stumpage. However, the increase in stumpage has generally not been proportionate to the increase in harvest levels. A comparison of Table 11 and Table 12 shows that the 2005 harvest is 52% greater than the 2001 harvest, but the increase in stumpage for the same period is only 11%. This is partially attributable to the fact that harvest has shifted from relatively higher value timber to stands where a significant portion of the stand has been attacked/killed by the beetle and overall stand value has decreased. In addition, prior to April/2006 offgrade (dead logs) were charged at 25 cents/m³.

Changes in the overall harvest profile have triggered a review of current scaling and grading policies in an effort to capture actual stand values. As a result, stumpage payable on beetle killed timber has generally increased.

1.6 GROSS PRODUCT VALUE

The market price for all forest products is subject to enormous fluctuation. Lumber and panel boards are used primarily by the construction industry with most of the local product going to the USA. Pulp prices vary internationally with less than half of the region's pulp production being sold in North America. In spite of the tremendous variation in product prices it is possible to get some general notion of the overall market value of the region's primary forest product output. The following estimate uses general averages from the 2005 period (the last year that this report has harvest data).

In 2005 the portion of the total harvest (11.4 million m³) that went into lumber production exceeded 10 million m³. An average lumber recovery factor would be in the neighborhood of 280 bf/m³. Prices during this period ranged between \$310 and \$400 per thousand board feet. At \$350/mbfm this translates into a total lumber value exceeding \$980 million. Chips are a by-product of the sawmilling process and add an additional approximately \$10/m³ (\$75/Bdu) or \$100 million.

The market value for plywood during this same period was approximately \$390/Msf-3/8 inch basis (source: West Fraser Timber annual report). Total plywood production was approximately 470 MMsf. This would indicate a total product value exceeding \$180 million.

Oriented strand board prices have been one of the most volatile over the past few years ranging from less than \$200/Msf – 3/8 inch basis to almost \$500/Msf – 3/8 inch basis. Using an average value of \$350/Msf and a production level of 425MMsf the total product value would exceed \$148 million.

Pulp values during this period were approximately \$640/tonne (West Fraser Timber Annual Report). The combined production of the two pulp mills was approximately 656,000 tonnes. This suggests a total pulp value of approximately \$420 million.

In summary, although markets and production are subject to significant variation it is not unreasonable to assume that in excess of \$1.7 billion worth of primary forest products are produced in the region each year.

1.7 EMPLOYMENT

Not only is the forest sector the greatest economic contributor to the region it is also the greatest employer. There are normally two categories quoted for employment statistics for a given primary industry. They are: those persons directly employed in some aspect of the industry as opposed to those persons who are employed in an activity that supports the primary industry, in which case, the jobs are termed indirect or induced.

According to the 2001 Canada Census, the Cariboo Regional District had a total population of 70,329 persons with a total labor force of 35,270 persons. The census further notes that the logging and forest products industries directly employ 7,915 persons or 23% of the total labor force. To put this number into perspective, the same report indicates the Mining and Mineral Products industry employs 1.7% of the labor force and the Agriculture, Food and Beverage industry employs 4.7% of the work force (Source: BC Stats). A report titled “2001 Economic Dependency Tables for MSRM/LRMP Areas” prepared by Garry Horne in 2004 noted an income dependency for the Cariboo/Chilcotin as being 36%, one of the highest in the province. The same document reported diversity indices for the Cariboo/Chilcotin as some of the lowest in the province further confirming the importance of forestry to the region.

At approximately the same time as the Canada Census (2001), the Chief Forester made a re-determination of the AAC for each of the three TSAs in the Region. His estimate of direct employment (5,771) compares favorably with the data from Canada Census (7,915) given the slightly different assumptions. The Chief Forester’s estimates are for “person years” of employment, whereas the census data may include less than full-time employment. The Chief Forester’s estimates are for the three TSAs in the region and do not include TFLs, woodlots licences, community forests or private land, whereas, Canada Census data is for the entire Cariboo Regional District. A further variance is the Chief Forester’s estimate includes direct employment that does not reside within the region.

A common practice when estimating employment in the forest sector is to divide the number of jobs (determined by survey or census) by the total volume harvested in thousands of cubic meters to get an “employment ratio”. For example, in 2001, the Chief Forester and Canada census estimated direct employment of 5,771 and 7,915, respectively. The harvest that year was approximately 7,410 thousand cubic meters. Direct employment ratios would calculate to be $5771/7410$ and $7915/7410$ or .78 and 1.09, respectively. In a July 2005, report (for the entire BC industry) done by Price Waterhouse on behalf of the Council of Forest Industries, they determined a direct employment ratio of .96.

A similar methodology can be used to determine indirect/induced employment ratios. The Chief Forester estimated the indirect/ induced ratio to be 1.05 and Price Waterhouse estimated the ratio to be 1.92. Indirect/induced employment estimates include all jobs created by the direct activity province wide (i.e. many of the jobs created are outside the region). The Chief Forester’s estimates of total employment are shown in Table 13.

Table 13

TSA	Harvest Level 2001	Direct Ratio *	Direct No. Person Years	Indirect/ Induced Ratio*	Indirect/ Induced No. Person Years	Total Person Years
Quesnel	2,340,000	.72	1,678	.96	2246	3,924
Williams Lake	3,770,000	.81	3,040	1.08	4065	7,105
100 Mile House	1,300,000	.82	1,053	1.11	1436	2,489
Total	7,410,000	.78	5,771	1.05	7747	13,518

** Ratio is an estimate of the number of person years of employment per 1000 m³ harvested*

The above estimates are based on a 2001 harvest level. Since that time cuts have increased to a harvest of 11,647 thousand cubic meters in 2005 (Table 11). Table 14 estimates the current total employment assuming the employment ratios mentioned above are still valid (using both Chief Forester's and Price Waterhouse ratios for comparison).

Table 14

TSA	Harvest Level 2005	Direct Ratio *	Direct Employment No.	Indirect/ Induced Ratio*	Indirect/ Induced No.	Total Person Years
All TSAs	11,647,000					
Chief Forester Ratio		.78	9,070	1.05	12,177	21,247
Price Waterhouse Ratio		.96	11,181	1.92	22,362	33,543

** Ratio is an estimate of number of person years of employment per 1000 m³ harvested.*

A certain degree of caution should be used when projecting employment ratios forward. Changes have happened within the industry that need to be taken into account:

- Corporate consolidation has undoubtedly affected efficiencies both in the logging and manufacturing aspects of the industry.
- Technology has advanced.
- Recent legislative changes were designed to reduce duplication, increase accountability and achieve overall efficiencies.
- Overhead has not increased at a rate proportionate to the increase in rate of harvest.

Nevertheless, even using conservative estimates, it is safe to assume that the current harvest supports upwards of 10,000 person years of direct employment and upwards of 15,000 person years of indirect/induced employment for a total of in excess of 25,000 jobs.

Almost equally important as the number of jobs is the average compensation paid per job. The forest industry is one of the higher paying industries in the province and even more so in the region. In the earlier referenced Price Waterhouse report they estimated that each person year of direct employment resulted in compensation (including benefits) of more than \$76,000. This translates to in excess of \$760,000,000 in direct payroll within the region. Although indirect/induced jobs tend to be compensated at a lower amount and are spread across the province, it is safe to assume that the total contribution from the Cariboo forest sector is probably 2-3 times that of the direct compensation alone.

1.8 OPPORTUNITIES AND CHALLENGES

The MPB epidemic has already had an unprecedented impact on the resource base and economy of the interior of the province. Change is occurring at a totally unplanned pace. Obviously, an event of this magnitude creates its own set of challenges but it also provides opportunity. Many opportunities are first a challenge.

Opportunities

Fiber supply and shelf life of damaged timber

- The epidemic has brought on stream a large supply of lower value fiber that would have otherwise been available on a steadier, even-flow basis.
- There may be an opportunity to liquidate damaged forests, capture remaining economic value and re-invest in a planned manner.

Products and marketing

- There is opportunity to expand and promote alternate products (e.g. engineered wood products) and take advantage of the special features of blue stained pine.
- Smaller tenures (specifically Woodlots and Community Forests) have the opportunity to expand into both primary and secondary manufacturing to take advantage of local niche markets.

