
*Central Cariboo Region
Timber Harvesting & Processing Employment Survey*

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Presented to:

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Acknowledgements and Disclaimer

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Forest licensees and contractors throughout the Central Cariboo region contributed employment and harvest data to this study. We would like to express our sincere thanks to all the companies and their employees for their time and effort in completing the questionnaires, during a very difficult period for the industry. Without their help, this work would not have been possible.

In developing the industry employment estimates in this study, the consultants have made several assumptions and utilized information gathered under the time and resource constraints imposed on this study. The assumptions and information are thought to be reasonable and suitable for the purposes of this analysis, but should not be relied upon for purposes other than conducting general socio-economic impact assessments.

About the Consultants

Pierce Lefebvre Consulting specializes in providing economic and management consulting services to its private and public sector clients. The company was formed in 1994 when Sylvie Lefebvre established the firm together with Claude Pierce, an economist who had been an independent consultant since 1990.

Sylvie Lefebvre is a professional economist and a Certified Management Consultant (CMC) with over 27 years of consulting experience, including 15 years as principal of *Pierce Lefebvre Consulting*, 10 years at Price Waterhouse (now PriceWaterhouseCoopers) and prior to that, 2 years with a smaller B.C. consulting firm that specialized in the mining industry. Sylvie specializes in socio-economic assessments, and much of her 27 years of experience working in BC has been focused on the forest sector. She has conducted many studies that have involved the development and use of timber harvesting and processing employment coefficients.

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Executive Summary

This report provides direct forest industry employment coefficients associated with harvesting and processing timber from the Central Cariboo Region of BC. The coefficients are based on a survey of forest licensees in the area and timber harvest data from the BC Ministry of Forests and Range (MOFR). Similar studies have been conducted for the Prince George TSA Region, various areas of Coastal BC and the Central Kootenay region.

For the purpose of this project, the Central Cariboo Region follows the same boundaries as the Williams Lake TSA (including the Western Supply Blocks), the Quesnel TSA and TFL 52. The study area therefore includes three Forest Districts (FD), namely the Central Cariboo FD, the Quesnel FD and the Chilcotin FD.

Summary of Findings

Survey data cover an annual timber harvest of 6.998 million m³ or an estimated 78.6% of the total harvest volume for the Central Cariboo region over the three years under study, namely 2006, 2007 and 2008. This is based on timber harvest data provided by the companies that participated in the survey and the total harvest for the Central Cariboo region as reported by MOFR.

Central Cariboo Region Study Results - 3 Year Average	Quesnel FD		Williams Lake TSA (CC & Chil FD)		3 Yr Average Total Region
	Total Harvest	Survey Results	Total Harvest	Survey Results	
Total Timber Harvest (m ³)	4,909,354	4,151,858	3,995,784	2,846,509	8,905,138
Survey Volume as a % of Total Harvest		84.6%		71.2%	78.6%
BC Direct Employment	PY of Employment	Employment Coefficients - PY per 1,000 m ³	PY of Employment	Employment Coefficients - PY per 1,000 m ³	PY of Employment - Total Region
Harvesting and Silviculture (3 year average from survey)					
Harvesting/ Falling	405	0.082	438	0.110	843
Planning & Administration	89	0.018	118	0.029	206
Log Hauling / Trucking	189	0.039	296	0.074	486
Road Building	39	0.008	21	0.005	60
Silviculture & Other	205	0.042	168	0.042	373
Sub-Total - Harvesting and Silviculture	927	0.189	1,041	0.261	1,968
Primary Processing per m³ of Timber Harvested in Central Cariboo region					
Wood Processing	1,738	0.354	1,243	0.311	2,982
Pulp and Paper	270	0.055	220	0.055	490
P & P Processing Outside CC Region per m³ of Timber Harvested in CC Region	74	0.015	60	0.015	134
Sub-Total - Primary Processing	2,082	0.424	1,522	0.381	3,605
Total Harvesting & Processing	3,008	0.613	2,563	0.642	5,573

Notes:

1. This table and others throughout this report provide estimates of direct harvesting employment based on MOFR timber harvest data and employment coefficients per m³ of timber harvest derived from the survey data. The number of significant digits presented in these estimates implies a degree of precision that does not exist but the represented precision is retained to maintain the integrity of the data and transparency of the methodology. Tables do not always add due to rounding.
2. Timber harvest estimates are based on MOFR Harvest Billing System data as well as survey data.
3. The timber harvesting and silviculture employment coefficients are from the survey data. The BC primary processing employment coefficients are estimated based on the MOFR data on mill capacity for 2006 and other data.
4. The employment data exclude MOFR employees, and other indirect and induced employment generated through forest industry and employee spending on goods and services.

The survey data show that timber harvesting generates 0.189 direct PY of harvesting and silviculture employment per 1,000 m³ of timber harvested in the Quesnel FD and 0.261 direct PY

of harvesting and silviculture employment per 1,000 m³ of timber harvested in the Williams Lake TSA. This translates to an estimated 1,968 PY of direct timber harvesting and silviculture employment when extrapolated to the entire timber harvest in the Central Cariboo Region.

In addition to timber harvesting and silviculture, the Central Cariboo region timber harvest generates an estimated 3,605 PY of direct wood processing and primary pulp and paper manufacturing employment (3,471 PY in the study area and 134 PY outside the study area), bringing the total direct employment impact to 5,573 PY of employment.

The following table provides an estimate of the direct employment impacts associated with the harvest within each Forest District, as well as the place of residence of timber harvesting and processing employees.

Direct Employment Impacts (PY) from Central Cariboo (CC) Region Timber Harvest (Extrapolated to Total Industry)	3 Year Average - Weighted Average Based on MOFR Harvest Data				
	Quesnel FD	Central Cariboo FD	Chilcotin FD	Total CC Region	% of Total
Direct Harvesting & Silviculture Employment by Employee Residence:					
Quesnel FD	656	82	0	738	38%
Central Cariboo FD	141	731	96	968	49%
Chilcotin FD	1	12	51	64	3%
Other BC Interior	13	0	2	15	1%
Lower Mainland and Other (mainly planting crews)	116	52	15	183	9%
Total Harvesting and Silviculture	927	877	164	1,968	100%
Processing Employment in CC Region:					
Primary Wood Products Processing in CC Region	1,738	1,078	166	2,982	
Primary Pulp and Paper in CC Region	270	185	35	490	
Sub-Total	2,008	1,263	201	3,471	
Primary Processing Outside Central Cariboo Region	74	50	10	134	
Total BC Direct Impacts	3,008	2,190	375	5,573	
TIMBER HARVEST					
Total Timber Harvest (MOFR) (m ³)	4,909,354	3,358,218	637,566	8,905,138	
% of Timber Harvest by Forest District	55%	38%	7%	100%	
Survey Coverage (Harvest Volume - m ³)	4,151,858	2,337,428	509,082	6,998,367	
Survey Volume Coverage (Reported Volume as a % of MOFR Total Harvest Volume)	85%	70%	80%	79%	

Source: Based on employment coefficients derived from the survey of licensees and other data, and the MOFR timber harvest by FD as reported by the MOFR Harvest Billing System.

The survey results on employment by residence location, and the direct employment impacts derived from the employment coefficients and MOFR harvest levels by FD show the following:

- 49% of the timber harvesting employees associated with the Central Cariboo region timber harvest reside in the Central Cariboo FD, while 38% of the regional timber harvest is in that FD;
- 38% reside in the Quesnel FD, compared to 55% of the harvest in that district;
- 3% reside in the Chilcotin FD (Chilcotin residents account for 31% of the timber harvest in that district, but another 59% reside in nearby Williams Lake with only 10% residing outside the region);
- 1% reside in neighbouring BC Interior regions; and
- the balance (9%) consists mainly of silviculture planting crews who reside in the Greater Vancouver region, elsewhere in BC and in other Canadian provinces.

1 Introduction

This report presents the results of a survey conducted to update forest industry employment coefficients for the Central Cariboo region. Similar surveys were conducted for Haida Gwaii/ Queen Charlotte Islands (HG/QCI) (2005), the Sea-to-Sky region (2006), the North and Central Coast (2006), parts of the BC Southern Interior (2008) and the Prince George TSA (2008).

The methodology for the work was as follows:

- collect data on timber harvesting employment and harvest by management unit through a survey of timber licensees and logging contractors that operate in the Central Cariboo region;
- collect Ministry of Forests and Range (MOFR) timber harvest data by management unit;
- estimate local direct harvesting employment coefficients per thousand m³ of wood harvested for each sub-region from the employment and harvest survey data (2006 through 2008 averages);
- estimate BC's primary wood and pulp and paper processing employment that results from the Central Cariboo timber harvest (based on BC MOFR Mill Capacity survey for 2006 and other data); and
- estimate the total direct employment impacts associated with the timber harvest from the Central Cariboo region based on the MOFR timber harvest data for the total region and the employment coefficients derived from the survey and other data.

This survey considers the direct employment associated with harvesting and processing timber from the Central Cariboo region. Harvesting and processing timber from the Central Cariboo region also generates employment through suppliers of goods and services to the forest industry (indirect employment) and through the re-spending effects of the direct and indirect employees (induced employment). Indirect and induced employment associated with the Central Cariboo harvest is not estimated as part of this survey. MOFR employment is also excluded.

The survey results represent a mix of data obtained from licensees and their contractors, often involving some extrapolation or interpolation of data. The study results represent the best information that could be obtained within the time and monetary budget of the project, and given the degree of cooperation of the licensees and their contractors with the survey process.

For the purpose of this project, the Central Cariboo Region follows the same boundaries as the Williams Lake TSA (including the Western Supply Blocks), the Quesnel TSA and TFL 52. The study area therefore includes three Forest Districts (FD), namely the Central Cariboo FD, the Quesnel FD and the Chilcotin FD. Based on data from MOFR, the Williams Lake TSA covers 4.87 million hectares of the BC Interior and the Quesnel FD covers another 1.83 million hectares, for a total of 6.7 million hectares, or approximately 7.1% of the BC landbase.

Chart 1 on the following page illustrates the boundaries of the Quesnel FD which includes the Quesnel TSA and TFL 52; the chart also shows TFL 5 which is now part of TFL 52. Chart 2 illustrates the boundaries of the Williams Lake TSA which includes the Chilcotin FD and the Central Cariboo FD.

Chart 1 *Boundaries of Quesnel Forest District*

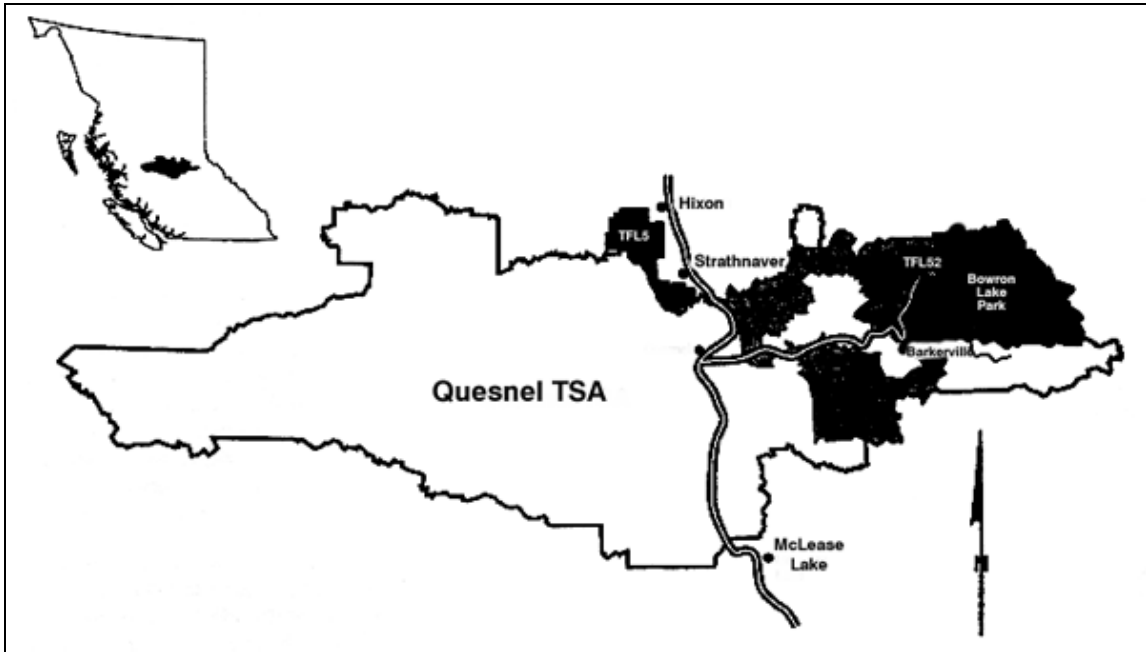
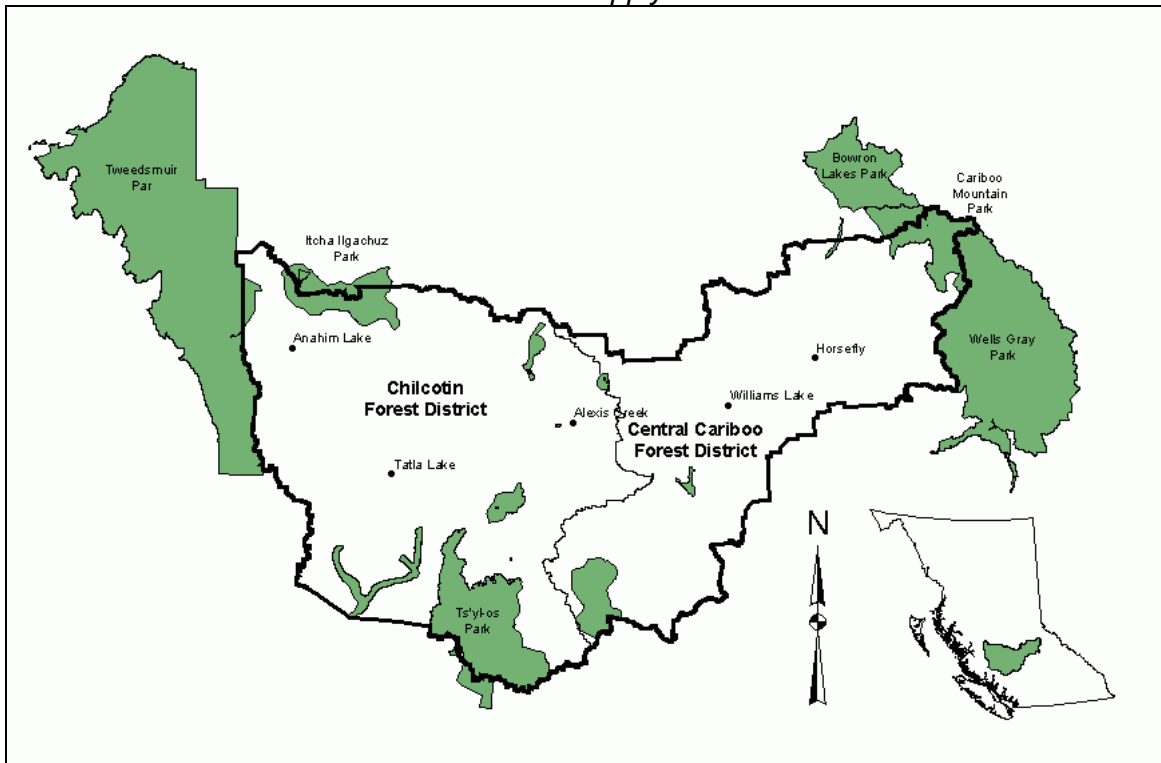


Chart 2 *Boundaries of Williams Lake Timber Supply Area*



Source: BC MOFR.

The following sections present key findings. The appendices to the report include detailed survey results by Forest District as well as a list of key references.