Logging and milling

- There is an opportunity to capitalize on efficiencies of scale and rationalize harvesting and manufacturing activities

Land and resource management

- There is opportunity to promote the harvest and management of non-timber forest products.
- The potential for promoting species of timber with a shorter rotation (e.g. some hardwoods such as aspen, birch and hybrid poplar) must be investigated.
- There is opportunity to develop and implement intensive forest management regimes to produce designer target and/or high yield forests using species selection, genetically improved stock, density control, fertilization, pruning and other intensive forest management practices.
- There is an opportunity to re-vamp and streamline our current way of doing business. This includes management regimes, regulation, collection and use of resource data, forms of tenure, resource planning and Timber Supply Reviews.

Communication

- There is opportunity for better information sharing and cooperation between sub sectors and agencies to achieve common goals.

Challenges

Pricing and Utilization

- At some point stands will become non-merchantable (for any commercial product), at which time a decision must be made whether to rehabilitate and if so by whom and how it will be funded. A major challenge will be to adapt the current stumpage system (or to devise a system outside the current stumpage system) to allow recoverable volumes to partially offset the cost of rehabilitation, i.e. negative stumpage.
- The Spring/2006 scaling changes increase stumpage payable for dead timber which creates a disincentive to deliver poor quality logs.
- Depressed market conditions may cause production cutbacks and/or mill closures resulting in less mill capacity to deal with the problem.
- Incentives could provide a stimulus to utilize larger amounts of damaged timber, e.g. pricing, log grading, etc.
- Log sellers are concerned with the competitiveness of the log market (many sellers, too few buyers).
- Some manufacturers are experiencing difficulty sourcing enough fiber to operate at full capacity giving rise to the question as to whether enough timber is being put on the market.
- The current stumpage system is market based. There is a concern (government) that saturation of the log market will upset the supply/demand balance. An excess of timber in the market place may drive the market price for competitive timber sales downward which would result in a corresponding reduction in stumpage payable on non-competitive timber.
- Industry has a concern that deteriorating stands (logs) may be over valued.
- At the present time, all timber is appraised on the assumption that it will be manufactured in the closest manufacturing facility with barking and chipping facilities (there are a few exceptions). This is termed the “point of appraisal”. Incremental costs to transport logs to a more distant facility must be borne by the operator and are not recognized as a cost in determining stumpage for that timber. This provides a disincentive to transport priority beetle killed timber to facilities that may otherwise be faced with harvesting green wood (e.g. shipping wood from heavily attacked areas to mills in the southern part of the province where salvage requirements might be limited). Government and industry are well aware of this issue but have been unable to come to resolution which would encourage increased salvage.

Fiber and Shelf Life

- The merchantable shelf life for killed or damaged timber . The point at which it will no longer be possible to manufacture lumber with reasonable grade out-turns is also unknown. A better understanding of shelf life variables is required.

- Timing of the projected downturn is uncertain. Merchantability of any given stand varies from less than five years to more than fifteen years depending on a variety of factors including target product.

Products and/or Marketing

- There is a need to develop new products/new industries from increasing amounts of sawmill by-products.
- There is a need to encourage alternate uses for damaged timber and stimulate new industry. The best opportunity to start these initiatives will occur with the current salvage of sawlogs. Sawlogs currently provide the infrastructure to manage, access, harvest, and regenerate the land.
- New markets must be developed.

Logging and/or Milling

- The wood harvesting profile has changed and is not always compatible with harvesting and manufacturing equipment. Harvesting systems will need to evolve to deal with the changing profile as stands start to deteriorate. Milling technology must continue to evolve to maximize recovery from a deteriorating resource.
- Over time less merchantable volume will be recoverable from any given site resulting in increased costs for poorer quality fiber.
- It is essential that flexibility in harvesting equipment and milling technology be maintained in order to respond to other priorities in both the short and long-term.
- Lumber recovery and grade will decline as stands deteriorate.

Safety

- Increased traffic on roads will result in maintenance issues and conflict between road users.
- Safety is becoming an ever bigger issue as overall activity increases, working conditions change and competition gets more intense.

Land and Resource Management

- Stands which are not harvested may become liabilities requiring rehabilitation investment.
- There is a need to locate a source of funds for intensive forest management (to grow designer, high yield forests and to bring intermediate crops on stream more rapidly).
- The mountain pine beetle is attacking and killing pine stands as young as 30-40 years old. Furthermore, it is predicted that virtually all mature pine (of varying ages) will be killed within the next few years. Most pine stands are regenerated back to lodgepole pine and many non-pine stands are currently being regenerated to pine. This suggests that future forests will have a greatly restricted age class distribution (all pine stands ranging in age from 30 years to 250 years will be replaced within a 20 year time span) and the overall land base will have even a higher percentage of pine than currently exists.
- Accelerated harvest with attendant reforestation has depleted seed inventories required for growing planting stock. The beetle has already killed much of the mature timber making it difficult to replenish seed supply in many key seed zones.
- There is a rapidly growing fire interface issue that must be addressed.
- We must develop new best management practices for all affected resources. For example, increased harvest has the potential to result in a short-term increase in forage

production. If harvesting operations are not coordinated with the ranching sector this increase in forage may be a lost opportunity.

- Damage caused by the beetle results in less volume recovered from any given hectare (i.e. a higher percentage of non-merchantable logs and pieces, more decay, more breakage). This means a greater number of hectares must be increasingly harvested to achieve any given AAC.
- The escalating number of hectares harvested each year results in less area being available to support values not compatible with harvesting.
- Existing tenures only grant rights to harvest timber and manage for future timber production. There are currently no forest tenures which specifically encourage practices which promote the production of non-timber products. In some cases (particularly with area based tenures such as community forests and woodlots) it may be desirable to broaden the scope of the license to authorize management for non-timber products.

Communication

- There is a need to identify salvage opportunities suitable for individual sub-sectors and work to remove barriers which hamper recovery of damaged timber (e.g. limitations on small scale salvage are contentious and appear to be inconsistently applied between districts- the appropriate use of this form of tenure must be defined and clearly communicated).
- Strong working relationships between sub sectors and agencies must be developed to ensure maximum effectiveness and efficiency.

Other Factors (many beyond the control of the forest sector and/or local and provincial governments)

- The rising Canadian dollar (more than 40% since 2003) threatens traditional markets.
- Rapidly rising energy costs are raising cost of production.
- The ability to recruit and maintain a qualified work force has become more difficult due to competing industries and the uncertain future.
- There will be a reluctance to invest/live in areas with an uncertain future.
- Industry is competing in a world market. Competitive opportunity must be maintained.
- There is a strong need to ensure parties that commit to act on a specific opportunity carry through and complete salvage operations in a timely manner.
- There is a need for programs which address the rights and interests of First Nations.

2.0 HISTORICAL SECTOR DEVELOPMENT

The forest industry of the Cariboo has a record of being both dynamic and innovative. The Cariboo industry was one of the first jurisdictions to utilize the relatively small wood typical of our pine forests. Efficiency and innovation have made it possible to increase the AAC to utilize more and more of the forest resource.

Mechanization has resulted in huge productivity increases per employee. The Cariboo has some of the most modern, high speed, and efficient sawmills in the business who ship products all over the world.

There has been a significant transition in the woods end of the business in response to the MPB crisis. The increased use of special harvesting systems such as roadside logging and short wood processing has been refined to achieve maximum productivity. Development of specialized equipment for road building, felling, skidding and processing has increased overall logging productivity. In addition, these developments have extended the logging season which in turn allows more flexibility to respond to environmental and production demands. Better quality control and sorting have resulted in a consistently higher quality log being delivered to the mill (Note that the increase in log quality control has corresponded with an increase in non-sawlog fiber being left and /or burned in the bush). Bigger trucks with different axle configurations have resulted in bigger payload.

Sawmills are being upgraded continuously to take advantage of new technology resulting in increased productivity and product and value recovery. Advanced scanning technology allows maximum recovery from every log. Shifting to short log systems has reduced overall defect. Different moisture sorts result in efficiencies in drying. Sawmills are programmed to manufacture each individual log for its maximum product value.

Legislative changes in the last few years, (e.g. Forest Practices Code, *Forest and Range Practices Act*, elimination of mill appurtenancy, market based pricing), have re-defined how our forests are managed and how the industry is structured. Major licence holders have taken on a stronger role in planning and developing the resource as well as assuming a higher level of accountability. Large scale corporate consolidation has significantly reduced the overall number of licensees holding replaceable Crown tenure. (i.e. three licensees now control the bulk of the manufacturing capacity and Crown tenure where ten separate corporate entities previously operated).