2 Survey Coverage and Timber Harvest Volumes

The consultants surveyed each forest licensee that is named in the Ministry of Forests and Range (MOFR) 2008 timber apportionment for the Quesnel Timber Supply Area (TSA) or/and the Williams Lake TSA. The consultants also surveyed a number of larger logging contractors.

There are three large licensees (each with licences greater than 500,000 m³ per annum) that are listed in the MOFR apportionment for the study area, namely Tolko Industries Ltd., West Fraser Mills Ltd. (West Fraser) and Canadian Forest Products (Canfor). Within the study area, Tolko Industries and West Fraser operate in each of the Quesnel, Central Cariboo and Chilcotin FD whereas Canfor operates only in the Quesnel FD. Ainsworth Lumber Co. Ltd is a fourth large licensee that operates in the Quesnel FD, but they only commenced harvesting in 2008 and their timber harvest for that year was minimal.

There are three medium size licensees that each hold licences for more than 200,000 m³ per annum when all three Forest Districts are combined. They are: Amabilis Contracting/ Pioneer Logging (and affiliated companies)¹, Sigurdson Brothers Logging Co. and C & C Wood Products Ltd. A fourth medium size licensee named in the MOFR apportionment, RPP Holdings Inc. holds a licence in the Quesnel FD with an annual AAC volume of 300,000 m³ but MOFR does not yet report any harvest on that licence.²

In addition, there are 17 other companies that are listed in the MOFR apportionment as holding timber licensees of more than 5,000 m³ in AAC volume, and have been actively harvesting in 2008. They are:

- 690361 BC Ltd.
- Billiboy Logging and Contracting
- Esketemc First Nation
- Klukus Management Holdings
- M & K Sawmills/ Nirmal Lidder
- Paradigm Logging Ltd.
- Tl'etinqox Logging Ltd.
- University of BC Research Forest
- Yun Ka Whut'en Holdings Ltd. / West Chilcotin Forest Products Ltd.
- Big 6 Contracting
- Borland Creek Logging
- Klatassine Resources Ltd.
- Linde Bros. Lumber Co.
- Red Bluff Development Corporation
- Tsi Del Del Enterprises Ltd.
- Xat'sull Logging Ltd.
- Ndazkhot'en Forest Management Ltd./ Nazko First Nation

The MOFR Harvest Billing System lists many other timber harvesting companies that are not listed in the current MOFR apportionment. These are often large logging contractors that harvest timber under BC Timber Sales as well as work under contract for the major licensees. They include companies such as Jordef Enterprises Limited, A.I. Contracting Ltd., Blackwater Timber Ltd., and AKAL Forest Products Ltd.

¹ Amabilis Contracting Ltd. also includes Chichelean Timber Co. Ltd., Avril Cherie Timber Company Inc., Kodiak Bear Timber Co. Ltd., and Maheca Timber Co. Ltd.

² Pioneer Family Timber Partnership and Pinnacle Pellet Inc. recently purchased the licence from Tall Oil Canada as part of plans to expand the Pinnacle Pellet Williams Lake pellet production facility and build a new wood pellet production facility adjacent to Dunkley Lumber Ltd. just north of the Quesnel FD. Source: www.pinnaclepellet.com/News-Releases.html; and "Pinnacle of Success", Logging and Sawmilling Journal, March 2009, www.forestnet.com/LS/issues/march_09/pinnacle.php.

Most forest licensees listed in the MOFR apportionment participated in the study. The difficult economic conditions for the forest sector in the first part of 2009 affected the ability of companies to participate in the survey on a timely basis, and the consultant experienced some delay in collecting the data. Staff reductions and industry shutdowns led to some of the licensees declining to participate in the survey or delaying the survey results until after spring break-up.

Where applicable, the licensees that participated in the survey completed separate questionnaires for each management unit so that data could be compiled by FD. Most of the medium-size and larger timber licensees, as well as a sample of their harvesting contractors, usually the larger contractors, participated in the survey and provided employment and harvest data. Almost all of the major licensees obtained and reported data from their contractors. For one of the major licensees, the consultant collected contractor employment data directly from a sample of major contractors and combined the contractor data with the licensee employment data. Approximately half of the major contractors contacted for the study provided detailed survey data.

Major logging contractors that obtain BCTS sales but are not specifically named in the MOFR timber apportionment were contacted to participate in the survey provided they harvested more than 5,000 m³ in 2008 (based on the MOFR Harvest Billing System data) and provided they could be identified and surveyed. Some of these companies are numbered companies or very small, and as a result, they are harder to identify and survey.

Since the main objective of the survey is to update forest industry employment coefficients expressed in terms of Person Years (PY) of employment per 1,000 m³ of timber harvested, it is not necessary to survey 100% of timber harvesting operations. Provided that harvesting employment data are collected for a reasonable proportion of the total harvest in the region, distributed across various licence types, one can be reasonably confident that the resulting employment coefficients are representative of the regional average. The survey results (and total regional harvest) are weighted towards the larger licensees and larger logging contractors, which may have more capital intensive and labour efficient operations than smaller licensees and contractors.

Survey data cover an estimated 78.6% of the total harvest volume over the three years under study, namely 2006, 2007 and 2008. This is based on timber harvest data by scale date provided by the companies that participated in the survey, as well as the harvest data reported in the MOFR Harvest Billing System for each of those three years.

Table 1 Estimated Survey Coverage

Survey Coverage - Central Cariboo Region (TSA and TFLs)	2006	2007	2008	3 Year Average
Quesnel FD				
Survey Data	3,661,118	4,190,720	4,603,735	4,151,858
MOFR Data - Total Harvest	4,603,037	4,784,078	5,340,947	4,909,354
Survey Volume Coverage	79.5%	87.6%	86.2%	84.6%
Central Cariboo FD				
Survey Data	2,705,428	2,124,927	2,181,928	2,337,428
MOFR Data - Total Harvest	4,076,641	3,126,935	2,871,077	3,358,218
Survey Volume Coverage	66.4%	68.0%	76.0%	69.6%
Chilcotin FD				
Survey Data	334,362	673,025	519,858	509,082
MOFR Data - Total Harvest	375,713	897,136	639,850	637,566
Survey Volume Coverage	89.0%	75.0%	81.2%	79.8%
Total Region				
Survey Data	6,700,908	6,988,672	7,305,521	6,998,367
MOFR Data - Total Harvest	9,055,391	8,808,149	8,851,874	8,905,138
Survey Volume Coverage	74.0%	79.3%	82.5%	78.6%

Notes:

1. The survey data include the timber harvest reported by licensees and their contractors and represents data by scale date for each calendar year.
2. The estimated total harvest by sub-region is based on data provided by the Ministry of Forests and Range (MOFR) Harvest Billing System (provided by Mark Messmer of BC MOFR, March 27, 2009). The MOFR HBS harvest data are by scale date.

As indicated on the BC MOFR website, the current Allowable Annual Cut (AAC) is 5.280 million m³ for the Quesnel TSA and 5.663 million m³ for the Williams Lake TSA, or 10.94 million m³ for the two TSAs.³

The AAC for the Quesnel TSA and Williams Lake TSA have almost doubled in the last decade in order to provide each region with sufficient AAC to salvage timber killed by the then current and projected MPB epidemic⁴:

- The AAC for the Quesnel TSA was increased by 1 million m³ in July 2001 and by 2 million m³ in September 2004 to the current level of about 5.3 million m³.
- The AAC for the Williams Lake TSA was increased in 2007 by 2 million m³ to the current level of about 5.8 million m³.
- When the two are combined, the AAC increased from approximately 5.9 million m³ in the year 2000 to the 10.9 million m³ currently in effect for the two TSAs.

The 2008 AAC for Tree Farm Licence (TFL) #52 in the Quesnel FD adds 870,000 m³, which brings the total AAC for the region to 11.813 million m³ (excluding 440,000 m³ in non-AAC volume in the Chilcotin FD). In March 2009, the AAC for TFL 52 was increased to one million cubic metres to help address the mountain pine beetle epidemic.⁵

The following table summarizes the licensed volumes that comprise the AAC for the Quesnel FD and

³ Source: BC MOFR website, <http://www.for.gov.bc.ca/hth/apportionment/tsas.htm>.

⁴ Source: BC MOF, "Cut Level Increased in Response to Beetle Epidemic", News Release, September 14, 2004; BC MOFR, "Williams Lake Harvest Increased in Response to Beetle", News Release, April 18, 2007; and BC MOF Forest Analysis Branch, *Expedited Timber Supply Review for the Lakes, Prince George and Quesnel Timber Supply Areas, Public Discussion Paper*, June 2004, page 5. All are available on the BC MOFR website: www.for.gov.bc.ca.

⁵ Source: BC MOFR, "Allowable Annual Cut Increased for Tree Farm Licence 52", News Release, March 31, 2009.

Williams Lake TSA licences. The licences within the Williams Lake TSA have been allocated either in whole or in part to the Central Cariboo FD or the Chilcotin FD, based on discussions with MOFR staff, the timber harvesting data from the MOFR Harvest Billing System, and the study results.

Table 2 Central Cariboo Region Licensed Timber Volumes

Central Cariboo Region (Quesnel FD, Central Cariboo FD and Chilcotin FD)					
Forest District/ Type of Licence	Detail / Comments	2008 Allowable Annual Cut (AAC) Volume (m3)			2008 Non-AAC Volume (m3)
		Conventional	Mountain Pine Beetle/ Problem Forest Types	Total AAC	
Quesnel FD					
Quesnel TSA Forest Licences	Includes all TSA Forest Licences listed in apportionment, as of November 10th, 2008	4,333,148	268,000	4,601,148	
Other Quesnel TSA Commitments	Includes BCTS sales not included in above commitments, community forest licences, woodlot licences and Forest Service Reserve	476,852	202,000	678,852	
Sub-Total - Quesnel TSA		4,810,000	470,000	5,280,000	
Tree Farm Licence (TFL) 52	Includes licences held by West Fraser Mills and BC Timber Sales (BCTS) as of November 10th, 2008	870,000		870,000	
Total Quesnel FD		5,680,000	470,000	6,150,000	
Williams Lake TSA					
Central Cariboo FD:					
CCFD - TSA Forest Licences	Allocated by Forest District (FD) based on MOFR timber harvest and/or study results	2,327,000		2,327,000	
CCFD - Other Commitments		2,566,578		2,566,578	
Total Central Cariboo FD		4,893,578		4,893,578	
Chilcotin FD:					
Chilcotin FD - TSA Forest Licences	Allocated by Forest District (FD) based on MOFR timber harvest and/or study results	247,098	310,000	557,098	440,000
Chilcotin FD - Other Commitments		72,324	140,000	212,324	
Total Chilcotin FD		319,422	450,000	769,422	
Apportionment for Williams Lake TSA	MOFR - Apportionment System - TSA AAC, Apportionment and Commitments, Williams Lake TSA, as of November 10th, 2008.	5,213,000	450,000	5,663,000	440,000
Total AAC - TSA Licences and TFLs for Central Cariboo Region		10,893,000	920,000	11,813,000	440,000

Note: The AAC for the Williams Lake TSA excludes a pulpwood agreement for 107,000 m3 of deciduous trees.

Source: BC MOFR Apportionment System – TSA AAC, Apportionment and Commitments, Quesnel TSA and Williams Lake TSA, as of November 10th, 2008. Appendices 1, 2 and 3 provide detail on individual licences by sub-region.

Tolko Industries Ltd., West Fraser Mills Ltd. and Canadian Forest Products (Canfor) hold timber licences that together account for 45% of the AAC for the region. Three other larger licensees or affiliated groups of licensees, account for another 8% of timber licences. They are: Amabilis Contracting Ltd./ Pioneer Logging and other affiliated companies, C & C Wood Products and Sigurdson Brothers Logging Company. Other licensees account for the balance of timber licences (47% of total AAC). This includes some large licences resulting from the pine beetle uplift for which little or no timber harvesting has occurred to date.

Table 3 AAC and Timber Harvest Volumes in Central Cariboo Region

Share of Timber Harvest and AAC by Forest District	Timber Harvest from MOFR Billing System		Timber Licences (AAC)	
	3 Year Average	% of Total by FD	AAC	AAC as a % of Total
Quesnel Forest District				
Tolko Industries, West Fraser Mills & Canfor	3,401,061	69%	3,357,765	55%
Other Larger Licensees	347,756	7%	595,000	10%
Other Medium Size & Smaller Licensees	<u>1,160,537</u>	<u>24%</u>	<u>2,197,235</u>	<u>36%</u>
Total	4,909,354	100%	6,150,000	100%
Central Cariboo Forest District				
Tolko Industries & West Fraser Mills	2,112,595	63%	1,777,190	36%
Other Larger Licensees	228,388	7%	300,000	6%
Other Medium Size & Smaller Licensees	<u>1,017,235</u>	<u>30%</u>	<u>2,816,388</u>	<u>58%</u>
Total	3,358,218	100%	4,893,578	100%
Chilcotin Forest District				
Tolko Industries & West Fraser Mills	364,277	57%	150,000	19%
Other Larger Licensees	62,708	10%	80,000	10%
Other Medium Size & Smaller Licensees	<u>210,581</u>	<u>33%</u>	<u>539,422</u>	<u>70%</u>
Total	637,566	100%	769,422	100%
Total - Central Cariboo Region				
Tolko Industries, West Fraser Mills & Canfor	5,877,933	66%	5,284,955	45%
Other Larger Licensees	638,851	7%	975,000	8%
Other Medium Size & Smaller Licensees	<u>2,388,353</u>	<u>27%</u>	<u>5,553,045</u>	<u>47%</u>
Total	8,905,138	100%	11,813,000	100%

Notes:

1. Other larger licensees include Amabilis Contracting Ltd./ Pioneer Logging and other affiliated companies, C & C Wood Products and Sigurdson Brothers Logging Company.
2. Other medium size & smaller licensees also include two larger licensees for which little or no harvesting was carried out as of 2008, namely Ainsworth Lumber Co. Ltd. (combined AAC of 720,000 m3 in Quesnel FD) and RPP Holdings Inc. (300,000 m3 licence in Quesnel FD).
3. The AAC for the Williams Lake TSA excludes a pulpwood agreement for 107,000 m3 of deciduous trees.

Source:

BC MOFR Apportionment System – TSA AAC, Apportionment and Commitments, Quesnel TSA and Williams Lake TSA, as of November 10th, 2009. Appendices 1, 2 and 3 provide detail on individual licences by sub-region.

Table 3 also shows the timber harvest volumes by FD as reported by the MOFR Harvest Billing System (HBS) and the share of timber harvested in each FD by the larger licensees. As shown on the table, some 8.9 million m3 of timber was harvested on average in the last 3 years, namely 2006, 2007 and 2008. Tolko Industries, West Fraser and Canfor harvested an average of two thirds of the timber harvested in the Cariboo region in those three years.

Three other larger licensees or groups of affiliated licensees harvested 7% of the region's timber harvest, and other medium size and smaller licensees harvested the balance or 27% of the timber volume. Excluding the licensees listed above, in 2008 there were approximately 35 companies/ individuals that harvested more than 5,000 m3 of timber. Approximately half of these companies are listed in the MOFR apportionment while the other half held only licences made available through BC Timber Sales.

The MOFR timber apportionment and information on individual licences for the Central Cariboo region by Forest District is provided in Appendices 1, 2 and 3.

3 Destination of Central Cariboo Timber Harvest

The timber harvest from the Central Cariboo region is directed primarily to supplying the large manufacturing facilities in the Central Cariboo region. The vast majority of timber harvested within each of the three FDs is processed within the Central Cariboo region. When survey data for the entire region are taken into account, 52% of the timber harvested is processed in the Quesnel FD, 41% is processed in the Central Cariboo FD, 1% is processed in the Chilcotin FD, and the balance, or 6% is processed in neighbouring Forest Districts. None of the survey participants reported any timber volumes exported outside the country.