The Small Business Forest Enterprise Program has been replaced by a stand-alone organization within the Ministry of Forests and Range called BC Timber Sales (BCTS). The new organization has a stronger commercial orientation and has been created to develop Crown timber for public auction to establish market price and cost benchmarks, and to capture the value of the timber asset for the public.

The Woodlot Program has seen many changes in the last few years. The provincial government has committed to doubling the program in the Cariboo in the foreseeable future. This translates into more Woodlots as well as a doubling of the size of new woodlots. Progress on this initiative has been slow and new opportunities are not currently available. Furthermore, suitable expansion areas are becoming more constrained and contentious due to the accelerated beetle harvest. There are new provisions for transferring ownership of woodlots as well as it now being possible for an individual to own two woodlots. Recent changes to the Woodlot Licence Regulation make it possible for a woodlot licensee to own, lease or control a timber processing facility.

Community Forest Agreements are becoming more recognized as a viable form of tenure. Government has made legislative changes to facilitate the award of new agreements and expand the program. Several communities have been invited to apply for agreements including the Village of 100 Mile House.

3.0 GROWTH OPPORTUNITY AND TRENDS

The AAC is often viewed as the prime regulator of the size of the forest industry. However, it is obvious that the AAC is only part of the equation. In order to capitalize on the opportunity afforded by the AAC there must be a willing industry and a market for the products they produce. Efforts to deal with the MPB crisis have and will almost certainly continue to drive the AAC upward but, in the end, the market may well be the factor which decides our success in salvaging damaged timber. As damaged stands decline in value so too does their marketability. In the end, the market will determine whether a particular stand can be harvested or whether it remains as a damaged asset possibly requiring rehabilitation.

3.1 EXISTING PRODUCTS, EXISTING MARKETS

The United States accounts for 83.3% of all B.C. commodity wood products exports and Japan represents another 11.8% (on a volume basis). China and Hong Kong combined represent the third largest destination with a 1% share. Softwood lumber is the major export product with a 94% share followed by OSB with 3.5% and plywood at 1.4%; (Source: BC Wood Products Trends Analysis in Export Markets, July 2005 by R.E. Taylor & Associates Ltd). Although no specific data for the Cariboo is readily available, it is believed the above numbers show the general trend.

Clearly our high dependence on U.S. markets makes us extremely vulnerable to any market forces with the potential to disrupt our current trading relationship. Exports to the U.S. are heavily weighted to structural products (lumber, plywood, OSB, engineered wood products) which feed the housing market. The housing market has been at the peak of a boom cycle and experts are predicting a significant softening in this demand.

The U.S. dollar has slipped in value compared to many other currencies including the Canadian dollar. The Canadian dollar has increased more than 40% against the U.S. dollar since 2003 and the trend is expected by many experts to continue. Costs are incurred at the higher value Canadian dollar and the market is set by the lower value U.S. dollar which in turn lessens the margin for profit. The lower value U.S. dollar also provides an opportunity for increased competition for the U.S. market from other countries whose currency is not as strong as Canada's.

The Canada/U.S. softwood lumber dispute has finally been resolved (summer 2006). The agreement provides a degree of certainty and although the terms of the agreement are relatively clear it remains to be seen how implementation of the agreement will affect individual operators. Individual provinces may choose different options under the agreement. The option chosen by British Columbia does not guarantee unrestricted free market access for British Columbia forest products. Tariff provisions could severely impede our ability to expand sales and limit our ability to market lumber from accelerated beetle harvest.

Japan's economy seems to be improving and its currency (yen) is increasing in value compared to the U.S. dollar. This has some positive implications for B.C. exports, but competition for the Japanese softwood lumber market from other countries is also increasing.

3.2 NEW PRODUCTS, NEW MARKETS, NEW USES FOR EXISTING PRODUCTS

The current flood of relatively low cost fiber into the market place provides a unique opportunity to pursue new markets for current products and to research, develop and market new products. Market and product development is not the responsibility of any single sector, association, agency, government or institution. Everyone has a stake and research needs are multi-faceted. Research is required in a broad range of areas including: fiber characteristics and suitability studies, domestic and international markets, sales, manufacturing and distribution, relationship to existing markets and existing products, etc.

New Asian markets are promising but will take years to develop.

The *Provincial Mountain Pine Beetle Action Plan* commits the provincial government to work with the existing industry and other existing forest product marketing organizations to maintain and expand markets. Consistent with this action, research is planned or underway by a variety of organizations. The Canadian Forest Service has multiple research projects underway. The provincial government has funded research through several avenues including Forestry Innovation Investment Ltd. (FII), UBC and UNBC. FII funded mountain pine beetle wood product and market programs include Market Access, Product Development and Technology Transfer, Domestic Market Development in BC and International Marketing including a large program in China. Academic institutions are pursuing relevant research as are agencies such as the Forest Engineering Research Institute of Canada and FORINTEK. Private companies are pursuing research specific to their own private interests.

4.0 LAND AND RESOURCE MANAGEMENT ISSUES

By its very nature, any event which has such a broad footprint on the landscape must create a number of challenges and issues. Efforts to salvage damaged timber have a further impact. Some of the multi-resource issues that must be considered and addressed include the need for:

- better understand the impact on biodiversity and find new ways to measure/account for biodiversity. The existing strategies (although constantly being revised) did not contemplate an event of this magnitude. Consideration should be given to emphasis on attribute management versus age based management.
- development of new “best management practices” to aid in managing the long term impacts (of MPB killed stands and salvage harvest) on other resource values.
- a better understanding of critical levels for habitat (fish and wildlife), watersheds, visuals, etc.
- strategies to manage fuel loading, the potential increase in fire hazard and risk, and the degree of difficulty controlling fire.
- understanding the role of non-pine species in the short to mid-term timber supply.
- coordinating accelerated and more intense activities with other resource users such as tourism, cattlemen etc.
- monitoring activities against the Cariboo-Chilcotin Land-Use Plan (CCLUP).

- resolving land and resource conflicts that will become more difficult as the ha/m³ increases and the m³ of AAC also increases. The annual area harvested increases disproportionately. (e.g. if the AAC for the unit is doubled and the recoverable volume per hectare drops to half of the pre-attack volume then the overall number of hectares harvested will show a four fold increase).
- objectives and strategies established under the CCLUP to consider the unique nature of area based tenures such as Community Forests and Woodlots. Area based tenures do not have the same flexibility as volume based tenures to respond to constraints by moving operations to another geographic area.
- a strategic plan with defined objectives for future forests which will guide post-salvage reforestation and rehabilitation. (Current practices could result in future forests that are even more vulnerable to insect and disease than existing forests).

5.0 SECTOR ACTION PLAN

Historically the forest industry in the Cariboo-Chilcotin has been very stable showing relatively gradual but steady growth since the 1950's. The introduction of small wood utilization in the late 1960's and early 1970's sparked a growth peak followed by a short period of relatively slow growth. The MPB epidemic of the mid 1970's caused another growth spurt followed by a lengthy period of very gradual growth. The most recent MPB attack has resulted in a rapid period of growth over the past five years. Due to efficiency and mechanization employment growth has not kept pace with the tremendous long term growth of the industry. This latest period of extreme growth obviously can not be sustained into the long term. "Shelf life" of damaged timber will dictate a sharp decline within an estimated 5-15 years. Market forces always have the potential of destabilizing the industry. Diversification of the industry into non traditional products and markets could have a strong stabilizing effect.

Our response to the opportunities, challenges and land and resource management issues identified earlier in this report will define the future of the industry. Many of the opportunities create challenges and conversely many of the challenges provide an opportunity. Although all of the opportunities/challenges inter relate to some degree there are several common themes which need to be addressed.

5.1 FORESTS AND FIBER

Probably the greatest opportunities and the greatest challenges relate to the fiber supply itself and the duration of its economic value or "shelf life". The provincial forest inventory provides a relatively accurate accounting of the extent and distribution of pine stands. The inventory stratifies stands on the basis of species, age, height, stocking density, and site quality.

The MBP normally attacks and kills new trees in the summer but the trees do not turn red until late spring/early summer of the following year. Aerial surveys and mapping of red and grey trees in late summer/fall creates an accurate picture of stands damaged by MPB (as well as spruce and fir beetle) in previous years. Identification of the current year's damage is somewhat challenging as it can only be done by onsite probing of stands adjacent to the red stands killed the previous year. This cycle of events (an accurate picture

of where the beetle has been the year before with a less accurate picture of where the beetle is currently) has traditionally frustrated attempts to manage and control the beetle through harvesting. Harvesting strategies and priorities have traditionally been guided by the mapping and probing work.

The infestation has now become so widespread and intense that almost all stands of mature pine have been attacked as well as the majority of mature pine trees in mixed species stands. Although immature forests are traditionally not significantly impacted by the beetle, recent trends show extensive damage to these stands as well.

This change in the progression of the infestation has profound management implications. The previous focus was to track the active spread of the infestation and try to prioritize harvest based on location of the current attack. (The theory being that logging stands under current attack maximizes removal of active beetle populations and slows the rate of further infestation). Based on the assumption that virtually all mature pine will be killed it is critical that salvage strategies/priorities be re-examined. Now that the direction has shifted to a purely salvage focus, parameters such as “shelf life”, stand value, product mix, site quality, and impact on non-timber values should play a stronger role in directing future harvest operations.

Prioritizing harvest based on “shelf life” would suggest that those stands with the shortest “shelf life” should be harvested first i.e. target stands based on the rate at which they lose their commercial value. Presumably these stands are often on the moister, better quality sites. These sites also represent the best future management opportunities with the potential for higher long term yields. In order to do this there are key information needs such as date of attack, current stand description, and the rate of deterioration. Each of these “needs” is also subject to a number of variables such as: was the stand killed all at once or over a period of several years, is the stand a mixed stand where pine is only a component of the total volume, is the site conducive to rapid decay etc.?

Basing the priority for harvest on stand value would presumably mean that the most valuable stands are harvested first. The theory in this case is to capture maximum value (and theoretically profit) and maximum return to the Crown. Again, there are many variables that effect stand value such as timber size and quality, logging chance, distance from the manufacturing center etc. A product focus would result in harvesting stands that best complement existing manufacturing facilities without regard to optimizing utilization of the resource as a whole.

Site quality is often cited as a key factor in prioritizing harvest. The basis for using site as a deciding factor is predicated on the idea that it is desirable to get the best sites back into productive new forests as rapidly as possible because these sites have the potential to grow the most volume in the shortest possible time. This will undoubtedly be a critical factor in the mid-long term. The current forest inventory does indicate site quality but its reliability is often suspect as the basis for this determination is the age/height ratio of the existing growing stock. Often other factors such as stocking, disease etc impact this ratio and give a false indication of what the true site quality might be. Additional information such as biogeoclimatic zonation can be used to refine site designation.

Obviously a key consideration in directing future harvest is the potential impact on other resources and values. The distribution and timing of harvest can be manipulated to minimize adverse impacts to non-timber values. Site specific harvest prescriptions also mitigate adverse effects of logging. Many people speculate that the forest industry does not have the current capacity or even the ability to grow capacity in time to utilize all the damaged timber before it loses its commercial value. This being the case it is important to plan and balance the combination of salvage, rehabilitation and no-harvest areas in a manner that will aid in the recovery of non-timber values while still recovering maximum economic value.

The foregoing discussion points to the need for a well designed strategy to guide the (partial) liquidation of damaged timber. Government and industry must work together to make informed decisions on the pace and distribution of the salvage initiative. In order to do this there are key information “needs” that must be addressed. As discussed many of these needs relate to the resource itself. Current inventory data (and beetle mapping) is inadequate for informed decision making.

In addition, our knowledge of the beetle’s impact on immature stands is extremely limited and needs quantification. In modeling for the future we can look at various scenarios that deal with harvest/no-harvest of the mature growing stock but if we do not have an accurate assessment of the immature growing stock we can not predict the future of the forest. Some of the mature stands damaged/killed by the beetle have an understory of immature timber that could provide a mid-term timber supply and soften the impact of the predicted fall down in timber supply. There has been little investigation done to ascertain whether this is a viable alternative. The current inventory, designed to capture the dominant and co-dominant trees gives no information of the location and extent of stands with understories.

The rate at which damaged timber deteriorates to the point of having no commercial value is a big unknown. There are many variables which determine this rate of decline including such things as size of timber, aspect, moisture regime, markets etc. Some research has been done and more is underway. It is unknown to what extent further studies will be able to answer this question. However, local knowledge has proven to be a useful tool in developing modeling assumptions for various scenarios that predict the rate of deterioration from loss of value as a sawlog to the point of no recoverable fiber. At this point there has been no attempt to predict and project shelf life on a stand specific basis. Discussions have focused on very broad geographic areas or broad moisture regimes. In order to maximize recovery and minimize economic loss it is essential that estimated shelf life of damaged stands is mapped and strategic plans developed. Information gained by research or further study can be incorporated at a later date.

There is a common expectation that harvest of other species (Douglas-fir and spruce) will cushion the impact of the loss of the pine component in the mid-term. This assumption may not be valid. Douglas-fir beetle, spruce beetle and spruce budworm are all on the rise and unless these growing threats are managed properly these potential future timber supplies will not be available when needed. Furthermore, as the rate of harvest increases these stands are under increasing levels of constraint to address non-timber values.

In summary, it is apparent that there are critical information gaps that must be addressed in a timely manner. Traditionally government, as owner of the resource, has been responsible for maintaining the base-line forest inventory (exceptions are area based tenures where government has delegated this responsibility to the license holder at public expense). This broad level inventory has normally been considered adequate for strategic planning and timber supply forecasting. This is no longer the case. The current needs are supplemental to the existing inventory data base but are critical for strategic planning and forecasting timber supply. This paper has not attempted to make an all-inclusive list of information needs or the time and resources required to obtain the information. This is best left to inventory experts with input from those parties who need and use the information.

Recommendation

1) A team of government/forest sector representatives be assigned the task of doing an inventory needs assessment with due consideration to project feasibility, timelines, and potential funding.

In order to optimize recovery of damaged timber the harvest must be strategically directed. This can only be accomplished with the cooperation of all parties who hold rights to harvest Crown timber. In the case of existing volume based tenures (major licenses and BCTS), and in the absence of a strategic plan to which all parties can agree and support, harvest planning is based on informally recognized areas of operation and individual corporate management strategies. In the case of new, incremental licenses there is the opportunity to structure the license(s) to address specific harvesting priorities. This is already being done to some extent where licenses have been awarded with geographic restrictions or with specific clauses in the license restricting harvest to stands with specific characteristics (e.g. pure pine with at least X% attack). Identification of harvest priorities for new licenses would be greatly facilitated by an agreed strategic plan.

AACs have been raised in all three timber supply areas to facilitate speedy recovery of damaged timber. New licenses have been and are being awarded to authorize the increased harvest. However, the actual harvest is not always occurring. This could be due to a number of factors including complications of start-up, financing, and changing market conditions. In other cases it would appear that successful bidders are acquiring sales and tying up timber on the basis of speculation. This is particularly noticeable with respect to some of the larger, longer term sales. This trend has alarming implications. First, timber that is authorized for harvest is not being harvested resulting in loss of revenue and public benefit. Second, the timber continues to deteriorate so value is being lost on a continuous basis and third because of this deterioration less volume per hectare is ultimately recoverable thus taking more hectares to achieve the licence volume. The solution to this problem is strategically structuring new opportunities with specific provisions for performance followed by strict enforcement. Generally, the longer the term of the licence, the more critical is the need for performance standards.

In addition, it must be recognized that new opportunities have the potential of jeopardizing the viability of existing operations. The objective of new opportunities is to recover economic value before it is lost. In a situation where the new opportunity is targeting the same profile as existing operations there is the potential to shorten the operational life of

existing operations by depleting the economically viable wood supply long before shelf life becomes an issue. This reinforces the need for a better understanding of the dynamics of stand deterioration and potential shelf life for various product mixes.

There is some evidence to suggest that existing milling capacity is not being fully utilized in spite of recent AAC uplifts and some manufacturing facilities are having difficulty locating an adequate supply of timber at market prices. This may be partially due to the sequence of events that must happen following an AAC increase. First, new licenses must be advertised and awarded and second the new license holder(s) must plan and develop specific areas for harvest. It is not uncommon for there to be an interval of up to a year between AAC increases and the wood to first start appearing on the market. In addition, there has been little activity on some of the larger licenses awarded in the past. The reason for inactivity may relate to development of infrastructure, changing/developing markets, financing or a variety of other factors. In any case, the wood is not entering the market place as planned.