Table 4 Survey Results on Destination of Timber Harvest from Central Cariboo Region

Central Cariboo Region Survey Results Destination of Timber Harvest	3 Year Average			
	Quesnel FD	Central Cariboo FD	Chilcotin FD	Total Region
Total Reported Harvested Volumes (m3) - Based on Survey Results	4,151,858	2,337,428	509,082	6,998,367
Harvest Volume in Each Region as a % of Total Region - Based on Survey Results	59.3%	33.4%	7.3%	100.0%
Survey Volume Coverage (Reported Volume as a % of MOFR Total Harvest Volume)	84.6%	69.6%	79.8%	78.6%
Destination of Timber Harvest as a Percent of Total Volumes Harvested:				
Export Volume	0.0%	0.0%	0.0%	0.0%
Quesnel FD	95.4%	0.5%	0.1%	51.6%
Central Cariboo FD	0.3%	89.5%	92.2%	41.8%
Chilcotin FD	0.0%	0.0%	7.6%	1.0%
Prince George TSA	4.3%	9.2%	0.0%	5.3%
Kamloops Forest District	0.0%	0.3%	0.0%	0.1%
Lillooet - Cascades FD	0.0%	0.1%	0.0%	0.0%
100 Mile House	<u>0.0%</u>	<u>0.5%</u>	<u>0.1%</u>	<u>0.2%</u>
TOTAL VOLUME	100.0%	100.0%	100.0%	100.0%

Note: Destination of timber harvest is from survey results, which cover 78.6% of the Central Cariboo region timber harvest as reported by MOFR.

4 Timber Harvesting and Processing Employment Coefficients

The survey requested data on timber harvesting employment and timber harvest volumes by management unit and Forest District. In this section of the report, the survey employment data and timber harvest volumes are used to derive the harvesting and silviculture employment coefficients (PY of employment divided by m3 of reported timber harvest). This section also provides estimates of employment coefficients associated with timber processing, namely primary wood products and primary pulp and paper manufacturing.

In the next section of the report, the coefficients are applied to the entire regional timber harvest (as indicated by the MOFR Harvest Billing System), to derive an estimate of total direct employment impacts associated with the Central Cariboo region timber harvest.

4.1 Timber Harvesting and Silviculture Employment Coefficients

Table 5 on the following page summarizes the estimated timber harvesting and silviculture employment coefficients per 1,000 m³ of timber harvested, as derived from the survey data.

There are many factors that influence timber harvesting employment coefficients over time, in any particular year, or for any particular operation.

- The timing of the harvest within the planning cycle is a key factor affecting employment coefficients. For example, a small licensee might conduct all of the harvest planning in one year and the actual harvesting in another. Using three-year averages likely alleviates some of these timing differences, but does not likely eliminate them completely.
- Most silviculture employment related to a specific timber harvest typically occurs one or two years after the timber has been harvested. The silviculture employment coefficients estimated as part of this study may not fully reflect changes in timber harvest levels resulting from the MPB infestation and changes in market conditions. The survey participants reported silviculture contractor employment that occurred in 2006, 2007 and 2008, work which may have been associated with the timber harvest of previous years.
- In some FD, the percentage of timber that is harvested through conventional methods vs. cable logging or helicopter logging affects the types of timber harvesting jobs, and may affect the number of jobs involved. The survey data show that of the total timber harvested in the Central Cariboo region, virtually all of it is harvested through conventional ground logging methods with negligible amounts harvested through cable logging and none harvested by helicopter. As part of a similar study conducted for the Prince George TSA, one major licensee in that region reported that cable logging is approximately 25% more labour intensive than conventional logging. Timber harvesting employment coefficients for the Central Cariboo region are based almost entirely on conventional ground logging activity.
- Stands with a higher degree of pine beetle infestation are likely to have lower yields per hectare than green stands, but may require similar employment levels. If this is the case, as yield per hectare drops, harvesting employment coefficients expressed in PY per 1,000 m³ are likely to increase. The survey participants were asked to report on the degree of beetle infestation in their timber harvest for 2008. The survey participants reported that on average, 91% of their harvest consisted of pine leading stands and virtually all pine leading stands are beetle infested. Almost all MPB infested wood that is harvested is dead wood but remains usable for solid wood products. In 2008, the percentage of pine leading stands harvested was reported to be the highest in the Chilcotin FD.

Table 5 and others throughout this report, provide estimates of direct employment coefficients per m³ of timber harvest derived from the survey and other data. The number of significant digits presented in these estimates implies a degree of precision that does not exist but the represented precision is retained to maintain the integrity of the data and transparency of the methodology.

Table 5 Direct Timber Harvesting Employment Coefficients for Central Cariboo Region

Central Cariboo Region Survey Results Person Years (PY) of Direct Harvesting Related Employment per 1,000 m3 of Timber Harvested	3 Year Average - Person Years (PY) per 1,000 m3				
	Quesnel FD	Central Cariboo FD	Chilcotin FD	Total Region	% of Total
Harvesting/ Falling	0.082	0.110	0.107	0.094	43%
Planning & Administration	0.018	0.030	0.025	0.023	10%
Log Hauling / Trucking	0.039	0.074	0.075	0.053	24%
Barging / Towing	0.000	0.000	0.000	0.000	0%
Road Building	0.008	0.004	0.010	0.007	3%
Silviculture	0.041	0.042	0.040	0.041	19%
Other	0.001	0.000	0.000	0.001	0%
Total	0.189	0.261	0.257	0.218	100%
Direct Employment by Employee Residence:					
Quesnel FD	0.134	0.024	0.000	0.084	39%
Central Cariboo FD	0.029	0.218	0.151	0.104	48%
Chilcotin FD	0.000	0.004	0.080	0.007	3%
Other BC Interior	0.003	0.000	0.003	0.002	1%
Lower Mainland and Other (mainly planting crews)	0.024	0.015	0.024	0.021	9%
Total	0.189	0.261	0.257	0.218	100.0%

Notes:

1. The harvesting coefficients are derived from the survey of licensees operating in the Central Cariboo region and are based on the timber harvest reported by survey participants (Table 2) and the associated survey results on PY of employment (Appendices 1 to 4).
2. Timber harvesting employment includes logging, silviculture and road building operations that are directly linked to logging.

Table 5 shows that the direct harvesting employment coefficient appears lower in the Quesnel FD than in the Central Cariboo and Chilcotin FD, mainly due to a lower log hauling & trucking employment coefficient in the Quesnel FD relative to that of the Central Cariboo FD (i.e. 0.039 PY per 1,000 m3 of timber harvested for the Quesnel FD compared to 0.074 PY per 1,000 m3 for the Central Cariboo FD and 0.075 PY per 1,000 m3 for the Chilcotin FD).

Table 5 also shows the direct timber harvesting employment per 1,000 m3 by location of employee residence. This information is calculated using the employment coefficients per 1,000 m3 of timber harvested and the survey results regarding where timber harvesting employees reside. The survey results show:

- 48% of the harvesting employees associated with the timber harvested by survey participants reside in the Central Cariboo FD;
- 39% reside in the Quesnel FD;
- 3% reside in the Chilcotin FD;
- 1% reside in other BC Interior regions including Prince George, 100 Mile House and Kamloops; and
- the balance, or 9% reside elsewhere in BC or other Canadian provinces mainly the result of planting crews coming into the region for a few weeks at a time.

The survey results on direct regional employment by employee residence represent an average which is weighted by the timber harvest in each FD reported by the survey participants. Slightly different results arise when the coefficients by FD are applied to the entire MOFR timber harvest.

Data on the proportion of the timber harvesting and processing workforce by community and by FD are shown in the survey results presented in the appendices.

4.2 Timber Processing Employment Coefficients

MOFR conducts an annual survey of mill capacity for all wood products and pulp and paper processing operations in BC.⁶ In 2006, MOFR reported 26 mills operating in the Central Cariboo region. These include:

- 12 major sawmills;
- two plywood/veneer plants, one in Quesnel and one in Williams Lake;
- one MDF plant in Quesnel;
- 2 pulp mills in Quesnel;
- 2 pellet manufacturing operations, one in Quesnel and one in Williams Lake, and
- 7 other mills including 3 small lumber mills, 3 log home operations, and 1 chip mill. A list of the operations is included in Appendix 5.

In 2008, these 26 manufacturing operations in the Central Cariboo region employed an estimated 3,730 people, including 3,240 people in wood products manufacturing and 490 people in pulp and paper operations.⁷ This section of the report combines MOFR data on these operations with other data to derive estimates of employment coefficients expressed in terms of Person Years (PY) of employment per 1,000 m³ of fibre input, and timber harvested.

As shown on Table 6 on the following page, manufacturing operations in the Central Cariboo region processed 9.18 million m³ of timber in 2006, or approximately 3% more than the 8.9 million m³ average timber harvest in the region in the last 3 years. Table 6 also shows the methodology for deriving the estimated primary processing employment coefficients for 2008.

The employment estimates in Table 6 represent a 3 year average, and are based on the timber harvest and the mills that were in operation in 2008.

In 2009, the timber harvest in the Central Cariboo region is expected to fall, in response to market conditions and the temporary and/or permanent closures of various milling operations:⁸

- In February 2009, Tolko Industries closed its milling operations in the Central Cariboo region for an indefinite time, thereby affecting some 600 employees in Williams Lake (3 sawmills and a chipping operation) and 165 employees in Quesnel (one sawmill). In April 2009, the Lakeview mill in Williams Lake re-opened and approximately 200 employees returned to work, but the other mills remained closed.
- Shift reductions and downtime are becoming more common at all mills in the Central Cariboo region including West Fraser, Canfor, West Chilcotin Forest Products and Sigurdson Bros. Logging Ltd.

It is unclear what impacts these temporary mill closures would have on the employment coefficients

⁶ BC Ministry of Forests and Range, *Major Primary Timber Processing Facilities in BC 2006*, August 2008.

⁷ Based on MOFR and other data including discussions with licensees contacted as part of the survey.

⁸ Source: Various news articles and publications including: BC MOFR, *Major Primary Timber Processing Facilities in BC 2006*, August 2008.

expressed in terms of PY per 1,000 m3 of timber harvest given that at least for some of the mills, the closure of the manufacturing operations are resulting in a corresponding reduction in timber harvest operations. For example, logging contractors for some of the mills that have shutdown in 2009, notably some contractors for Tolko Industries, reported a complete shutdown of their logging operations in February 2009, several weeks before spring break-up.

Table 6 Timber Processing Employment Coefficients for the Central Cariboo Region

Estimated Processing Employment Coefficients for Central Cariboo Region Timber Harvest (PY per 1,000 m3)	Quesnel FD	Central Cariboo FD	Chilcotin FD	Sub-Total - Williams Lake TSA	Total Region	Units
MOFR Timber Harvest Volume (000 m3) (note 1)	4,909	3,358	638	3,996	8,905.1	000 m3
Lumber and Other Wood Manufacturing:						
Wood Products Manufacturing Fibre Input - 000 m3 of Log Inputs	4,151	4,145	890	5,035	9,185.9	000 m3
Employment in Wood Manufacturing (PYs of Direct Employment)	1,470	1,332	234	1,566	3,036.0	PYs
Wood Products Manufacturing Coefficient - PY per 1,000 m3 Processed into Lumber & Other Wood Products	0.354	0.321	0.26	0.311	0.331	PYs per 000 m3 of Log Input
Estimated Chip Production from Local Mills (000 m3)	1,725			1,753	3,478.2	000 m3 of log inputs
Impacts from Pulp & Paper Processing						
Approximate PYs of Direct Employment at Quesnel Pulp Mills (Cariboo Pulp & Quesnel River Pulp)					490	PY
Estimated Fibre Input at Quesnel Pulp Mills (000 m3) (see Note 3)					2,750	000 m3
Estimated Volume of Chips Manufactured in Cariboo Region but Used at other Mills					728	000 m3
Pulp Coefficient for Quesnel Pulp Mills					0.055	PY per 000 m3 harvested
Estimated Job Impact at Other Pulp & Paper Mills in BC Interior					0.015	PY per 000 m3 harvested
Total Pulp and Paper Coefficient per 000 m3 Harvested					0.070	PY per 000 m3 harvested
Total Primary Processing Coefficient per 000 m3 Harvested (Wood Processing & P&P)					0.400	PY per 000 m3 harvested

Notes: May not add due to rounding.

1. The 3-year average harvest is based on the MOFR Harvest Billing System (provided by Mark Messmer of BC MOFR (March 27th, 2009).
2. Employment at the wood manufacturing and pulp & paper mills, as well as fibre input and mill capacity data are based on the MOFR report titled *Major Primary Timber Processing Facilities in BC, 2006*, as well as other data. Appendix 5 provides the list of manufacturing facilities in the Central Cariboo region, which were considered in estimating employment and other data from manufacturing operations.
3. It is assumed that the excess of chips produced at manufacturing operations in the Cariboo region are processed at similar pulp facilities outside the region, for example, in Prince George.

4.3 Comparisons with 1996 and 2001 Estimates of Employment Coefficients

The following table compares the 2008 employment coefficients for the Central Cariboo region derived by this study, with the employment coefficients used by MOFR as part of the socio-economic assessments conducted for the MOFR Timber Supply Reviews (TSR). This includes TSR-1 conducted in the mid-1990s and TSR-2 conducted in 2001.

In 2007, MOFR reviewed the AAC for the Williams Lake TSA but the socio-economic component of the AAC review reported employment coefficients that were based on 1998-2000 average employment coefficients developed for the 2001 report. These employment coefficients have also been quoted in various other socio-economic analyses including the Forest Strategy developed by the Cariboo-Chilcotin Beetle Action Coalition in 2007.⁹

⁹ Cariboo-Chilcotin Beetle Action Coalition (Mike Carlson, contractor), *Forest Sector Strategy*, November 2007, page 21.

Table 7 shows that the 2008 timber harvesting and processing employment coefficients that were estimated from the survey results and other data are lower than the TSR-2 estimates. When all direct impacts in BC are taken into account, the employment coefficients are 14% lower for the Quesnel FD and 21% lower for the Williams Lake TSA.

Table 7 Timber Harvesting & Processing Employment Coefficients, 1995, 2001 and 2008

Direct Employment Coefficients for Timber Harvested in Central Cariboo Region	Quesnel Forest District - PYs per 1,000 m3			Williams Lake TSA - PYs per 1,000 m3		
	TSR - 1 (1995)	TSR - 2 (2001)	2008 Results	TSR - 1 (1995)	TSR - 2 (2001)	2008 Results
Direct Impacts Within Cariboo Region:						
Harvesting (note 1)	0.20	0.15	0.1481	0.200	0.220	0.219
Silviculture (note 1)	0.03	0.02	0.0171	0.030	0.030	0.025
Wood Products Processing in Central Cariboo Region (Note 2)	0.52	0.48	0.3540	0.370	0.390	0.311
Total (Harvesting, Silviculture & Processing) in Central Cariboo Region	0.75	0.65	0.5192	0.600	0.640	0.555
Primary Pulp and Paper	0.11	included above	0.0550	0.170	0.150	0.055
Total (Harvesting, Silviculture & Processing) in Central Cariboo Region	0.860	0.65	0.5742	0.770	0.790	0.610
Additional Direct Impacts Outside Central Cariboo Region						
Harvesting (Other BC Interior)		0.020	0.000			
Silviculture (Lower Mainland and other)	0.040	0.010	0.024	0.040	0.020	0.017
Other Primary Processing in BC Interior	0.010	0.040	0.015			0.015
Sub-Total - Direct Impacts Outside Central Cariboo Region	0.050	0.070	0.039	0.040	0.020	0.032
Total Direct Impacts in BC:						
Harvesting (note 1)	0.200	0.170	0.148	0.200	0.220	0.219
Silviculture (note 1)	0.070	0.030	0.041	0.070	0.050	0.041
Wood Processing	0.530	---	0.354	0.370	0.390	0.311
P & P Processing	0.110	---	0.070	0.170	0.150	0.070
Sub-Total - Primary Processing	0.640	0.520	0.424	0.540	0.540	0.381
Total Direct Impacts in BC	0.910	0.720	0.613	0.810	0.810	0.642

Notes to Table 7: Data may not add due to rounding.

1. The timber harvesting coefficient includes logging, road maintenance, and log hauling. The silviculture coefficient includes primarily basic silviculture.
2. The wood processing coefficients for the Williams Lake TSA in 1995 (TSR-1) included sawmills, plywood plants and remanufacturing operations. In subsequent years, remanufacturing operations are excluded.
3. The 2008 survey results are based not only on data from the TSA, but also from TFLs.
4. This table provides estimates of direct harvesting employment based on MOFR timber harvest data and employment coefficients per m3 of timber harvest derived from the survey data and other study results. The number of significant digits presented in these estimates implies a degree of precision that does not exist but the represented precision is retained to maintain the integrity of the data and transparency of the methodology.

Source:

BC MOFR, Williams Lake Timber Supply Area, Rationale for Allowable Annual Cut (AAC) Determination, Effective April 18, 2007, page 78.

BC MOF, Quesnel Timber Supply Area Socio-Economic Analysis, March 1995, page 64.

BC MOF, Williams Lake Timber Supply Area Socio-Economic Analysis, March 1995, page 79.

BC MOF, Quesnel Timber Supply Area Analysis Report and Information for Urgent Allowable Annual Cut (AAC) Increase, February 2001, page iv.

BC MOFR, Timber Supply Review 2, Coefficients (person-years per 1000 m3 harvested), per website:

http://www.for.gov.bc.ca/HET/tsr_sea/TSR2.xls

5 Direct Employment Associated with Total Area Harvest

This section of the report presents an estimate of the direct employment associated with the Central Cariboo region timber harvest by applying the timber harvesting and processing employment coefficients derived in Section 4 to the total MOFR reported timber harvest for the Central Cariboo region.

The industry employment data presented in Table 8 represent an estimate of total industry employment based on the survey derived employment coefficients, and the 3-year average harvest using MOFR Harvest Billing System data by scale date for 2006 through 2008. The table provides estimates of the direct employment impacts resulting from the total timber harvest for each FD, and as a result, the regional percentage of employees by area of residence is weighted by the timber harvest in each FD. These percentages are slightly different than the survey results, which are by definition weighted by the timber harvest reported by the survey participants.

The estimates of direct employment exclude the estimated employment that results from processing timber that is not harvested in the Central Cariboo region.

Table 8 *Estimated Direct Employment Associated with Central Cariboo Region Harvest*

Direct Employment Impacts (PY) from Cariboo Region Timber Harvest (Extrapolated to Total Industry)	3 Year Average - Weighted Average Based on MOFR Harvest Data				
	Quesnel FD	Central Cariboo FD	Chilcotin FD	Total Region	% of Total
Direct Harvesting & Silviculture Employment by Employee Residence:					
Quesnel FD	656	82	0	738	13%
Central Cariboo FD	141	731	96	968	17%
Chilcotin FD	1	12	51	64	1%
Other BC Interior	13	0	2	15	0%
Lower Mainland and Other (mainly planting crews)	116	52	15	183	3%
Total Harvesting and Silviculture	927	877	164	1,968	35%
Processing Employment in Central Cariboo Region:					
Primary Wood Products Processing in CC Region	1,738	1,078	166	2,982	54%
Primary Pulp and Paper in CC Region	270	185	35	490	9%
Sub-Total	2,008	1,263	201	3,471	62%
Primary Processing Outside Central Cariboo Region	74	50	10	134	2%
Total BC Direct Impacts	3,008	2,190	375	5,573	100%
ASSUMPTIONS					
Total Timber Harvest (MOFR) (m3)	4,909,354	3,358,218	637,566	8,905,138	
Exports Based on Survey	0.0%	0.0%	0.0%	0.0%	
Volume Processed in BC (m3)	4,909,354	3,358,218	637,566	8,905,138	
	3 Year Average - Weighted Average Based on Survey Harvest Data				
BC Employment Coefficients (PY per 1,000 m3):					
Harvesting and Silviculture (3 Year Average from Survey)	0.189	0.261	0.257	0.218	35%
Primary Wood Products Processing in CC Region	0.354	0.321	0.260	0.331	53%
Primary Pulp and Paper in CC Region	0.055	0.055	0.055	0.055	9%
Primary Processing Outside CC Region	0.015	0.015	0.015	0.015	2%
Total - Direct Primary Impacts	0.613	0.652	0.587	0.619	100%

Notes to Table 8:

1. This table provides estimates of direct harvesting employment based on assumed levels of timber harvest and employment coefficients per m³ of timber harvest; the number of significant digits presented in these estimates implies a degree of precision that does not exist but the represented precision is retained to maintain the integrity of the data and transparency of the methodology.
 2. The data assume a job is full-time (one PY) if the work year consistently lasts 8 to 12 months per year, or at least 180 days per year. Part-time employment data were collected and converted to PY of employment using 180 days per PY.
 3. Excludes secondary paper manufacturing and value added wood processing sector.
- Source: based on study results on employment coefficients (see Tables 6 and 7 for more detail), and MOFR timber harvest for each Forest District.

6 Full-Time and Part-Time Employment

The survey of licensees requested data on the number of full-time jobs, the number of part-time jobs and the number of days per part-time job by category of timber harvesting employment. The following paragraphs explain how the survey differentiates between full-time and part-time employment, and discusses some of the factors that influence the number of jobs reported as part-time or full-time.

- The survey defines a full-time job (also referred to as Person Year (PY) of employment) as any job where employees worked more than 180 regular 8-hour days in a year.
- Where full-time contractor employees did not work 180 days, these were reported by licensees as part-time employment, and the number of days of part-time employment were converted into PY using 180 days per year.
- Full-time employees who also work on licences in other regions outside the Central Cariboo region were reported as part-time employees if they worked less than 180 days per year on the Central Cariboo region harvest.
- Special care was taken so that part-time workers who operate in different Forest Districts and management units for the same company were not counted more than once. Part-time workers who split their time between two licensees, however, could be counted two or more times. This may be particularly relevant for silviculture workers, and in particular planting crews, where part-time work is the most prevalent.
- While logging contractors such as “stump to dump” contractors were included in the survey, smaller contractors such as silviculture contractors were not. As a result, licensees typically estimated silviculture jobs, usually in terms of days of part-time employment. While licensees usually have employees or local contractors conduct the site preparation, brushing, and surveying, planting is typically carried out over a relatively short season by crews from all over BC and other Canadian provinces. Most large logging contractors did not report employment related to silviculture activities, and for that volume, silviculture employment was estimated based on other survey results.
- All the licensees who participated in the survey reported that their timber harvesting crews operate between 9 and 10 months per year. Spring break-up typically occurs during April and May, or sometimes up to the end of June. It is common to work 12-hour days during the winter months and survey participants were asked to adjust the number of days of employment to reflect 8-hour days (i.e. a 12-hour day was reported as 1.5 days). Many survey participants reported that operations shutdown in advance of spring break-up in 2009 as a result of poor market conditions.

The following table indicates the number of jobs associated with the PY of employment as reported in the survey. As shown on the table, on average, over the three-year period, there are an estimated 1.5 times more jobs than there are PY of employment. The table shows that on average every year, the Central Cariboo timber harvest generates 1,968 PY of direct harvesting employment in BC, but the number of full-time and part-time jobs may be as much as 1.5 times greater than that, at 2,866 jobs.

Table 9 Estimated Number of Jobs per PY of Direct Timber Harvesting Employment

Central Cariboo Region Full Time and Part Time Jobs Per PY of Direct Employment in Timber Harvesting and Silviculture	3 Year Average			
	Quesnel FD	Central Cariboo FD	Chilcotin FD	Total
Survey Results:				
Number of Full Time Jobs	692	521	117	1,330
Number of Part Time Jobs	372	447	72	891
Total Timber Harvesting Jobs	1,064	968	189	2,221
PY of Direct Timber Harvesting Employment	784	611	131	1,525
Jobs/PY of Direct Harvesting Employment	1.4	1.6	1.4	1.5
Extrapolated Data to Total Industry:				
PY of Direct Timber Harvesting Employment	927	877	164	1,968
Total Full Time & Part Time Jobs	1,258	1,391	236	2,866

Notes:

- As noted in the text of the report, there are various factors that influence the number of jobs reported as part-time or full-time. As a result, the data by FD are not as reliable as the combined totals, as each FD had fewer survey respondents.
- The industry estimates of full-time and part-time jobs are based on the survey results for the Central Cariboo region.

7 Factors Affecting Timber Harvesting Employment Coefficients

The survey requested information on possible factors that may be affecting timber harvesting employment coefficients, for example tree species, logging methods, proportion of old growth and proportion in mountainous/ Mountain Caribou habitat areas. The survey also requested licensees to comment on incremental silviculture activities. The following paragraphs summarize the survey results.

Tree Species: The survey requested licensees to report on whether the timber harvested on each licence for 2008 was predominantly pine stands, spruce, deciduous, hemlock cedar, or other species. The survey participants reported that pine leading stands account for 92% of the timber harvest in the Quesnel FD, 85% in the Central Cariboo FD and 96% of the Chilcotin FD harvest. Other species include mainly spruce, Douglas fir and deciduous trees.

Mountain Pine Beetle (MPB) Infestation: The AACs for the Quesnel TSA and Williams Lake TSA have almost doubled since the year 2000 in order to provide each region with sufficient AAC to salvage timber infested by the MPB epidemic. One licensee in the Prince George TSA who was contacted as part of a similar study in 2007 for that region, speculated that timber harvesting employment coefficients would be higher for areas highly infected by the MPB because the yield per acre (i.e. m3 of wood harvested per acre) would likely be much lower in those infected areas. MPB could also affect wood processing coefficients.

The 2008 survey for the Cariboo region asked survey participants to report on the degree of infestation of the timber harvest. The survey results show that approximately 91% of the timber harvest consists of pine leading stands, and all pine leading stands are MPB infested. Also, while all MPB infested wood is dead at time of harvest, the timber remains usable for wood products and pulp processing.

Logging Methods: The survey requested data on the approximate proportions of total timber harvest through conventional ground logging, cable logging, and helicopter logging, as ground logging is typically less labour intensive than cable logging. The survey participants reported using conventional ground logging for 99.7% of the timber harvest in the region, with very minimal cable logging taking place in the Quesnel FD.

Some survey participants indicated that conventional logging has been more prevalent given the high proportion of harvest in MPB infected pine leading stands that do not require cable logging. In the Prince George TSA, a major licensee contacted as part of a similar survey for that region, suggested that cable logging in a given area would be 25% more labour intensive than Cut-to-Length short log contracts and approximately 35% more labour intensive than conventional ground logging (long log) contracts.

% of Harvesting in Mountain Caribou Habitat Areas: The survey requested information on the approximate percentage of harvest in Mountain Caribou Habitat areas. Only one survey participant reported very minimal harvest in a Mountain Caribou Habitat area. Many survey participants noted that the current focus on harvesting MPB infected pine leading stands has kept licensees outside Mountain Caribou Habitat areas.

Additional Employment from Incremental Silviculture Activities: The survey requested licensees to indicate if they carried out additional silviculture such as fertilizing, pruning, and pre-commercial thinning in 2006, 2007 and 2008. This would be in addition to the basic silviculture activities such as planting and brushing reported as part of the survey.

- One licensee reported employment related to fertilizing – approximately one month of work for 4 to 6 people including one helicopter.
- Another licensee reported activities related to the Forest Investment Account (FIA) Land Base Investment Program (LBIP).¹⁰ The BC Government established the FIA in 2002 to help improve the forest asset base and support sustainable forest management practices in BC. LBIP projects are planned and delivered by licensees and administered through a third party (PricewaterhouseCoopers). Between 2002 and September 2008, some 2,598 projects representing an investment of \$90.4 million were undertaken in the Southern Interior region, an area much greater than the Central Cariboo region. The majority of funding to September 30, 2008 has focused on vegetation resources inventory, wildlife and wildlife habitat, fertilization, and fish passage activities. Employment estimates related to the FIA work is not available and as a result has been excluded from this study.

¹⁰ BC Ministry of Forests and Range, *Forest Investment Account (FIA). Forest Investment Account Land Base Investment Program, 2008/09 Annual Update*, 8 pages.

Appendices

The following numbered appendices provide data for the following Forest Districts and management units:

Appendix 1: Quesnel Forest District including Quesnel TSA Licences and TFL 52 (West Fraser Mills)

Appendix 2: Central Cariboo Forest District

Appendix 3: Chilcotin Forest District

Appendix 4: All three Forest Districts, namely Quesnel, Central Cariboo and Chilcotin as well as TFL 52.

Appendix 5: Provides the list of manufacturing facilities in the Central Cariboo region that were considered in estimating employment and other data from manufacturing operations

Appendix 6: Provides selected references.

APPENDIX 1 QUESNEL FOREST DISTRICT SURVEY RESULTS

Quesnel Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels	2005	Quesnel FD Timber Harvest (m3)				2008 AAC Volume (m3) for Quesnel FD	
				2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Problem Forest Types & Deciduous
TSA Licences									
Ainsworth Lumber Co. Ltd.	A74718	Forest Licence, Non-Replaceable; Deciduous Leading Stands							20,000
	A76553	Forest Licence, Non-Replaceable						700,000	
Sub-Total Ainsworth			0	0	0	15,151	5,050	700,000	20,000
Amabilis Contracting Ltd.	A77509	Forest Licence, Non-Replaceable; Problem Forest Types; with Avril Cherie Timber Company Inc.	0	0	124,299	235,496	119,932		75,000
Billiboy's Logging and Contracting	A65107	Forest Licence, Non-Replaceable	85,826	37,882	145	0	12,676	15,000	
Borland Creek Logging	A60473	Forest Licence, Non-Replaceable	4,933	20,720	8,398	0	9,706	15,000	
Canadian Forest Products	A20011	Forest Licence, Replaceable						382,194	
	A67546	Forest Licence, Non-Replaceable						140,000	
	A75167	Forest Licence, Non-Replaceable						25,000	
	A83420	Forest Licence, Non-Replaceable						166,667	
	A59411	BCTS Forest Licence, Non-Replaceable;						40,000	
Sub-Total Canfor		Harvest as reported by MOFR & confirmed by licensee	859,309	668,067	717,291	658,477	681,278	753,861	
C&C Wood Products Ltd.	A57712	Forest Licence, Non-Replaceable							120,000
	A79982	Forest Licence, Non-Replaceable						150,000	
Sub-Total C & C			191,079	157,077	217,461	235,309	203,282	150,000	120,000
Eberding Timber Ltd.	A78603	Forest Licence, Replaceable	0	0	0	0	0	2,034	
Gunderson	A65878	BCTS Forest Licence, Non-Replaceable;	0	0	0	0	0	3,000	
Kluskus Management Holdings Ltd.	A69604	Forest Licence, Non-Replaceable	9	5,186	34,727	154,587	64,833	53,371	
M & K Sawmills Ltd.	A61545	BCTS Forest Licence, Non-Replaceable;	41,870	63,360	55,922	47,604	55,629	10,000	
Ndazkhot'en Forest Management Ltd.	A64708	Forest Licence, Non-Replaceable						15,000	
	A65926	Forest Licence, Non-Replaceable						70,000	
	A81934	Forest Licence, Non-Replaceable						125,000	