The adoption of the interior market pricing system may also be a factor in determining how much wood will be put on the market at any given time. A surplus of wood will result in an oversupply situation which will logically drive down the price for competitive timber. The value of competitive timber is used as a baseline to set stumpage for all Crown timber. Hence, there may be a reluctance to fill the market demand. The system is predicated on a market balance between supply and demand.

Recommendation

- 2 *Government and forest sector representatives should consider jointly developing strategic plans to coordinate overall salvage effort and direction. (This already happens to some extent however the initiative must be strengthened to be timely and to achieve maximum effectiveness).*
- 3 *Government and industry must work together to ensure optimum utilization of existing milling capacity before encouraging development of additional capacity. This includes ensuring wood planned for the market gets to the market and ensuring ongoing monitoring of the supply/demand balance.*

5.2 PRICING/MONETARY ISSUES

In general, there are three broad scenarios that dictate the fate of stands attacked and killed by the beetle in the working forest. As a first priority, (where other values don't preclude), damaged timber should be salvage logged. Second, where logging is not possible and subject to a variety of factors, the site might be rehabilitated. Third, the site may be left to recover naturally.

The bulk of the beetle damaged timber has always been considered part of the commercial forest to be managed, harvested and regenerated on a somewhat sustainable basis. The cost of regeneration is considered part of the overall cost of harvesting and must be accomplished according to strict standards and timelines. The only thing that has changed due to the pine beetle is the time frame over which these stands must be harvested if they are to have any commercial value. Timber that was previously not envisioned to be harvested for several decades must now be harvested in the next 5-15 years. This may or

may not be possible based on a variety of factors foremost of which is the capacity of the industry to utilize the timber.

One of the key drivers affecting industry's capacity is the profitability of salvage-if timber can not be salvaged profitably it won't happen. Profitability is also subject to a number of variables including: the primary value of the asset, the price to acquire rights to the asset (stumpage), the cost of converting the asset into a manufactured product and the market price at which the product can be sold. Most of our traditional forest products are subject to foreign markets which are somewhat beyond our control. The industry has some control over harvesting and manufacturing costs and are already considered some of the most efficient and advanced in the world. Stumpage varies up and down according to the estimated market value of the stand. However, in the case of damaged pine stands the value of the primary asset is in a state of decline. This implies that even if markets are good and production costs remain competitive there comes a time when a given stand of timber can not be harvested profitably into traditional markets. Other products and markets may be an option but the same rule ultimately applies. When the primary asset in a working forest becomes depreciated to the extent that it can not be commercially harvested (given current license parameters) it potentially becomes a liability. Investment (rehabilitation) is required to maintain the site as a contributor to the working forest or the parameters of the license must be changed to again make the stand commercially viable.

Existing harvesting licenses as well as current timber pricing policies are structured around the profit principle. That is to say that the licenses authorize harvest of Crown timber subject to certain terms and conditions including payment of stumpage and reforestation and assume there is a profit motive to harvest.

In the working forest it can generally be stated that it is in the public interest to keep lands in a productive state (unless lands are designated as having a higher value for some non-timber use). As previously suggested, damaged timber is harvested, rehabilitated or left to the whims of nature. Harvesting or rehabilitation return the site to a productive state in the shortest time possible. Stands left to nature will return to a productive state over time but it may be a very long time and production may be limited. Harvesting is limited by profitability and rehabilitation is limited by available funding and a suitable delivery mechanism. Therefore it would seem prudent that all efforts be made to encourage harvesting with incumbent responsibilities to the maximum extent possible. Where it can be demonstrated that harvesting is no longer a viable option, innovative rehabilitation alternatives must be explored.

Stands of timber damaged by MPB are on an economic continuum. As the stand deteriorates, its commercial value declines. Assuming that harvest was at one time viable (under a given set of conditions) as the stand deteriorates it becomes marginally viable, then marginally unviable until ultimately there is no commercially economic value left in the stand. Until the final phase of this continuum, there is some economic value remaining in the stand that could be captured. However, once the stand moves past the point of profitable harvesting any activity must be classified as rehabilitation, not commercial harvesting. The public bears a lost opportunity cost for merchantable stands not harvested and for which the province may incur the cost of rehabilitation.

Rehabilitation of damaged stands of timber has happened in the past but never on a scale comparable to what might be required to deal with the current situation. There is no standard delivery vehicle for rehabilitation. Traditionally any rehabilitation projects on public land have been by direct hire of contract equipment on an hourly basis or awarding contracts (usually competitive) to deliver the site into a specified condition. Any commercial timber on the site has usually been decked for future disposal or authorized for removal by the contractor and factored into the contract price. This recoverable volume has normally not formed part of the AAC.

The current situation requires a re-examination of how salvage and rehabilitation might be most efficiently accomplished. The existing AAC as determined by the Chief Forester assumes timber within the cut is commercially viable – when it becomes uneconomic it is removed from the cut calculation. As time progresses more and more stands of timber will move from the stand alone, commercially viable side of the equation to the uneconomic side even though they represent a significant portion of the AAC and even though a significant component of the stand is well suited to manufacturing. It is essential that ways and means be found to encourage the harvest of damaged stands beyond the point where they are profitable as a whole, on their own. Industry has no aversion to this notion as long as overall profitability can be maintained.

There are many ways to structure an incentive program that would allow harvest to continue past the economic break-even point. An example might be to provide the opportunity to blend better timber stands (merchantable) with poorer timber stands (non-merchantable) resulting in an operation that is viable overall where formerly only a portion was viable. Stumpage would be based on the whole so some high stumpage bearing wood would offset the negative value wood. A similar example might see licence holders given a stumpage credit for harvesting stands that have a negative value that could be applied against stumpage owed from stands harvested with a positive stumpage value. The basis for establishing stand value would continue to be a function of the current market based pricing model where market forces dictate stumpage and timber that can not be sold obviously has a negative value. Incentives under federal/provincial tax laws are another possibility. Another incentive might be relaxation of tenure obligations where the province might assume responsibility for development, reforestation etc.

It is recognized that timber pricing is a highly contentious issue and very sensitive to foreign pressure and criticism of unfair competition. Nevertheless, if the Crown is left with a devalued resource that will require significant expenditure of public funds to keep lands in a productive state for the long-term public benefit then there should be a means to encourage the investment in the most efficient manner possible.

It is also essential that any disincentives for maximum recovery be removed. Current utilization standards discourage recovery of certain classes of marginal wood (e.g. grade 4). If this marginal wood is harvested and brought to the manufacturing facility it is charged against the licence holder's allowable cut and a nominal stumpage is billed. If the same piece of wood is left in the bush there is no charge to the AAC, no stumpage payable and

no penalty assessed. Knowing that all wood brought to town will be charged against the licence's allowable cut, why would a licensee take a chance on a marginal piece of wood? If this grade of wood was not charged to the licence's cut much more of it would come to town. A similar situation exists with deciduous volumes.

The "point of appraisal" issue acts as a strong deterrent to anyone wishing to transport logs beyond the nearest point of manufacture in spite of the fact that the nearest facility might already be inundated with timber and have no ability to manufacture additional volumes.

The existing tenure system was designed to give industry access to primarily healthy, high value Crown forests on an even flow, sustainable basis. Generally, individual licenses targeted specific types of timber (size, species etc.) that was best suited to a unique manufacturing facility. This resulted in a high level of recovery from the site. In an effort to recover as much damaged wood as possible as well as minimize impact to mid-term timber supplies, all licenses are now being asked to target damaged pine stands regardless of the match between the timber and the wood profile requirement of the mill. The result is relatively large quantities of wood, not suited to the mill, being left behind even though it may have commercial value.

In some cases, a third party may be interested in recovering some of the fiber left behind but it is often difficult to gain access to the site. The Crown is in an awkward position to grant access as it would result in a tenure over a tenure. The primary harvester has legal obligations on the site until it is reforested and declared free growing-usually several years. The primary harvester has built the infrastructure on the site (roads and landings) and is responsible for their maintenance and/or rehabilitation. There is little incentive and a certain degree of risk for the primary harvester to cooperate with a secondary harvester.

The forests have changed and perhaps the tenure system should be adapted to better reflect the opportunities. Traditionally, licenses focused on harvesting timber with reforestation and the growing of future timber viewed as a necessary byproduct. Many of the future opportunities focus on rehabilitating sites and getting them back into production-recovery of merchantable timber is the byproduct. The current condition of the forest suggests a greater number of licenses, if not all, should have a stronger stewardship focus.