Quesnel Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels	2005	Quesnel FD Timber Harvest (m3)				2008 AAC Volume (m3) for Quesnel FD	
				2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Problem Forest Types & Deciduous
Sub-Total Ndazkhot'en			26,647	95,473	131,027	125,263	117,254	210,000	
Nazko First Nation	A74439	Forest Licence, Non-Replaceable	9,228	5	0	0	2	15,800	
Paradigm Logging Ltd.	A57963	BCTS Forest Licence, Non-Replaceable;	11,975	12,414	9,429	3,652	8,498	12,000	
Red Bluff Development Corporation	A64706	Forest Licence, Non-Replaceable	0	0	0	20,763	6,921	15,000	
RPP Holdings Inc.	A76729	Forest Licence, Non-Replaceable;	0	0	0	0	0	300,000	
Sigurdson Bros. Logging Company	A80598	Forest Licence, Non-Replaceable	195,975	77,993	0	0	25,998	250,000	
Tolko Industries Ltd.	A20010	Forest Licence, Replaceable						259,704	53,000
	A57713	Forest Licence, Non-Replaceable, Problem Forest Type							
	A67547	Forest Licence, Non-Replaceable						140,000	
	A78588	Forest Licence, Non-Replaceable						10,000	
	A80599	Forest Licence, Non-Replaceable						100,000	
	A80600	Forest Licence, Non-Replaceable						130,000	
	A83419	Forest Licence, Non-Replaceable						166,667	
	A61546	BCTS Forest Licence, Non-Replaceable;						21,429	
Sub-Total Tolko Industries			763,151	742,902	808,773	1,067,075	872,917	827,800	53,000
West Fraser Mills Ltd.	A20005	Forest Licence, Replaceable						192,826	
	A20013	Forest Licence, Replaceable						400,790	
	A67545	Forest Licence, Non-Replaceable						150,000	
	A75166	Forest Licence, Non-Replaceable						50,000	
	A78589	Forest Licence, Non-Replaceable						10,000	
	A80597	Forest Licence, Non-Replaceable						166,666	
Sub-Total West Fraser			880,003	1,071,342	978,687	1,028,574	1,026,201	970,282	
Xat'sull Logging Ltd.	A64707	Forest Licence, Non-Replaceable	45,927	40,531	0	0	13,510	15,000	
690361 BC Ltd.	A64709	Forest Licence, Non-Replaceable; Per MOFR list, associated with Yun Ka Whut'en Holdings Ltd. & West Chilcotin Forest Products Ltd.	34,247	41,518	8,270	15,863	21,884	15,000	

Quesnel Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels	2005	Quesnel FD Timber Harvest (m3)				2008 AAC Volume (m3) for Quesnel FD	
				2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Problem Forest Types & Deciduous
Sub-Total TSA - Forest Licences			3,150,179	3,034,470	3,094,429	3,607,814	3,245,571	4,333,148	268,000
TREE FARM LICENCES (TFLs):									
West Fraser Mills Ltd.	TFL 5		74,623	160,345	147,884	44,845	117,691		
BCTS and Other	TFL 5	Armand Paquet Contracting Ltd. and in 2008, BC Customs Timber Products	0	25,506	24,342	30,212	26,687		
West Fraser Mills Ltd.	TFL 52	Includes Schedule A licence (2,100 m3) and Schedule B licence (750,722 m3)	1,015,664	611,014	776,234	721,672	702,973	752,822	
BCTS and Other	TFL 52	Includes harvest by BC 635735 Ltd., Cariboo Truss and Sure-Spar Logging, and in 2008, AI Contracting, Marlo Logging Ltd., Metod Novak, and various others; AAC includes BCTS AAC in TFL 52 (40,693 m3) and other licences (76,485 m3)	30,604	50,531	71,741	161,629	94,634	117,178	
Sub-Total - TSA Forest Licences and TFL listed above			4,271,070	3,881,866	4,114,630	4,566,172	4,187,556	5,203,148	268,000
Woodlot Licences		From MOFR AAC Apportionment						20,512	
Forest Service Reserve		From MOFR AAC Apportionment						37,816	
Earth First Logging Ltd.		Not listed in AAC Apportionment				48,018	48,018		
Gibraltar Mines		Not listed in AAC Apportionment				8,166	8,166		
Larson, Doug		Not listed in AAC Apportionment				64,017	64,017		
Lidder, Nirmal		Not listed in AAC Apportionment				46,266	46,266		
Pine Ideas Ltd.		Not listed in AAC Apportionment				82,290	82,290		
Pinnacle Pellet		Not listed in AAC Apportionment				33,490	33,490		
R. Brink Enterprises		Not listed in AAC Apportionment				27,631	27,631		
John Belyea		Not listed in AAC Apportionment				16,051	16,051		
Vernon Reimer		Not listed in AAC Apportionment				12,083	12,083		
Thomas Sword		Not listed in AAC Apportionment				32,998	32,998		

Quesnel Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels	2005	Quesnel FD Timber Harvest (m3)				2008 AAC Volume (m3) for Quesnel FD	
				2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Problem Forest Types & Deciduous
Wayne Telford		Not listed in AAC Apportionment				21,512	21,512		
Glenn Williamson		Not listed in AAC Apportionment				25,214	25,214		
Zapper Contracting		Not listed in AAC Apportionment				51,149	51,149		
367079 BC Ltd.		Not listed in AAC Apportionment	-34	28,483	91,282	72,893	64,219		
635735 BC Ltd.		Not listed in AAC Apportionment	47,947	56,172	1,779	0	19,317		
Akal Forest Products		Not listed in AAC Apportionment		2,718	29,004	9,363	13,695		
Blackwater Timber Ltd.		Not listed in AAC Apportionment		9,293	25,495	16,211	17,000		
Cariboo Truss Ltd.		No Forest Licence listed in AAC Apportionment; includes harvest in TSA & TFL 52	59,568	91,720	45,876	22,267	53,288		
Jordef Enterprises Ltd.		Not listed in AAC Apportionment			107,714	40,906	74,310		
5C Cattle Company Ltd.		Not listed in AAC Apportionment	5,232	12,040	5,080	0	5,707		
DASC Industries Ltd.		Not listed in AAC Apportionment			19,625	0	9,813		
Trout Lake Farms Ltd.		Not listed in AAC Apportionment	4,763	-23	13,920	0	4,632		
Sub-Total			117,476	200,403	339,775	630,525	390,234		
Other Harvest Not Included in Above Commitments		Includes BCTS sales not included in above commitments, community forest licences, woodlot licences and Forest Service Reserve	957,261	682,296	295,689	100,786	359,590	418,524	202,000
TOTAL PROVINCIAL CROWN HARVEST			5,228,331	4,564,162	4,750,094	5,297,483	4,870,580	5,680,000	470,000
TOTAL PRIVATE HARVEST		MOFR Volume by scale date	133,427	38,875	33,984	43,464	38,774		
TOTAL HARVEST		MOFR Volume by scale date	5,361,758	4,603,037	4,784,078	5,340,947	4,909,354		
Survey Coverage Based on Harvest (m3)				3,661,118	4,190,720	4,603,735	4,151,858		
Survey Harvest Volume Coverage (% of Total Harvest)				79.5%	87.6%	86.2%	84.6%		

Source:

The harvest data noted as being based on MOFR data are from the MOFR Harvest Billing System, as provided by Mark Messmer of MOFR (March 27, 2009).

All other harvest data are from the Pierce Lefebvre Consulting survey of licensees, which was conducted for this project.

MOFR - Apportionment System - TSA AAC, *Apportionment and Commitments, Quesnel TSA*, as of November 10, 2008.

AAC for Community Forest: MOFR, *Community Forest Agreements*, April 2008; MOFR website: <http://www.for.gov.bc.ca/hth/community/Documents/status-table-april-2008.pdf>.

Quesnel Survey Results - Destination of Quesnel FD Timber Harvest	Quesnel 2006	Quesnel 2007	Quesnel 2008	Quesnel 3-Yr Average
Total Reported Harvested Volumes (m3)	3,661,118	4,190,720	4,603,735	4,151,858
Proportion of Total Volumes Harvested:				
Export Volume	0.0%	0.0%	0.0%	0.0%
Quesnel FD	95.5%	95.6%	95.5%	95.4%
Central Cariboo FD	0.6%	0.2%	0.2%	0.3%
Chilcotin FD	0.0%	0.0%	0.0%	0.0%
Prince George TSA	3.9%	4.2%	4.3%	4.3%
Kamloops Forest District	0.0%	0.0%	0.0%	0.0%
Lillooet - Cascades FD	0.0%	0.0%	0.0%	0.0%
100 Mile House	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>
TOTAL VOLUME	100.0%	100.0%	100.0%	100.0%

Quesnel Survey Results - Harvesting Employment - Person Years (PY)	Quesnel 2006	Quesnel 2007	Quesnel 2008
Harvesting/ Falling	304	346	377
Planning & Administration	69	77	79
Log Hauling / Trucking	137	162	182
Barging / Towing	0	0	0
Road Building	28	32	38
Silviculture	150	170	187
Other	4	5	5
Total	692	792	867

Quesnel Survey Results - Full Time Harvesting Employment	Full Time Jobs			% Residing in Quesnel
	Quesnel 2006	Quesnel 2007	Quesnel 2008	
Harvesting/ Falling	303	345	376	15%
Planning & Administration	69	77	79	18%
Log Hauling / Trucking	137	162	182	19%
Barging / Towing	0	0	0	0%
Road Building	28	32	38	22%
Silviculture	70	83	96	18%
Other	0	0	0	0%
Total	607	699	771	17%
Quesnel Survey Results - Part Time Employment	Part Time Jobs			% Residing in Quesnel
	Quesnel 2006	Quesnel 2007	Quesnel 2008	
Harvesting/ Falling	2	2	2	100%
Planning & Administration	0	0	0	0%
Log Hauling / Trucking	0	0	0	0%
Barging / Towing	0	0	0	0%
Road Building	0	0	0	0%
Silviculture	265	292	308	7%
Other	75	84	87	40%
Total	342	377	397	15%

Quesnel Survey Results - % of Employees by Residence Location	Quesnel 2006	Quesnel 2007	Quesnel 2008	Quesnel 3-Yr Average
Quesnel FD				
Quesnel	70%	67%	64%	67%
Nazko & Surrounding Region	4%	4%	4%	4%
Sub-Total Quesnel FD	74%	71%	68%	71%
Central Cariboo FD				
Williams Lake	11%	13%	16%	13%
McLeese Lake/ Soda Creek	1%	2%	2%	2%
Sub-Total Central Cariboo FD	12%	15%	18%	15%
Alexis Creek & Surrounding	0%	0%	0%	0%
Anahim Lake & Surrounding	0%	0%	0%	0%
Other Chilcotin FD	0%	0%	0%	0%
Sub-Total Chilcotin FD	0%	0%	0%	0%
Prince George	1%	1%	1%	1%
Smithers	1%	1%	1%	1%
Other	0%	0%	0%	0%
Sub-Total - Other BC Interior	1%	1%	1%	1%
Lower Mainland	0%	0%	0%	0%
Other (please specify):	13%	13%	12%	12%
Total	100%	100%	100%	100%

Quesnel Survey Results - Person Years (PY) of Direct Harvesting Related Employment per 1,000 m3 of Timber Harvested	Quesnel 2006	Quesnel 2007	Quesnel 2008	Quesnel 3-Yr Average
Harvesting/ Falling	0.083	0.083	0.082	0.082
Planning & Administration	0.019	0.018	0.017	0.018
Log Hauling / Trucking	0.037	0.039	0.039	0.039
Barging / Towing	0.000	0.000	0.000	0.000
Road Building	0.008	0.008	0.008	0.008
Silviculture	0.041	0.041	0.041	0.041
Other	0.001	0.001	0.001	0.001
Total	0.189	0.189	0.188	0.189
Direct Employment by Employee Residence				
Quesnel FD	0.140	0.134	0.129	0.134
Central Cariboo FD	0.022	0.028	0.034	0.029
Chilcotin FD	0.000	0.000	0.000	0.000
Other BC Interior	0.003	0.003	0.003	0.003
Lower Mainland and Other (mainly planting crews)	0.024	0.024	0.023	0.024
Total	0.189	0.189	0.188	0.189

Survey Coverage by Harvest Volume	Quesnel 2006	Quesnel 2007	Quesnel 2008	Quesnel 3-Yr Average
Total Harvest Reported by MOFR	4,603,037	4,784,078	5,340,947	4,909,354
Reported Volume	3,661,118	4,190,720	4,603,735	4,151,858
Survey Coverage	80%	88%	86%	85%

Direct Employment Impacts (PY) from Quesnel FD Timber Harvest (Extrapolated to Total Industry)	Quesnel 2006	Quesnel 2007	Quesnel 2008	Quesnel 3-Yr Average	3 Year Average % of Total
Direct Harvesting & Silviculture Employment by Employee Residence:					
Quesnel FD	615	640	714	656	24%
Central Cariboo FD	132	137	153	141	5%
Chilcotin FD	1	1	1	1	0%
Other BC Interior	12	13	14	13	0%
Lower Mainland and Other (mainly planting crews)	108	113	126	116	4%
Total Harvesting and Silviculture	869	903	1,008	927	33%
Processing Employment in Central Cariboo Region:					
Wood Products Processing	1,629	1,536	1,389	1,518	54%
Primary Pulp and Paper in CC Region	253	263	294	270	10%
Sub-Total	1,883	1,799	1,682	1,788	64%
Primary Processing Outside Central Cariboo Region	69	72	80	74	3%
Total BC Direct Impacts	2,820	2,774	2,771	2,788	100%
ASSUMPTIONS					
Total Timber Harvest (MOFR) (m3)	4,603,037	4,784,078	5,340,947	4,909,354	
Exports Based on Survey	0.0%	0.0%	0.0%	0.0%	
Volume Processed in BC (m3)	4,603,037	4,784,078	5,340,947	4,909,354	
BC Employment Coefficients (PY per 000 m3):					
Harvesting and Silviculture (3 Year Average from Survey)	0.189	0.189	0.189	0.189	32%
Primary Wood Products Processing in CC Region	0.354	0.321	0.260	0.331	56%
Primary Pulp and Paper in CC Region	0.055	0.055	0.055	0.055	9%
Primary Processing Outside CC Region	0.015	0.015	0.015	0.015	3%
Total - Direct Primary Impacts	0.613	0.580	0.519	0.590	100%

Survey Results - Timber Harvesting Characteristics	Quesnel 2006	Quesnel 2007	Quesnel 2008	Quesnel 3-Yr Average
% Pine Leading Stands	90.9%	91.6%	91.8%	91.5%
% Conventional Ground Logging	99.5%	99.5%	99.6%	99.6%
% Cable Logging	0.5%	0.5%	0.4%	0.4%
% Helicopter Logging	0.0%	0.0%	0.0%	0.0%
Sub-Total	100.0%	100.0%	100.0%	100.0%
% Timber Affected by MPB	92.8%	93.4%	93.7%	93.3%
% Dead Wood (Beetle Killed)	91.1%	90.8%	91.0%	91.0%
% Usable for Solid Wood Products	99.2%	98.2%	98.3%	98.5%
% from Mountain Caribou Habitat	0.0%	0.0%	0.0%	0.0%

APPENDIX 2 CENTRAL CARIBOO FOREST DISTRICT SURVEY RESULTS

This Appendix provides data for the Central Cariboo Forest District.