Recommendations

- 4) *Government and industry should develop an incentive program to ensure maximum recovery of damaged fiber.*
- 5) *Incentive programs should be developed to encourage the salvage/reforestation of marginal stands.*
- 6) *Government and industry should explore existing practices and remove any disincentives. This includes having a "fresh" look at "point of appraisal".*
- 7) *The tenure system should be re-examined to ensure it is achieving desired results.*

5.3 PRODUCTS AND MARKETING

Sections 3.1 and 3.2 of this document discuss the current market situation for British Columbia forest products and identify a growing need for new product development and

market diversification. Significant private and public research dollars are being invested in the search for new and better uses of our timber resource. Major initiatives by federal and provincial governments as well as the private sector are exploring new market opportunities. The bulk of this work is beyond the scope of this project.

However, even a cursory examination of the topic points to a need for strong communication among all parties particularly in the research field. The MPB epidemic has created a tremendous need for market and product research as well as a broad array of other topics. It is not apparent that the research effort is being coordinated to the extent possible and overall widespread awareness of research activities appears lacking. Large organizations and government agencies are more likely to be well informed, particularly if they personally engage in research. Obviously some research is proprietary in nature and some research is based on a personal interest. Different researchers and research bodies specialize in specific fields of research. Nevertheless, it is desirable for existing operators, potential investors and people in need of specific types of information to have easy access to research results as well as ongoing and proposed research. This issue is not new and various initiatives over the years have attempted to address the problem with research notes, reports, assigned bodies to act as a research “clearing house” etc.

Research in B.C. is currently strategically managed by the Forest Science Board appointed by the Deputy Minister of Forests and Range, comprised of individuals from government, industry and First Nations backgrounds. On a national scale, the Board of FPInnovations directs the operations of that organization. To further enhance coordination and strategic alignment of research priorities, the province, federal government and forest industry fund Research Opportunities BC. The non-profit society, FORREX, maintains the Mountain Pine Beetle Information Portal. This website provides access to the MPB Bibliographic Warehouse, the MPB Event Catalogue, in excess of 25 other catalogues housed in the Natural Resource Information Network and access to the ‘barkbeetlelinks’ website developed by the McGregor Model Forest.

Recommendation

8) *Government and industry take the lead in strengthening efforts to coordinate, direct and communicate research efforts.*

A major challenge is the link between product and market development and the resource opportunity. Currently opportunities are defined primarily by sawlog opportunities. Most modeling exercises are tailored to estimate the flow of sawlogs over time. This is rapidly changing. Many of the existing stands damaged by the beetle are not and never have been sawlog quality and as time progresses and wood deteriorates many stands that were once suitable will no longer be merchantable to a sawlog economy. Primary products from sawlog grade timber are lumber and plywood, both of which are deemed relatively high value products.

Beetle killed timber is suited to a vast array of potential primary products. However, any new primary product has to compete with the sawlog economy to garner a share of the resource supply and this is very difficult given the costs of manufacture of some of these alternate products and/or the final value of the alternate product. Markets for alternate

products might also be very limited. For example, much of the beetle killed timber is perfectly suited to pulp, oriented strand board, bio-fuels etc, but these markets can not normally compete with the sawlog economy to corner a share of the supply. It would seem that the best opportunity for many of these alternate product producers is to target stands that have little or no value to the sawlog industry and/or to work with the sawlog industry to utilize non-sawlog material in a sawlog stand or to use sawmill byproducts.

At the present time there is very limited knowledge of the nature and extent of non-sawlog stands of timber. The focus to date has been to identify sufficient sawlog stands (usually the higher value, better quality stands) to fulfill existing allowable cut limitations over a reasonably short term planning horizon. The overall infestation has been aerial surveyed and mapped and there is some inventory data supplemented by local knowledge to describe the general quality and condition of damaged stands (Naturally, quality and condition are constantly changing on a downward trend). However, this level of knowledge falls far short of being able to match supply opportunities to specific product opportunities.

There is some knowledge as to the amount and type of non-sawlog fiber left on site after harvesting. This obviously varies with different stand and market conditions and would require some level of study to accurately predict and quantify the opportunity wood available. It is a given that as stands deteriorate an ever larger component of the stand will become unsuitable for sawlog and unless some other product opportunity can utilize this material it will be left on site or burnt.

There is significant knowledge of sawmill byproduct and waste material at any given point in time. There are many variables that affect mill falldown such as: utilization standards, log quality, mill efficiency, end product mix and value of byproducts. It stands to reason that an ever larger proportion of the wood brought to the sawmill will not make lumber and would be available for other products.

In the first scenario (defining non-sawlog stands), if and when the inventory is refined, there should be a relatively accurate picture of what types of opportunities (including wood quality, quantity and time period of availability) might be available for manufacture into a range of different products. Licenses could be advertised and awarded to target different sectors of the industry.

In the second and third scenarios (non recovered fiber in sawlog stands and sawmill residue), any available opportunity is a byproduct of an existing license holder's logging or milling operation. This means the existing industry controls the opportunity potential and may or may not choose to capitalize on it (risk and incentive) Furthermore, as stands deteriorate, these same licensees will affect an increasingly larger piece of the potential opportunity as they will have to log more hectares to achieve the same sawlog allowable cut. (See discussion in previous section relating to tenure).

Recommendation

9) *Government and industry must cooperate to identify the nature and extent of potential opportunities. At this time no one has presented concrete, immediate solutions to the*

overabundance of fiber. This suggests that there is too much risk (fiber, costs, markets) and not enough opportunity/incentive.

5.4 LOGGING AND MILLING

The forest industry of the region is recognized as having some of the most technologically advanced and efficient operations in the world. One of the keys to achieving this status was the ability to be innovative and adapt to changing wood supplies and markets.

The beetle epidemic has totally disrupted planned wood supply and has had a significant market impact. Nevertheless, the industry has been relatively successful in modifying and adapting harvesting systems, log hauling configurations and manufacturing processes to match the changing profile. There is little reason to suspect that left to their own devices this trend will not continue into the future.

A key to achieving harvesting and manufacturing efficiency is being able to accurately forecast future harvesting opportunities. As previously mentioned elsewhere in this report more work is required in this regard. This applies to both the existing industry matrix as well as any potential alternate uses of the wood.

5.5 SAFETY

The forest industry has been recognized as one of the most accident prone industries in the province. The increase in harvest due to the beetle has aggravated the situation. The combined drive for high levels of production coupled with increased activity both in the bush and in the mill can create a more dangerous environment to work in. Further risk is found with increased traffic on backroads and highways, increasing numbers of inexperienced workers, and increased interface with the public and non-forest workers. The existing infrastructure was not built for this level of activity.

Government and industry have already recognized the trend and are proactively taking steps to remedy the situation. Safety is everyone's business. The relatively recent "Work Safe Program" demands a commitment to safety.

5.6 COMMUNICATION

Any increase in the rate of change creates a need for increased communication. Policy and legislation changes, industry and government restructuring, and the impact of the pine beetle have all changed the work environment and stretched lines of communication to the limit. The need for fast and effective communication has never been greater. In some cases the level of communication is inadequate. In other cases, there is almost a "communication overload" – people can't keep pace with the change.

In order to effectively manage the beetle crisis there is a need for better communication. Common goals can only be achieved by better information sharing and cooperation between the various industry sub-sectors and government agencies. Lack of communication/cooperation between sub-sectors results in lost opportunities. Actions by government agencies without adequate consultation and communication result in disruption

and overall lack of effectiveness. Legislative changes have altered the role of the major licence holders and government agencies. They must examine their respective role in communication/collaboration respectively.

Methods of communication must also be examined. Many of the joint management committees either no longer exist or have ceased to be effective.