Central Cariboo Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Level - Unless noted, all operations are in the Central Cariboo Forest District	Licence Area/ Primary Location of Harvest	2005	Central Cariboo Forest District (FD) Timber Harvest				2008 Williams Lake Conventional AAC Volume (m3) Allocated to DCC (note 1)
					2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	
Amabilis Contracting Ltd. (& joint-venture / affiliated companies (note 2))	A79575	Non-Replaceable Forest Licence; expires 2012; assume all in DCC as other licences are primarily in DCH and MOFR reports significant harvest in DCC for Amabilis & affiliated companies	DCC and DCH west of Fraser; not in 3 Western Supply Blocks (WSB)	1,528	0	99,212	130,608	76,607	100,000
Big 6 Contracting	A77617	Non-Replaceable Forest Licence; expires 2015; licence area is in DCC & DCH; for this study, licence is allocated by FD based on timber harvest.	DCC & DCH - west of Fraser River; not in WSB		62,430	112,465	123,650	99,515	112,653
Esketemc First Nation	A73239	Non-Replaceable Forest Licence;	DCC						21,400
	A74437	Non-Replaceable Forest Licence;	DCC						38,263
Sub-Total Esketemc				47,284	59,450	118,699	44,039	74,063	59,663
Johnson	A19977	TSL <= 10,000 M3; Replaceable	DCC						2,058
Klatassine Resources Ltd.	A81390	Non-Replaceable Forest Licence; expires 2012; No harvest reported by MOFR for 2006 & 2007; licence located in Anahim Traditional Territory (assume half in DCH and half in DCC)	DCC & DCH						36,730
Linde Bros. Lumber Ltd.	A19976	TSL <= 10,000 M3; Replaceable	DCC	2,902	3,871	3,703	3,065	3,546	8,702
Pal Lumber Co. Ltd.	A64734	BCTS non-replaceable forest licence; includes PAL & Son Custom Planing Ltd.; No longer in operation; licence area is in DCC & DCH; for this study, licence is allocated by FD based on timber harvest	Not operating - DCC & DCH	46,842	57,655	10,013	0	22,556	11,409
Sigurdson Bros Logging Company Ltd.	A73558	Non-Replaceable Forest Licence; expires 2009; licence is for DCC but one time amendment into DCH	Primarily DCC; assume all DCC						150,000

Central Cariboo Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Level - Unless noted, all operations are in the Central Cariboo Forest District	Licence Area/ Primary Location of Harvest	2005	Central Cariboo Forest District (FD) Timber Harvest				2008 Williams Lake Conventional AAC Volume (m3) Allocated to DCC (note 1)
					2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	
Sub-Total Sigurdson	A79577	Non-Replaceable Forest Licence; expires 2011	DCC & DCH but not in WSB - west of Fraser River, assume all DCC						50,000
		from MOFR		22,237	147,645	176,518	131,180	151,781	200,000
Tl'etinqox Logging Ltd.	A65106	BCTS Non-Replaceable Forest Licence; expires 2011; owned by Anahim Lake First Nation; licence area is in DCC & DCH; for this study, licence is allocated by FD based on timber harvest	DCC & DCH - west of Fraser River; not in WSB		3,498	0	0	1,166	570
Tolko Industries Ltd.	A20015	Replaceable Forest Licence; expires 2023	DCC						314,837
	A20016	Replaceable Forest Licence; expires 2023	DCC						114,129
	A20018	Replaceable Forest Licence; expires 2023 - apportionment is 316,416 m3 from Jan 1, 2007 to Aug. 31, 2011 when AAC returns to 291,146 m3	DCC						316,416
	A20019	Replaceable Forest Licence; expires 2023	DCC						322,586
	A54417	Non-Replaceable Forest Licence; expires 2007; non-AAC volume was 180,000 m3	expired						0
	A79576	Non-Replaceable Forest Licence	DCC						50,000
Sub-Total Tolko				1,824,619	1,798,763	1,246,076	1,050,702	1,365,180	1,117,968
West Fraser Mills Ltd.	A20017	Replaceable Forest Licence	DCC						459,102
	A20020	Replaceable Forest Licence	DCC						95,283
	A20021	Replaceable Forest Licence	DCC						104,837
	A55902	Licence expired in 2007; per MOFR listing, was 50,000 m3 in AAC	expired						0
Sub-Total West Fraser				835,480	718,222	642,776	881,247	747,415	659,222
Xat'sull General Partner Ltd.	A82105	from MOFR Apportionment; owned by Soda Creek Nation, a partner in Likely Xat'sull Community Forest	DCH and DCC, but no harvest; assume all DCC	0	0	0	0	0	18,026

Central Cariboo Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Level - Unless noted, all operations are in the Central Cariboo Forest District	Licence Area/ Primary Location of Harvest	2005	Central Cariboo Forest District (FD) Timber Harvest				2008 Williams Lake Conventional AAC Volume (m3) Allocated to DCC (note 1)
					2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	
Sub-Total TSA - Forest Licences		Harvest represents scaled data as reported in the survey		2,780,892	2,851,534	2,409,462	2,364,491	2,541,829	2,327,000
Community Forest Agreement		MOFR harvest is from: Likely Xat'sull Community Forest - near Likely/Horsefly (all DCC); WSB partition allocated to DCH with rest allocated to DCC	WCB partition in DCH; assume balance in DCC	51,461	105,681	25,284	3,012	44,659	20,000
Forest Service Reserve									60,000
SUB-TOTAL HARVEST/ COMMITMENTS				2,832,353	2,957,215	2,434,746	2,367,503	2,586,488	2,407,000
Other Harvest Not Included in Above Commitments:									
A.I. Contracting Ltd.		Not listed in AAC Apportionment			0	26,213	48,008	24,740	
AKAL Forest Products Ltd.		Not listed in AAC Apportionment			0	21,157	0	7,052	
BC 635735		Not listed in AAC Apportionment			44,100	21,584	0	21,895	
Jackpine Forest Products Ltd.		Includes Jackpine Engineered Products; no longer operating; licence of 20,000 m3 closed as of August 2006	both DCC & DCH	174,102	38,186	28	0	12,738	
Little Lake Timber		Not listed in AAC Apportionment		12,953	3,595	7,199	3,155	4,650	
M & K Sawmills		Based in Quesnel	DCC		0	16,086	0	5,362	
Parallel Wood Products Ltd.		Based in Prince George	DCC	39,378	23,793	0	0	7,931	
Pinnacle Pellet WL Inc.		Operates plants in Quesnel and Williams Lake	DCC	16,318	39,030	20,955	0	19,995	
Tsilhqot'in Forest Products Inc.		Operates in both districts based on MOFR harvest reported for DCC & DCH; some affiliation with West Fraser Mills	both DCC & DCH	0	248,016	82,527	0	110,181	
Ken Ilnicki Developments Ltd.		Not listed in AAC Apportionment	Assume all DCC		0	0	37,081	12,360	
District Manager - Central Cariboo		Not listed in AAC Apportionment	Assume all DCC		0	0	7,116	2,372	
Ronald Kohnke		Not listed in AAC Apportionment	Assume all DCC		0	0	39,957	13,319	
Robert Menzies		Not listed in AAC Apportionment	Assume all DCC		0	0	75,083	25,028	

Central Cariboo Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Level - Unless noted, all operations are in the Central Cariboo Forest District	Licence Area/ Primary Location of Harvest	2005	Central Cariboo Forest District (FD) Timber Harvest				2008 Williams Lake Conventional AAC Volume (m3) Allocated to DCC (note 1)
					2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	
Robert Weetman		Not listed in AAC Apportionment	Assume all DCC		0	0	39,964	13,321	
Andrew Turner		Not listed in AAC Apportionment	Assume all DCC		0	0	23,834	7,945	
William Moore		Not listed in AAC Apportionment	Assume all DCC		0	0	11,398	3,799	
R. Brink Enterprises		Not listed in AAC Apportionment	Assume all DCC		0	0	52,174	17,391	
Sugar Cane Development Corporation		Not listed in AAC Apportionment	Assume all DCC		0	0	32,121	10,707	
University of BC		Research forest	DCC	31,364	23,051	26,254	13,405	20,903	
Sub-Total - Other Harvest Not in Above Commitments				274,115	419,771	222,003	383,296	341,690	included below
Other Harvest / AAC Not Included in Above Commitments		Includes BCTS sales not included in above commitments & harvest data, may also include community forest licences & woodlot licences not included above; licensed conventional volume is allocated between DCH and DCC based on MOFR timber harvest	DCC & DCH	568,541	605,093	412,932	87,472	368,499	2,486,578
TOTAL CROWN HARVEST / AAC				3,675,009	3,982,079	3,069,681	2,838,271	3,296,677	4,893,578
FEDERAL HARVEST		Indian and Northern Affairs		6,962	2,566	4,604	208	2,459	
TOTAL PRIVATE HARVEST		MOFR Volume by scale date		91,338	91,996	52,650	32,598	59,081	
TOTAL HARVEST		MOFR Volume by scale date		3,773,309	4,076,641	3,126,935	2,871,077	3,358,218	
Survey Coverage Based on Harvest (m3)		Includes a very small amount of harvest (approx. 20,000 m3) in the Prince George FD			2,705,428	2,124,927	2,181,928	2,337,428	
Survey Harvest Volume Coverage (% of Total Harvest)					66.4%	68.0%	76.0%	69.6%	

Notes:

1. The Allowable Annual Cut (AAC) for Williams Lake TSA excludes a pulpwood agreement licence for 107,000 m3 of deciduous trees.
2. Amabilis Contracting Ltd. also includes Chichelean Timber Co. Ltd., Avril Cherie Timber Company Inc., Kodiak Bear Timber Co. Ltd., and Maheca Timber Co. Ltd.

Source:

- MOFR - Apportionment System - TSA AAC, *Apportionment and Commitments, Williams Lake TSA*, as of November 10th, 2008.
- The harvest data noted as being based on MOFR data are from the MOFR Harvest Billing System, as provided by Mark Messmer of MOFR (March 27, 2009).
- All other harvest data are from the Pierce Lefebvre Consulting survey of licensees, which was conducted for this project.
- AAC for Community Forest: MOFR, *Community Forest Agreements*, April 2008; MOFR website: <http://www.for.gov.bc.ca/hth/community/Documents/status-table-april-2008.pdf>.

Central Cariboo FD Survey Results - Destination of Timber Harvest from the Central Cariboo FD	CC FD 2006	CC FD 2007	CC FD 2008	CC FD 3 Year Average
Total Reported Harvested Volumes (m3)	2,705,428	2,124,927	2,181,928	2,337,428
Proportion of Total Volumes Harvested:				
Export Volume	0.0%	0.0%	0.0%	0.0%
Quesnel FD	0.4%	0.5%	0.6%	0.5%
Central Cariboo FD	98.8%	93.8%	92.5%	89.5%
Chilcotin FD	0.0%	0.0%	0.0%	0.0%
Prince George TSA	0.0%	4.7%	6.0%	9.2%
Kamloops Forest District	0.3%	0.4%	0.2%	0.3%
Lillooet - Cascades FD	0.1%	0.2%	0.1%	0.1%
100 Mile House	<u>0.4%</u>	<u>0.5%</u>	<u>0.6%</u>	<u>0.5%</u>
TOTAL VOLUME	100.0%	100.0%	100.0%	100.0%

Central Cariboo FD Survey Results - Harvesting Employment - Person Years (PY)	CC FD 2006	CC FD 2007	CC FD 2008
Harvesting/ Falling	321	245	207
Planning & Administration	76	72	65
Log Hauling / Trucking	226	162	131
Barging / Towing	1	1	0
Road Building	10	10	9
Silviculture	115	98	80
Other	1	1	1
Total	749	589	493

Central Cariboo FD Survey Results - Full Time Harvesting Employment	Full Time Jobs			% Residing in CC FD
	CC FD 2006	CC FD 2007	CC FD 2008	
Harvesting/ Falling	289	230	201	94%
Planning & Administration	73	71	65	91%
Log Hauling / Trucking	218	158	129	92%
Barging / Towing	0	0	0	0%
Road Building	9	9	9	91%
Silviculture	43	33	28	82%
Other	0	0	0	0%
Total	632	501	432	92%
Central Cariboo FD Survey Results - Part Time Employment	Part Time Jobs			% Residing in CC FD
	CC FD 2006	CC FD 2007	CC FD 2008	
Harvesting/ Falling	62	53	32	95%
Planning & Administration	20	19	16	94%
Log Hauling / Trucking	44	40	24	97%
Barging / Towing	3	3	3	100%
Road Building	16	15	14	97%
Silviculture	372	318	272	36%
Other	5	5	5	20%
Total	522	453	366	52%

Central Cariboo FD Survey Results - % of Employees by Residence Location	CC FD 2006	CC FD 2007	CC FD 2008	CC FD 3 Year Average
Quesnel FD				
Quesnel	6%	5%	5%	5%
Nazko & Surrounding Region	3%	4%	5%	4%
Sub-Total Quesnel FD	9%	9%	9%	9%
Central Cariboo FD				
Williams Lake	71%	71%	70%	71%
McLeese Lake/ Soda Creek	12%	13%	13%	13%
Sub-Total Central Cariboo FD	83%	83%	83%	83%
Alexis Creek & Surrounding	1%	1%	1%	1%
Anahim Lake & Surrounding	0%	0%	0%	0%
Other Chilcotin FD	0%	0%	0%	0%
Sub-Total Chilcotin FD	1%	1%	2%	1%
Prince George	0%	0%	0%	0%
Other	0%	0%	0%	0%
Sub-Total - Other BC Interior	0%	0%	0%	0%
Other (please specify):	6%	6%	6%	6%
Total	100%	100%	100%	100%

Central Cariboo FD Survey Results - Person Years (PY) of Direct Harvesting Related Employment per 000 m3 of Timber Harvested	CC FD 2006	CC FD 2007	CC FD 2008	CC FD 3 Year Average
Harvesting/ Falling	0.119	0.115	0.095	0.110
Planning & Administration	0.028	0.034	0.030	0.030
Log Hauling / Trucking	0.083	0.076	0.060	0.074
Barging / Towing	0.000	0.000	0.000	0.000
Road Building	0.004	0.005	0.004	0.004
Silviculture	0.043	0.046	0.036	0.042
Other	0.000	0.000	0.000	0.000
Total	0.277	0.277	0.226	0.261
Direct Employment by Employee Residence				
Quesnel FD	0.026	0.026	0.021	0.024
Central Cariboo FD	0.231	0.231	0.189	0.218
Chilcotin FD	0.003	0.004	0.003	0.004
Other BC Interior	0.000	0.000	0.000	0.000
Lower Mainland and Other (mainly planting crews)	0.016	0.017	0.013	0.015
Total	0.277	0.277	0.226	0.261

Survey Coverage by Harvest Volume	CC FD 2006	CC FD 2007	CC FD 2008	CC FD 3 Year Average
Total Harvest Reported by MOFR	4,076,641	3,126,935	2,871,077	3,358,218
Reported Volume	2,705,428	2,124,927	2,181,928	2,337,428
Survey Coverage	66%	68%	76%	70%

Direct Employment Impacts (PY) from CC Region Timber Harvest (Extrapolated to Total Industry)	CC FD 2006	CC FD 2007	CC FD 2008	CC FD 3 Year Average	3 Year Average % of Total
Direct Harvesting & Silviculture Employment by Employee Residence:					
Quesnel FD	99	76	70	82	4%
Central Cariboo FD	888	681	625	731	34%
Chilcotin FD	15	11	10	12	1%
Other BC Interior	0	0	0	0	0%
Lower Mainland and Other (mainly planting crews)	63	48	44	52	2%
Total Harvesting and Silviculture	1,065	817	750	877	40%
Processing Employment in Central Cariboo Region:					
Wood Products Processing	1,443	1,004	746	1,064	49%
Primary Pulp and Paper in CC Region	224	172	158	185	8%
Sub-Total	1,667	1,176	904	1,249	57%
Primary Processing Outside Central Cariboo Region	61	47	43	50	2%
Total BC Direct Impacts	2,793	2,039	1,697	2,177	100%
ASSUMPTIONS					
Total Timber Harvest (MOFR) (m3)	4,076,641	3,126,935	2,871,077	3,358,218	
Exports Based on Survey	0.0%	0.0%	0.0%	0.0%	
Volume Processed in BC (m3)	4,076,641	3,126,935	2,871,077	3,358,218	
BC Employment Coefficients (PY per 1,000 m3):					
Harvesting and Silviculture (3 Year Average from Survey)	0.261	0.261	0.261	0.261	39%
Primary Wood Products Processing in CC Region	0.354	0.321	0.260	0.331	50%
Primary Pulp and Paper in CC Region	0.055	0.055	0.055	0.055	8%
Primary Processing Outside CC Region	0.015	0.015	0.015	0.015	2%
Total - Direct Primary Impacts	0.685	0.652	0.591	0.662	100%

Survey Results - Timber Harvesting Characteristics	CC FD 2006	CC FD 2007	CC FD 2008	CC FD 3 Year Average
% Pine Leading Stands	87.9%	88.7%	87.5%	88.0%
% Conventional Ground Logging	100.0%	100.0%	100.0%	100.0%
% Cable Logging	0.0%	0.0%	0.0%	0.0%
% Helicopter Logging	0.0%	0.0%	0.0%	0.0%
Sub-Total	100.0%	100.0%	100.0%	100.0%
% Timber Affected by MPB	86.6%	87.2%	85.5%	86.4%
% Dead Wood (Beetle Killed)	77.3%	78.1%	76.3%	77.2%
% Usable for Solid Wood Products	88.6%	90.0%	88.9%	89.1%
% from Mountain Caribou Habitat	0.7%	0.8%	1.0%	0.8%

APPENDIX 3 CHILCOTIN FOREST DISTRICT SURVEY RESULTS

This Appendix provides data for the Chilcotin Forest District.

Chilcotin Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels - Unless noted, all operations are in the Chilcotin Forest District (DCH)	Licence Area/ Primary Location of Harvest	2005	Chilcotin FD Timber Harvest (m3)				2008 Williams Lake AAC Volume (m3) Allocated to DCH (note 1)		Non-AAC Volumes Williams Lake TSA
					2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Western Supply Blocks (WSB)	
Amabilis Contracting Ltd. (& joint-venture / affiliated companies (note 2))	A75424	Non-Replaceable Forest Licence; expires 2010	DCH						0		10,000
	A79579	Non-Replaceable Forest Licence; expires 2016	DCH - Tatla WSB						0		60,000
	A82667	Non-Replaceable Forest Licence; expires 2013	DCH						10,000		0
	A82668	Non-Replaceable Forest Licence; expires 2013	DCH						10,000		0
Sub-Total Amabilis					0	22,254	-137	7,372	20,000		70,000
Aspel, Andre James	A79665	Non-Replaceable Forest Licence; expires 2012	DCH	0	0	0	6,693	2,231	0		10,000
Big 6 Contracting	A77617	Non-Replaceable Forest Licence; expires 2015; licence area is in DCC & DCH; for this study, licence is allocated by FD based on timber harvest.	DCC & DCH - west of Fraser River; not in WSB		0	23,076	36,145	19,740	22,347		0
Klatassine Resources Ltd.	A81390	Non-Replaceable Forest Licence; expires 2012; No harvest reported by MOFR for 2006 & 2007; licence located in Anahim Traditional Territory (assume half in DCH and half in DCC)	DCC & DCH	0	0	0	13,489	4,496	36,730		0
Pal Lumber Co. Ltd.	A64734	BCTS non-replaceable forest licence; includes PAL & Son Custom Planing Ltd.; No longer in operation; licence area is in DCC & DCH; for this study, licence is allocated by FD based on timber harvest	Not operating - DCC & DCH		21,301	0	0	7,100	3,591		0

Chilcotin Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels - Unless noted, all operations are in the Chilcotin Forest District (DCH)	Licence Area/ Primary Location of Harvest	2005	Chilcotin FD Timber Harvest (m3)				2008 Williams Lake AAC Volume (m3) Allocated to DCH (note 1)		Non-AAC Volumes Williams Lake TSA
					2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Western Supply Blocks (WSB)	
Sigurdson Bros Logging Company Ltd.	A79578	Non-Replaceable Forest Licence - Western Supply Blocks; expires 2016;	DCH - Anahim WSB						0	60,000	0
	A79580	Non-Replaceable Forest Licence; expires 2011	DCH - 3 WSBs						0		90,000
	A79664	Non-Replaceable Forest Licence; expires 2012	DCH - Anahim WSB						0		10,000
Sub-Total Sigurdson					10,467	148,587	29,069	62,708	0	60,000	100,000
Tl'etinqox Logging Ltd.	A65106	BCTS Non-Replaceable Forest Licence; expires 2011; owned by Anahim Lake First Nation; licence area is in DCC & DCH; for this study, licence is allocated by FD based on timber harvest	DCC & DCH - west of Fraser River; not in WSB		20,110	58,692	9,832	29,545	14,430		0
Tsi Del Del Enterprises Ltd.	A60508	Non-Replaceable Forest Licence - Western Supply Blocks; expires November 30, 2010	DCH - 3 WSBs	67,396	51	0	41,936	13,996		60,000	0
Tolko Industries Ltd.	A79656	Non-Replaceable Forest Licence; expires 2011	DCC & DCH but not in WSB - west of Fraser River, assume all DCH	295,305	129,690	393,729	308,655	277,358			250,000
Waddington Charter & Contracting	A75425	Non-Replaceable Forest Licence; expires 2010	DCH - Anahim WSB		11,069	37,869	-175	16,254			10,000
West Fraser Mills Ltd.	A55902	Licence expired in 2007; per MOFR listing, was 50,000 m3 in AAC	expired								
	A73557	Non-Replaceable Forest Licence; expires 2009	DCH						150,000		
Sub-Total West Fraser				38,971	42,678	57,931	160,149	86,919	150,000		
Yun Ka Whit'en Holdings Ltd. (690361 BC Ltd. on MOFR list);	A56805	Non-Replaceable Forest Licence - Western Supply Blocks; expires 2019	DCH - 3 WSBs							140,000	

Chilcotin Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels - Unless noted, all operations are in the Chilcotin Forest District (DCH)	Licence Area/ Primary Location of Harvest	Chilcotin FD Timber Harvest (m3)					2008 Williams Lake AAC Volume (m3) Allocated to DCH (note 1)		Non-AAC Volumes Williams Lake TSA
				2005	2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Western Supply Blocks (WSB)	
associated with West Chilcotin Forest Products Ltd.	A66005	Non-Replaceable Forest Licence - Western Supply Blocks; expires 2008	DCH - Tatla & Anahim WSBs							25,000	
	A72766	Non-Replaceable Forest Licence - Western Supply Blocks; expires 2008	DCH - Tatla & Anahim WSBs							25,000	
	Sub-Total Yun Ka Whut'en				242,180	94,598	118,920	9,118	74,212		190,000
Sub-Total TSA - Forest Licences		Harvest represents scaled data as reported in the survey		643,852	329,964	861,058	614,774	601,932	247,098	310,000	440,000
Community Forest Agreement		WSB partition allocated to DCH with rest allocated to DCC								25,000	
Forest Service Reserve		WSB partition allocated to DCH with rest allocated to DCC								5,000	
Other Harvest Not Included in Above Commitments:											
BC Hydro & Power Authority					0	0	4,393	1,464			
Jackpine Forest Products Ltd.		Includes Jackpine Engineered Products; no longer operating; licence of 20,000 m3 closed as of August 2006	both DCC & DCH	17,602	0	0	0	0	included below		
Tsilhqot'in Forest Products Inc.		Operates in both districts based on MOFR harvest reported for DCC & DCH; some affiliation with West Fraser Mills	both DCC & DCH	13,357	14,930	7,426	0	7,452	included below		

Chilcotin Forest District (FD) - Name of Forest Licence (FL) Holder	Licence Number	Comment on AAC and Harvest Levels - Unless noted, all operations are in the Chilcotin Forest District (DCH)	Licence Area/ Primary Location of Harvest	Chilcotin FD Timber Harvest (m3)					2008 Williams Lake AAC Volume (m3) Allocated to DCH (note 1)		Non-AAC Volumes Williams Lake TSA
				2005	2006	2007	2008	3 Yr Avg Harvest - 2006 to 2008	Conventional	Western Supply Blocks (WSB)	
Other Harvest / AAC Not Included in Above Commitments		Includes BCTS sales not included in above commitments & harvest data, may also include community forest licences & woodlot licences not included above; licensed conventional volume is allocated between DCH and DCC based on MOFR timber harvest	DCC & DCH	21,853	15,776	16,227	3,217	11,740	72,324	110,000	
TOTAL CROWN HARVEST / AAC				696,664	360,670	884,711	622,384	622,588	319,422	450,000	440,000
FEDERAL HARVEST		Indian and Northern Affairs	Indian and Northern Affairs	673	0	0	0	0			
TOTAL PRIVATE HARVEST		MOFR Volume by scale date	MOFR Volume by scale date	10,973	15,043	12,425	17,466	14,978			
TOTAL HARVEST		MOFR Volume by scale date	MOFR Volume by scale date	708,310	375,713	897,136	639,850	637,566			
Survey Coverage Based on Harvest (m3)					334,362	673,025	519,858	509,082			
Survey Harvest Volume Coverage (% of Total Harvest)					89.0%	75.0%	81.2%	79.8%			

Notes:

1. The Allowable Annual Cut (AAC) for the Williams Lake TSA excludes pulpwood agreement licence for 107,000 m3 of deciduous trees.
2. Amabilis Contracting Ltd. also includes Chichelean Timber Co. Ltd., Avril Cherie Timber Company Inc., Kodiak Bear Timber Co. Ltd., and Maheca Timber Co. Ltd.
3. The harvest data noted as being based on MOFR data are from the MOFR Harvest Billing System, as provided by Mark Messmer of MOFR (March 27, 2009).
4. All other harvest data are from the Pierce Lefebvre Consulting survey of licensees, which was conducted for this project.

Source: MOFR - Apportionment System - TSA AAC, Apportionment and Commitments, Williams Lake TSA, as of November 10th, 2008.

AAC for Community Forest: MOFR, *Community Forest Agreements*, April 2008; MOFR website: <http://www.for.gov.bc.ca/hth/community/Documents/status-table-april-2008.pdf>.

Chilcotin FD Survey Results - Destination of Timber Harvest from the Chilcotin FD	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	Chilcotin FD 3 Year Average
Total Reported Harvested Volumes (m3)	334,362	673,025	519,858	509,082
Proportion of Total Volumes Harvested:				
Export Volume	0.0%	0.0%	0.0%	0.0%
Quesnel FD	0.2%	0.1%	0.5%	0.1%
Central Cariboo FD	71.7%	79.0%	97.3%	92.2%
Chilcotin FD	27.9%	20.7%	1.7%	7.6%
Prince George TSA	0.0%	0.0%	0.0%	0.0%
Kamloops Forest District	0.0%	0.0%	0.0%	0.0%
Lillooet - Cascades FD	0.1%	0.0%	0.0%	0.0%
100 Mile House	<u>0.2%</u>	<u>0.1%</u>	<u>0.5%</u>	<u>0.1%</u>
TOTAL VOLUME	100.0%	100.0%	100.0%	100.0%

Chilcotin FD Survey Results - Harvesting Employment - Person Years (PY)	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008
Harvesting/ Falling	35	71	57
Planning & Administration	10	15	13
Log Hauling / Trucking	24	51	40
Barging / Towing	0	0	0
Road Building	3	7	6
Silviculture	13	28	20
Other	0	0	0
Total	69	172	136

Chilcotin FD Survey Results - Full Time Harvesting Employment	Full Time Jobs			% Residing in Chilcotin FD
	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	
Harvesting/ Falling	33	66	54	17%
Planning & Administration	10	15	13	15%
Log Hauling / Trucking	22	48	37	16%
Barging / Towing	0	0	0	0%
Road Building	2	6	5	15%
Silviculture	7	18	13	0%
Other	0	0	0	0%
Total	75	153	122	14%
Chilcotin FD Survey Results - Part Time Employment	Part Time Jobs			% Residing in Chilcotin FD
	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	
Harvesting/ Falling	5	12	9	24%
Planning & Administration	1	2	3	8%
Log Hauling / Trucking	4	9	8	20%
Barging / Towing	0	0	0	0%
Road Building	1	2	2	9%
Silviculture	43	69	47	21%
Other	0	0	0	0%
Total	54	92	70	20%

Chilcotin FD Survey Results - % of Employees by Residence Location	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	Chilcotin FD 3 Year Average
Quesnel FD				
Quesnel	0%	0%	0%	0%
Nazko & Surrounding Region	0%	0%	0%	0%
Sub-Total Quesnel FD	0%	0%	0%	0%
Central Cariboo FD				
Williams Lake	51%	53%	52%	52%
McLeese Lake/ Soda Creek	0%	0%	0%	0%
150 Mile House, Horsefly & Surrounding Region	2%	2%	3%	3%
Other Central Cariboo (Riske Creek)	3%	4%	4%	4%
Sub-Total Central Cariboo FD	57%	59%	59%	59%
Chilcotin FD				
Alexis Creek & Surrounding	29%	28%	29%	29%
Anahim Lake & Surrounding	2%	1%	1%	1%
Other Chilcotin FD	<u>2%</u>	<u>1%</u>	<u>0%</u>	<u>1%</u>
Sub-Total Chilcotin FD	33%	30%	31%	31%
Other BC Interior				
Prince George	1%	1%	1%	1%
Other	0%	0%	0%	0%
Sub-Total - Other BC Interior	1%	1%	1%	1%
Other (please specify):	9%	10%	8%	9%
Total	100%	100%	100%	100%

Chilcotin FD Survey Results - Person Years (PY) of Direct Harvesting Related Employment per 000 m3 of Timber Harvested	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	Chilcotin FD 3 Year Average
Harvesting/ Falling	0.106	0.105	0.110	0.107
Planning & Administration	0.030	0.023	0.025	0.025
Log Hauling / Trucking	0.071	0.076	0.077	0.075
Barging / Towing	0.000	0.000	0.000	0.000
Road Building	0.008	0.010	0.011	0.010
Silviculture	0.039	0.041	0.039	0.040
Other	0.000	0.000	0.000	0.000
Total	0.206	0.255	0.262	0.257
Direct Employment by Employee Residence				
Quesnel FD	0.000	0.000	0.000	0.000
Central Cariboo FD	0.117	0.150	0.156	0.151
Chilcotin FD	0.069	0.077	0.081	0.080
Other BC Interior	0.003	0.003	0.003	0.003
Lower Mainland and Other (mainly planting crews)	0.018	0.026	0.022	0.024
Total	0.206	0.255	0.262	0.257

Survey Coverage by Harvest Volume	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	Chilcotin FD 3 Year Average
Total Harvest Reported by MOFR	375,713	897,136	639,850	637,566
Reported Volume	334,362	673,025	519,858	509,082
Survey Coverage	89%	75%	81%	80%

Direct Employment Impacts (PY) from Central Cariboo Region Timber Harvest (Extrapolated to Total Industry)	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	Chilcotin FD 3 Year Average	3 Year Average % of Total
Direct Harvesting & Silviculture Employment by Employee Residence:					
Quesnel FD	0	0	0	0	0%
Central Cariboo FD	57	135	96	96	24%
Chilcotin FD	30	72	51	51	13%
Other BC Interior	1	3	2	2	1%
Lower Mainland and Other (mainly planting crews)	9	21	15	15	4%
Total Harvesting and Silviculture	97	231	165	164	41%
Processing Employment in Central Cariboo Region:					
Wood Products Processing	133	288	166	196	48%
Primary Pulp and Paper in CC Region	21	49	35	35	9%
Sub-Total	154	337	202	231	57%
Primary Processing Outside Central Cariboo Region	6	13	10	10	2%
Total BC Direct Impacts	256	582	376	405	100%
ASSUMPTIONS					
Total Timber Harvest (MOFR) (m3)	375,713	897,136	639,850	637,566	
Exports Based on Survey	0.0%	0.0%	0.0%	0.0%	
Volume Processed in BC (m3)	375,713	897,136	639,850	637,566	
BC Employment Coefficients (PY per 1,000 m3):					
Harvesting and Silviculture (3 Year Average from Survey)	0.257	0.257	0.257	0.257	39%
Primary Wood Products Processing in CC Region	0.354	0.321	0.260	0.331	50%
Primary Pulp and Paper in CC Region	0.055	0.055	0.055	0.055	8%
Primary Processing Outside CC Region	0.015	0.015	0.015	0.015	2%
Total - Direct Primary Impacts	0.681	0.648	0.587	0.658	100%

Survey Results - Timber Harvesting Characteristics	Chilcotin FD 2006	Chilcotin FD 2007	Chilcotin FD 2008	Chilcotin FD 3 Year Average
% Pine Leading Stands	96.8%	97.8%	92.3%	95.7%
% Conventional Ground Logging	100.0%	100.0%	100.0%	100.0%
% Cable Logging	0.0%	0.0%	0.0%	0.0%
% Helicopter Logging	0.0%	0.0%	0.0%	0.0%
Sub-Total	100.0%	100.0%	100.0%	100.0%
% Timber Affected by MPB	96.2%	97.4%	90.8%	94.9%
% Dead Wood (Beetle Killed)	93.0%	93.5%	84.7%	90.4%
% Usable for Solid Wood Products	96.8%	97.8%	92.3%	95.7%
% from Mountain Caribou Habitat	0.0%	0.0%	0.0%	0.0%

APPENDIX 4 COMBINED CENTRAL CARIBOO REGION SURVEY RESULTS

This appendix combines results for all 3 forest districts (Quesnel, Central Cariboo and Chilcotin) as well as TFL 52.