Recommendation:

- 10) *Communication protocols between government agencies and various sub sectors must be strengthened.*

5.7 LAND AND RESOURCE MANAGEMENT ISSUES

The CCLUP resolved outstanding land use conflicts and set the basis for how the public forest will be managed. The Plan created 17 new protected areas and divided the remaining land base into three broad land use zones with specific zonal targets for each of the resource sectors. Within each of the land use zones the forest land base was stratified into three broad categories: harvest, modified harvest and no-harvest. For analysis purposes these categories can be grouped under two general headings: the timber harvesting landbase (THLB) and the non timber harvesting landbase (non-THLB). The following table provides a summary of the total mature timber volume and the total pine volume on the THLB and the non-THLB (note: these are volumes in cubic meters, not hectares):

Table 15

Summary of Landbase (THLB and Non-THLB) and Species (Pine and Non-Pine) Merchantable Volume in cubic meters (m³)

Landbase	Species				Total	% Landbase
	Pine	% Landbase	Non-Pine	% Landbase		
Non-THLB	136,349,820	32.0%	157,960,734	39.6%	294,310,555	35.7%
<i>% Species</i>	<i>46.0%</i>		<i>54.0%</i>		<i>100.0%</i>	
THLB	289,618,119	68.0%	241,361,647	60.4%	530,979,767	64.3%
<i>% Species</i>	<i>55.0%</i>		<i>45.0%</i>		<i>100.0%</i>	
Total	425,967,940	100.0%	399,322,382	100.0%	825,290,324	100.0%
<i>% Species</i>	<i>52.0%</i>		<i>48.0%</i>		<i>100.0%</i>	

Source: Table 15 is reproduced from a report titled “Short Term Timber Supply Results” prepared by the Cariboo Licensee Land Use Strategy Committee from an analysis done by Cortex Consultants Inc. as part of the CCBAC initiative. The analysis incorporates the CCLUP land-use constraints to the extent possible and models no-harvest zones (caribou, old growth, critical fish habitat, special concern areas Goal 2 parks, visual quality concerns, hydrologic stability constraints, mature+old habitat retention requirements and the biodiversity strategy).

The information provided in this table is significant in that it defines the forest estate and more specifically what portion of the estate is available for timber harvesting. Specifically, as indicated in the final column, only 64% of the mature timber in the CCBAC (CCLUP) area is even potentially available for harvest. Almost 300 million cubic meters of mature timber (36% of the total) is under no-harvest designation. Approximately one third (32%) of all the mature pine in the CCBAC area is in the non-timber harvesting landbase (no-harvest area). Any fear that bark beetle salvage will result in liquidation of all pine to the detriment of all other resource values is clearly unfounded.

CCBAC has a stated objective of maximizing the harvest of damaged timber and recovering the most economic value possible. A second objective is a consequence of the first and it is to minimize areas requiring rehabilitation. Table 11 shows the AAC (year 2005) as being approximately 11.5 million cubic meters per year (almost 14 million in 2007) and the proportion of pine harvest as being 77 per cent. At this rate of pine harvest, it would take almost 33 years to harvest the 290 million cubic meters of pine (first column) indicated in Table 15 on the THLB. This is well beyond even the most optimistic estimations of potential shelf life for damaged timber.

Various strategies (e.g. biodiversity, mule deer winter range, mountain caribou, old growth, riparian) were developed under the umbrella of the CCLUP. Their purpose was to guide the implementation of the CCLUP and provide a blueprint for how the various resource targets (particularly non-timber) could be achieved.

The strategies were built at a time when forest conditions were considerably different than they are today. There have been periodic amendments and refinements as a result of the changing conditions and assumptions. However, the impact of the pine beetle is so vast that it would be timely to re-examine the strategies (no changes to targets) to determine if the non-timber targets of the CCLUP are still achievable. If it is determined that the strategies will not result in the desired outcome an entirely different approach may be required to achieve established targets.

Strategies should focus on the desired forest condition for sometime in the future. The MPB has presented a unique opportunity to design our future forests to achieve both non-timber and timber objectives. Large scale salvage and rehabilitation will result in vast areas of relatively even-aged timber. There is a high risk that current practices will result in future forests that are even more vulnerable to catastrophic events than the current stands. Due consideration should be given to predicted “climate change”.

Vast stands of green mature lodgepole pine are being replaced by a mosaic of unsalvaged timber, partially salvaged stands of timber, and harvested areas with higher than normal levels of post harvest residue. In addition, the extensive areas already harvested are showing marked increases in grass production. This has severe fire implications. Although some strategic planning has already occurred there is a growing urgency for action particularly in public interface areas.

Recommendations:

- 11) *Line agencies responsible for the development of strategies should consult with other CCLUP participants and examine the current strategies and if necessary plot an alternate approach.*
- 12) *Government and industry should strategically examine (for timber purposes) the forest characteristics present practices will yield, analyze opportunities and agree on a future course of action.*
- 13) *Government and industry must work with communities and the public to develop strategic fire protection plans.*

6.0 LOOKING TO THE FUTURE

Forest planners use timber supply computer models as a tool to predict the future state of the forest resource. In the early stages of the CCBAC initiative (October/2005) the Cariboo Licensee Land Use Strategy Committee (CLLUSC) made a proposal to do short and mid term timber supply modeling on CCBAC's behalf. Results of short term modeling were available in 2006 and the mid term analysis became available in June of 2007. A report dated October/2007 entitled "Timber Supply Modeling" Data Assumptions and Results is intended to accompany this strategy document. Pages 11-22 of the report provide details of the models and the assumptions used in this initiative. Figure #3 (page 18) of this report defines the timber harvesting land base (THLB) as well as the non-timber harvesting land base (Non-THLB). Only the THLB was modeled. (In order to understand the results of the modeling exercise it is essential to closely study this report).

The short term (30 years) was modeled assuming two different rates of harvest. Figure #6b (page 26) and figure #16b (page 38) in the report show how the volume of the forest estate might change over time. In both scenarios the standing timber volume at the beginning of the model cycle (approximately 530 million cubic meters) is depleted in annual increments by logging (the volume logged is represented by cross hatching). The most important observation from these two figures is that at the end of the cycle a significant quantity of standing dead pine remains. Even using the most optimistic shelf life assumptions this timber is no longer merchantable and is considered lost. In fact, using the assumptions generated in Figure #4 (page 20) of the report it is obvious that the amount of standing dead pine at the end of the planning horizon will be much greater if harvesting is dependent solely on the sawlog economy. Furthermore, future timber production from the land base which this unsalvaged timber occupies is delayed and/or requires rehabilitation. It is easy to visualize how increased harvest levels in the short term will result in increased economic benefit and at the same time bring land back into production sooner.

It is also apparent that the sawlog industry is not capable of using much of this volume before it becomes non-merchantable for lumber production. Other, fiber based industries are required to maximize recovery and extend the economic life of much of this timber. The short term analysis clearly shows the “boom” side of the mountain pine beetle equation-a great deal of timber must be liquidated in a very short time or it is lost and becomes a liability. A second observation is that any harvest beyond the short term will be heavily dependent on the standing non pine component.

The mid-term analysis (20-60 years from now) was completed in early summer/2007. Three separate scenarios were analyzed. The first scenario is basically a status-quo sawlog harvest option. This scenario is constrained by limiting the extent that total standing inventory can be drawn down and by mandating an even harvest flow in the mid-term. The second scenario extends shelf life and removes the drawdown/even flow constraints of scenario 1. Scenario 3 assumes new, fiber based industry(s) will evolve and work cooperatively with the existing sawlog industry resulting in recovery of much of the volume that would otherwise be lost.

The analysis of these three scenarios confirms many of the points we learned from the short-term analysis. First, either use it or lose it-approximately 220 million cubic meters of pine will be either harvested or lost (based on sawlog shelf life estimates) from the inventory over the next 10 years (see pages 49-51 of the report). Unless other, fiber based, industries are developed this volume will be lost from the economy and the growing sites will become potential liabilities. Second, mid-term harvest levels are dependent on non pine stands until later in the analysis period when regenerated pine stands start again becoming available. Third, different strategies on how we approach salvage and/or rehabilitation and how we manage remaining growing stock can yield tremendous differences in results. Figure #26 (page 61) of the report demonstrates the difference in yield over a 100 year period that could result from a commitment to different management strategies.

CCBAC is committed to capturing the greatest possible economic value from damaged stands while at the same time mitigating the downstream adverse impacts of the beetle. The results of this modeling exercise suggest there are critical decisions that must be acted upon with the least possible delay. These choices not only define the magnitude and length of the boom cycle and the opportunities created in the short term but they also allow us to define the forests of the post-boom era and the potential industry these forests support. It is also clear that as damaged stands deteriorate their value for the sawlog industry diminishes but their value for other potential fiber based economies will prevail for many years. Stand (and individual tree) deterioration follows a gradient-it is not a question of sawlog today and fiber tomorrow. The sawlog industry and potential fiber industry(s) depend on the same hectare of forest for their raw material. The two industries must work together to recover the greatest economic benefit from each tree and each stand of trees-lumber output will decline and hopefully be replaced by a corresponding increase in fiber based products. Government policy can act as an obstacle or as an incentive to this needed transition.