Central Cariboo Region Survey Results - Destination of Timber Harvest from the Central Cariboo Region	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	Central Cariboo Region 3 Yr Average
Total Reported Harvested Volumes (m3)	6,700,908	6,988,672	7,305,521	6,998,367
Proportion of Total Volumes Harvested:				
Export Volume	0.0%	0.0%	0.0%	0.0%
Quesnel FD	52.4%	57.5%	60.4%	51.6%
Central Cariboo FD	43.8%	36.3%	34.7%	41.8%
Chilcotin FD	1.4%	2.0%	0.1%	1.0%
Prince George TSA	2.1%	4.0%	4.5%	5.3%
Kamloops Forest District	0.1%	0.1%	0.1%	0.1%
Lillooet - Cascades FD	0.1%	0.1%	0.0%	0.0%
100 Mile House	<u>0.2%</u>	<u>0.2%</u>	<u>0.2%</u>	<u>0.2%</u>
TOTAL VOLUME	100.0%	100.0%	100.0%	100.0%
Central Cariboo Region Results - Harvesting Employment - Person Years (PY)	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	
Harvesting/ Falling	661	661	641	
Planning & Administration	154	164	158	
Log Hauling / Trucking	386	376	352	
Barging / Towing	1	1	0	
Road Building	41	49	53	
Silviculture	278	296	287	
Other	5	6	6	
Total	1,526	1,552	1,497	
Central Cariboo Region Results - Full Time Harvesting Employment	Full Time Jobs			
	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	
Harvesting/ Falling	626	640	630	
Planning & Administration	152	163	157	
Log Hauling / Trucking	377	368	348	
Barging / Towing	0	0	0	
Road Building	40	47	52	
Silviculture	120	133	138	
Other	0	0	0	
Total	1,314	1,352	1,325	
Central Cariboo Region Results - Part Time Employment	Part Time Jobs			
	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	
Harvesting/ Falling	69	67	44	
Planning & Administration	21	21	19	
Log Hauling / Trucking	48	49	33	
Barging / Towing	3	3	3	
Road Building	17	17	17	
Silviculture	681	679	627	
Other	80	89	92	
Total	918	922	833	

Central Cariboo Region Results - % of Employees by Residence Location (Part-Time Employees are Counted as PY)	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	Central Cariboo Region 3 Yr Average
Quesnel FD				
Quesnel	34%	34%	37%	35%
Nazko & Surrounding Region	3%	4%	4%	4%
Sub-Total Quesnel FD	37%	38%	41%	39%
Central Cariboo FD				
Williams Lake	44%	41%	39%	41%
McLeese Lake/ Soda Creek	7%	7%	7%	7%
Sub-Total Central Cariboo FD	51%	47%	45%	48%
Chilcotin FD				
Alexis Creek & Surrounding	2%	4%	3%	3%
Anahim Lake & Surrounding	0.2%	0.2%	0.2%	0.2%
Other Chilcotin FD	<u>0.1%</u>	<u>0.1%</u>	<u>0.0%</u>	<u>0.1%</u>
Sub-Total Chilcotin FD	2%	4%	3%	3%
Other BC Interior				
Prince George	0.4%	0.5%	0.6%	0.5%
Smithers	0.3%	0.3%	0.4%	0.3%
Sub-Total - Other BC Interior	1%	1%	1%	1%
Other (please specify):	9%	10%	9%	9%
Total	100%	100%	100%	100%

Central Cariboo Region Results - Person Years (PY) of Direct Harvesting Related Employment per 1,000 m3 of Timber Harvested	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	Central Cariboo Region 3 Yr Average
Harvesting/ Falling	0.099	0.095	0.088	0.094
Planning & Administration	0.023	0.024	0.022	0.023
Log Hauling / Trucking	0.058	0.054	0.048	0.053
Barging / Towing	0.000	0.000	0.000	0.000
Road Building	0.006	0.007	0.007	0.007
Silviculture	0.041	0.042	0.039	0.041
Other	0.001	0.001	0.001	0.001
Total	0.228	0.222	0.205	0.218
Direct Employment by Employee Residence				
Quesnel FD	0.084	0.084	0.084	0.084
Central Cariboo FD	0.116	0.105	0.093	0.104
Chilcotin FD	0.006	0.009	0.007	0.007
Other BC Interior	0.002	0.002	0.002	0.002
Lower Mainland and Other (mainly planting crews)	0.020	0.022	0.019	0.021
Total	0.228	0.222	0.205	0.218

Survey Coverage by Harvest Volume	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	Central Cariboo Region 3 Yr Average
Total Harvest Reported by MOF	9,055,391	8,808,149	8,851,874	8,905,138
Reported Volume	6,700,908	6,988,672	7,305,521	6,998,367
Survey Coverage	74%	79%	83%	79%

Direct Employment Impacts (PY) from Central Cariboo Region Timber Harvest (Extrapolated to Total Industry)	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	Central Cariboo Region 3 Yr Average	3 Year Average % of Total
Direct Harvesting & Silviculture Employment by Employee Residence:					
Quesnel FD	762	741	745	750	14%
Central Cariboo FD	945	919	923	929	17%
Chilcotin FD	65	63	64	64	1%
Other BC Interior	16	15	16	16	0%
Lower Mainland and Other (mainly planting crews)	186	181	181	183	3%
Total Harvesting and Silviculture	1,974	1,920	1,929	1,941	36%
Processing Employment in Central Cariboo Region:					
Wood Products Processing	3,206	2,827	2,301	2,778	52%
Primary Pulp and Paper in CC Region	498	484	487	490	9%
Sub-Total	3,704	3,312	2,788	3,268	61%
Primary Processing Outside Central Cariboo Region	136	132	133	134	3%
Total BC Direct Impacts	5,813	5,364	4,850	5,342	100%
ASSUMPTIONS					
Total Timber Harvest (MOFR) (m3)	9,055,391	8,808,149	8,851,874	8,905,138	
Exports Based on Survey	0.0%	0.0%	0.0%	0.0%	
Volume Processed in BC (m3)	9,055,391	8,808,149	8,851,874	8,905,138	
BC Employment Coefficients (PY per 1,000 m3):					
Harvesting and Silviculture (3 Year Average from Survey)	0.218	0.218	0.218	0.218	
Primary Wood Products Processing in CC Region	0.354	0.321	0.260	0.331	
Primary Pulp and Paper in CC Region	0.055	0.055	0.055	0.055	
Primary Processing Outside CC Region	0.015	0.015	0.015	0.015	
Total - Direct Primary Impacts	0.642	0.609	0.548	0.619	

Survey Results - Timber Harvesting Characteristics	Central Cariboo Region 2006	Central Cariboo Region 2007	Central Cariboo Region 2008	Central Cariboo Region 3 Yr Average
% Pine Leading Stands	90.0%	91.3%	90.5%	90.6%
% Conventional Ground Logging	99.7%	99.7%	99.8%	99.7%
% Cable Logging	0.3%	0.3%	0.2%	0.3%
% Helicopter Logging	0.0%	0.0%	0.0%	0.0%
Sub-Total	100.0%	100.0%	100.0%	100.0%
% Timber Affected by MPB	90.5%	91.9%	91.0%	91.1%
% Dead Wood (Beetle Killed)	85.7%	87.2%	86.2%	86.4%
% Usable for Solid Wood Products	94.8%	95.7%	95.1%	95.2%
% from Mountain Caribou Habitat	0.3%	0.2%	0.3%	0.3%

APPENDIX 5 LIST OF MANUFACTURING OPERATIONS, 2008

List of Primary Manufacturing Operations in Central Cariboo Region	Product	Division/Location	Annual Capacity
Quesnel FD		All in Quesnel unless stated otherwise	units
Lumber:			
Tolko Industries Ltd.	Lumber	Quest Wood Products Division	148 millions of board feet
Canadian Forest Products Ltd.	Lumber	'A' Mill - Quesnel Division	400 millions of board feet
West Fraser Mills Ltd.	Lumber		264 millions of board feet
C & C Wood Products Ltd.	Lumber		28 millions of board feet
M & K Sawmills	Lumber	Small operation	n/a
West Fraser Mills Ltd.	Lumber	Northstar Lumber	163 millions of board feet
Sub-Total - Lumber in Quesnel FD			1,003 millions of board feet
Log Home and Other:			
Reko Log Homes Ltd.	Log Home		
Pinnacle Pellet Inc.	Pellets	Pellet Operations	90 000's of tonnes
West Fraser Mills Ltd.	PLY	Veneer and Plywood Operations	179 million square feet, 3/8" basis
West Fraser Mills Ltd.	PNL	Westpine MDF Plant	340 million square feet, 3/8" basis
West Fraser Mills Ltd.	VNR	Veneer and Plywood Operations	106 million square feet, 3/8" basis
Central Cariboo FD		All in Williams Lake unless stated otherwise	
Lumber & Chipping Mills:			
Tolko Industries Ltd.	Lumber	Lumber Operations	200 millions of board feet
Tolko Industries Ltd.	Lumber	Lumber Operations	261 millions of board feet
Tolko Industries Ltd.	Lumber	Lumber Operations - Soda Creek	118 millions of board feet
West Fraser Mills Ltd.	Lumber	Lumber Operations	155 millions of board feet
Chimney Creek Lumber Co Ltd.	Lumber	Lumber Operations	2 millions of board feet
Wildwood Forest Products Ltd.	Lumber	Lumber Operations	2 millions of board feet
Linde Bros Lumber Ltd.	Lumber	Lumber Operations	7 millions of board feet
Sub-Total Lumber in Central Cariboo FD			745 millions of board feet
Log Home and Other:			
Pioneer Log Homes Ltd.	Log Home	Log Home Operations	
Wildwood Forest Products Ltd.	Log Home	Log Home Operations	
Pinnacle Pellet Inc.	Pellets	Pellet Operations	115 000's of tonnes
West Fraser Mills Ltd.	PLY	Veneer and Plywood Operations	193 million square feet, 3/8" basis
West Fraser Mills Ltd.	VNR	Veneer and Plywood Operations	127 million square feet, 3/8" basis
Tolko Industries Ltd.	Chipping	Chipping Operations - Soda Creek	56 000's BDU
Chilcotin FD			
Lumber Mills:			
West Chilcotin Forest Product Ltd.	Lumber		106 millions of board feet
Sigurdson Bros. Logging Company	Lumber	Alexis Creek	72 millions of board feet
Sigurdson Bros. Logging Company	Lumber	Nimpo Lake	72 millions of board feet
Sub-Total Lumber in Chilcotin FD			250 millions of board feet
Total Capacity for Lumber Mills in Central Cariboo Region			1,998 millions of board feet
Pulp and Paper Operations -			
Cariboo Pulp & Paper Co. Ltd.	Kraft Pulp	Quesnel - owned by West Fraser	329 000's tonnes
Quesnel River Pulp Co.	BCTMP	Quesnel - owned by West Fraser (Bleached Chemi-Thermo Mechanical Pulp)	336 000's tonnes
Total - Central Cariboo Region			666 000's tonnes

Note: The list includes M & K Sawmills which is not listed in the 2006 MOFR report on mill capacity. M & K Sawmills participated in the survey as one of the licensees and was operating in 2008.

Source: BC MOFR, *Major Primary Timber Processing Facilities in BC 2006*, August 2008.

APPENDIX 6 PRELIMINARY LIST OF KEY REFERENCES

BC Ministry of Forests and Range, *Major Primary Timber Processing Facilities in BC 2006*, August 2008, 45 pages, available from:
<http://www.for.gov.bc.ca/>

BC Ministry of Forests and Range, *Forest Investment Account (FIA). Forest Investment Account Land Base Investment Program, 2006/07 Annual Update*, 8 pages; available from:
http://www.for.gov.bc.ca/hcp/fia/FIA_Annual_Update_200607.pdf

BC MOFR, *Williams Lake Timber Supply Area, Rationale for Allowable Annual Cut (AAC) Determination*, Effective April 18, 2007.

BC MOF, *Quesnel Timber Supply Area Socio-Economic Analysis*, March 1995.

BC MOF, *Williams Lake Timber Supply Area Socio-Economic Analysis*, March 1995.

BC MOF, *Quesnel Timber Supply Area Analysis Report and Information for Urgent Allowable Annual Cut (AAC) Increase*, February 2001, page iv.

Cariboo-Chilcotin Beetle Action Coalition (Mike Carlson, contractor), *Forest Sector Strategy*, November 2007, 50 pages, available from: <http://www.c-cbac.com/Documents/>

Horne, Dr. Garry, *British Columbia's Heartlands at the Dawn of the 21st Century, 2001 Economic Dependencies and Impact Ratios for 63 Local Areas*, BC Stats, B.C. Ministry of Management Services, 2004, 105 pages, available from:
http://www.bcstats.gov.bc.ca/pubs/econ_dep/ed_full.pdf

Pierce Lefebvre Consulting, *Prince George TSA Region Timber Harvest & Employment Survey*, 2008, 50 pages, available from: <http://www.for.gov.bc.ca/>

Pierce Lefebvre Consulting, *Kootenay Region Timber Harvest & Employment Survey*, 2008, 44 pages, available from:
<http://www.for.gov.bc.ca/>

Valdal, Eric (BC MAL), Steven F. Wilson (Ecologic Research) and Jeff Stone (BC MOFR), *The BC Species at Risk Coordination Office's Draft Mountain Caribou Recovery Strategy: Analysis of Habitat Options for Forest Industry Stakeholders*; Prepared for the BC Species at Risk Coordination Office; March 2007, 65 pages, available from:
http://ilmbwww.gov.bc.ca/sarco/mc/files/SaRCO_caribou_habitat_options_analysis_20070314.pdf