7.0 FOREST SECTOR STRATEGY ACTION PLAN SUMMARY

The Forest Sector Strategy identified several issues affecting the health and viability of the forest industry as it relates to the mountain pine beetle infestation. The Strategy contains thirteen recommendations aimed at specific areas of the overall beetle management initiative which require attention.

Issues identified can be categorized as current issues affecting immediate operations; as mid-term issues potentially impacting timber supply in the immediate post-beetle time frame or; long-term future issues impacting forests over the entire rotation. In order to resolve the identified issues there is an overarching need for greater coordination and communication among and between all parties impacted by the epidemic. The problem exists both internally and externally between various levels of government, levels of industry and the various industry sub-sectors. It is not possible for CCBAC to independently resolve these issues or even take a lead role in their resolution without general agreement by relevant parties of the issues' validity and the need for coordinated action.

This being the case, it is essential that key people in government and the forest sector meet and agree to work together in a steering committee role to provide direction and resolve the issues. Suggested participants would be at a senior level (preferably at the corporate chief forester and government assistant deputy minister levels). Timely and consistent communication would be a key part of their mandate. Working committees would be established as required. CCBAC should take the initiative to government at the earliest opportunity.

Issues requiring attention

Current

- Establish a coordination/communication protocol (Recommendations 8 & 10).
-Assign tasks and empower specific parties to get things done. (Steering Committee role)
- Maintain community stability by protecting existing investment and ensuring the maximum use of existing industrial milling capacity. Initiatives to develop new industry/new capacity should not jeopardize the health of the existing industry (Recommendation 3).
-coordinate the strategic direction of the salvage effort (Recommendation 2). (Working committee established by steering committee for their approval)
-identify new opportunities (Recommendation 9). (Working committee)
-use incentives to recover maximum damaged fiber (Recommendations 4, 5, & 6). (working committee assigned this specific task)
-changes to the tenure system (Recommendation 7). (Government consultation process)

Mid-term and Future Issues

- Define future forests (Recommendation 12).
-identify investment priorities (Working committee)
- Examine landscape objectives/CCLUP strategies (Recommendation 11).
(Agencies/Board with CCLUP mandate in cooperation with industry)
- Identify inventory/information needs (Recommendation 1) (working committee)
- Develop fire protection plans (Recommendation 13)
(Government/industry/community working groups)

Action Plan and Budget

Recommendation #1: A team of government/forest sector representatives be assigned the task of doing an inventory needs assessment with due consideration to project feasibility, timelines, and potential funding.

Action:

CCBAC to sponsor a two day facilitated workshop of forest sector and government planners/inventory experts with the following objective:

- define the status quo
- identify specific inventory needs required for informed planning/decision making
- identify work done and/or in progress
- identify information gaps
- map action plan to fill the information gaps

The action plan must be task and time sensitive recognizing what baseline information is required, reasonable and feasible timelines to acquire such information and cost and availability of resources. (i.e. timing of required decisions will drive the product).

Timing of workshop: spring/2008

Responsibility: Regional with provincial level input

Estimated Cost: \$15,000

Examples of specific inventory needs:

- survey and mapping of damaged immature stands
- assess/identify criteria/map stands with understory potential
- identify/map stands that will definitely not be harvested before being lost (regardless of product)
- define/refine parameters that track stand deterioration (shelf life) for various products
- other

Timing: projects to commence 2008 and carry on to completion

Estimated cost: to be identified in scoping workshop (\$250,000+ in first year)

Recommendation #2: Government and forest sector representatives should consider jointly developing strategic plans to coordinate overall salvage effort and direction.

Action:

Establish/re-affirm steering committees for each management unit with the objective of defining (to the agreed extent possible) the strategic forest management direction. This could/should include such things as:

- harvest priority (strategy for pine liquidation)
- harvest profile
- areas/profile for new opportunities

- preferred silviculture regimes
- development timing
- monitoring/tracking (assess implications on a management unit basis of current practice)

Timing: Spring/2008

Responsibility: Management unit level staff from industry, MOF and BCTS/Regional roll-up

Estimated cost: Existing staff and resources on strategy committees will define strategic planning needs and propose specific projects (e.g. modeling scenarios).

Recommendation #3: Government and industry must work together to ensure optimum utilization of existing milling capacity before encouraging development of additional capacity. This includes ensuring wood planned for the market gets to the market and ensuring ongoing monitoring of the supply/demand balance.

Action:

In consultation with industry, government must monitor the mill capacity/supply balance on a continuous basis. New timber sale opportunities must recognize the existing capacity objective while maintaining the key elements of the timber pricing model. A consultation protocol should be established at the provincial/regional and management unit levels. Government must ensure adequate compliance and enforcement to make a continuous supply of fiber available to the market.

Responsibility: Government and BCTS

Recommendations 4, 5, and 6: Government and industry should develop an incentive program to ensure maximum recovery of damaged fiber. Incentive programs should be developed to encourage the salvage/reforestation of marginal stands. Government and industry should explore existing practices and remove any disincentives. (This includes having a “fresh” look at “point of appraisal”).

This issue will intensify as the high value stands are liquidated and the AAC can only be achieved by operating in marginal timber. Needless to say, the issue is market driven both in terms of product and price. Much work has been done on this topic and it is recognized as being extremely sensitive.

Action:

Industry (in consultation with government) must define parameters to identify non-commercial stands where incentives may be appropriate.

A government (provincial and federal)/forest sector task force should be established and charged with investigating all policy aspects of this issue.

Responsibility: Industry must define the problem at the local level (not a priority until higher value stands are depleted). Government (with full consultation) must seek solutions at the federal and provincial levels.

Timing: Spring/summer/2008

Although the issue is not urgent the time required to find a solution to an inevitable problem may be lengthy. This topic should be given a higher profile within the next year.

Recommendation 7: The tenure system should be re-examined to ensure it is achieving desired results.

Action:

CCBAC should encourage government to prepare a discussion paper and engage in a public consultation process.

Responsibility: Government

Timing: Within the year (ASAP) – AAC increases are enabling new tenure opportunities and as the AAC declines in the future tenure focus will change.

Recommendation 8: Government and industry take the lead in strengthening efforts to coordinate, direct and communicate research efforts.

Action:

Strengthen research partnerships and clearly define roles, responsibilities and communication initiatives. Strengthen communication between researchers and resource planners/managers.

Responsibility: All parties involved in research and communication of research results with the provincial government taking a leadership role.

Recommendation #9: Government and industry must cooperate to identify the nature and extent of potential opportunities.

Action:

Develop strategic plans (see recommendation #2) to prioritize and project future harvest of existing industry through time recognizing decreasing fiber recovery per hectare harvested as well as increased manufacturing by-product waste. In addition to quantifying the amount of unused fiber resulting from existing licenses it would be useful to model the physical characteristics of the fiber as it changes through time. A cooperative effort is required to identify stands of timber (fiber) surplus to existing requirements.

Responsibility: Government, BCTS and industry at the regional and management unit levels.

Timing: Immediate (2007/2008) and ongoing

Estimated Budget: \$75,000

Recommendation #10: Communication protocols between government agencies and various sub sectors must be strengthened.

Action:

Management unit steering committees (see recommendation #2) should develop protocols on effective communication.

Responsibility: Forest sector representatives, MOF, and BCTS

Timing: ASAP

Recommendation #11: Line agencies responsible for the development of strategies should consult with other CCLUP participants and examine the current strategies and if necessary plot an alternate approach.

Action:

The Inter-agency manager's committee and the Regional Resource Committee should sponsor/direct a strategy review with specific reporting requirements. Participation by "outside" experts should be encouraged.

Responsibility: Regional

Timing: early/2008

Estimated cost: \$5,000 (possible stakeholder presentation)

Recommendation #12: Government and industry should strategically examine (for timber purposes) the forest characteristics present practices will yield, analyze opportunities and agree on a future course of action.

Action:

Hire a consultant to interview license holders (and BCTS) and review existing practices and report on status quo predicted forests. Government and industry should review the report and confirm or re-define best practices at both the stand and landscape levels.

Responsibility: Regional/local – may lead to provincial level discussion.

Timing: Early/2008

Estimated Budget: \$20,000

Recommendation #13: Government and industry must work with communities and the public to develop strategic fire protection plans.

Action: ongoing. CCBAC should communicate/coordinate with MOF

Responsibility: Community/Regional District with support from MOF.

Timing: immediate and ongoing

Estimated Budget: Cost sharing between community, regional district and Union of BC Municipalities.