Mid-term Timber Supply Socio-economic Analysis

(DRAFT)

This information note examines the socio-economic implications of the timber supply in select mountain pine beetle areas and is intended for the use of the mid-term timber supply project steering committee and planning team as information in its reporting and decision making. The information focuses on the Lakes TSA portion of the Nadina forest district, the Vanderhoof, Fort St. James, Prince George, Quesnel, Central Cariboo and Chilcotin forest districts.

The report is divided into four sections:

- section 1 provides a short profile outlining the population and various forest sector dependencies;
- section 2 provides information about past, current and expected future timber supplies in the study area;
- section 3 provides information about the processing sector; and
- section 4 outlines the employment related effects of the timber supply scenarios.

Local area profile:

Table 1 provides population levels for five time periods. The data are for local health areas given their close approximation to forest districts.

Table 1: Population by local health area, 2000-2020.

Local Health Area	2000	2005	2010	2015	2020	Change 2000-10	Change 2010-20
Cariboo - Chilcotin	28,628	26,347	26,805	27,451	27,931	-6%	4%
Quesnel	25,640	23,085	23,784	23,997	24,353	-7%	2%
Burns Lake	7,624	7,750	7,960	7,970	7,918	4%	-1%
Nechako	17,072	15,657	15,009	15,417	15,594	-12%	4%
Prince George	100,789	95,663	97,036	98,822	99,936	-4%	3%

Source: BCStats http://www.bcstats.gov.bc.ca/data/pop/pop/popproj.asp

Table 2 provides an indication of the level of forest sector dependency within the MPB districts. These districts also have high vulnerability indices (Table 3) which suggest that their economies would be more vulnerable if a reduction in forest sector activity occurs.

Table 2: Economic dependency, by forest district and sector, 2006.

Forest District	Forestry	Mining & Min Proc	Agric. & Food	Tourism	High Tech	Public Sector	Const	Other
Fort St. James	49%	1%	3%	6%	0%	36%	2%	3%
Nadina	46%	3%	5%	11%	0%	29%	5%	1%
Prince George	26%	3%	2%	9%	2%	38%	10%	10%
Vanderhoof	45%	6%	7%	8%	0%	27%	4%	2%
Central Cariboo	32%	8%	6%	9%	0%	33%	9%	4%
Chilcotin	26%	0%	21%	11%	1%	34%	6%	1%
Quesnel	48%	2%	5%	8%	0%	27%	7%	3%

Source: Horne, Garry (2009) 2006 Economic Dependency
Tables for Forest Districts, February 2009. Victoria, BCStats.

Table 3: Basic sector diversity and forest sector[1]
Vulnerability for selected forest districts, 2006.

	Diversity	**Forest Vulnerability**
Forest district		
Nadina	55	100
Prince George	68	39
Fort St. James	48	132
Vanderhoof	60	79
Quesnel	55	104
Central Cariboo	66	51
Mackenzie (lowest diversity/highest vulnerability)	28	264
100 Mile House	70	35
Kamloops	74	11
Chilliwack (lowest vulnerability)	73	3
Rocky Mountain (highest diversity)	77	12
Provincial forest district average	67	43

Source: Horne, Garry (2009) 2006 Economic Dependency
Tables for Forest Districts, February 2009. Victoria, BCStats.
Note: highest, lowest references refer to provincial standing.

[1] Diversity measures how dependent a forest district is on each of its sectors. An index of 100 indicates that the forest district depends equally on each sector for its income. Thus, the higher the number the more diverse the economy and the more it can rely on other sectors in times of sectoral downturns. The forest vulnerability index is based on the dependency and diversity data. A higher number indicates that when the forest sector experiences a downturn, the communities are more likely to experience greater economic difficulties that other areas with lower scores. None of these indicators suggest that a particular district is any more likely to experience reductions in forestry activity; the data helps understand which forest districts may experience greater difficulty if or when a downturn occurs.

Forest sector and timber supply

Allowable annual cut and timber supply:

Tables 4 to 6 show the level of AAC, future timber supply and percentage change by management unit and specific regions.

Table 4: Allowable annual cut and timber supply estimates by specific management unit.

Management unit	Pre-uplift AAC 2000 (m^3)	Peak study area AAC[2] 2007 (m^3)	2011 AAC (m^3)	2020 (m^3)	2030+ (m^3)
Lakes TSA	1,462,000	3,162,000	2,000,000	500,000	500,000
Prince George TSA	9,363,661	14,944,000	12,500,000	12,500,000	6,300,000
Quesnel TSA	2,320,000	5,280,000	4,000,000	1,100,000	1,100,000
Williams Lake TSA[1]	3,807,000	5,770,000	5,770,000	5,770,000	1,867,000
Canfor TFL 30	350,000	330,000	330,000	330,000	330,000
Tanizul CFA	120,000	154,112	152,672	80,000	80,000
West Fraser TFL 52	661,800	870,000	1,000,000	720,000	720,000
Dunkley TFL 53	239,500	880,000	219,000	219,000	219,000
Total TSA/TFL	18,323,961	31,390,112	25,971,672	21,219,000	11,116,000

Source: FLNRO, Timber Pricing Branch, Forest Analysis and Inventory Branch, Nadina, Prince George, Quesnel, and Central Cariboo Forest Districts.

Notes: 1. The Williams Lake TSA had its first MPB related uplift in 1985, followed by partitions to address western supply block issues, access to deciduous species, and problem forest types. Since 1985, the TSA's AAC has ranged from 3.75 million cubic metres to just over 4 million cubic metres. In 1996 the AAC was set at 3.8 million cubic metres.
2. The year 2007 had the highest combined AAC, although not the highest for some particular districts.

Table 5 combines the individual management unit AACs into a more regional fibre basket agglomeration. About 95% of the timber harvested within the study region is scaled within the study region.

Table 5: Allowable annual cut and timber supply estimates by select regions.

Management unit	Pre-uplift AAC 2000 (m3/yr)	Peak study area AAC 2007 (m3/yr)	2011 AAC (m3/yr)	No mitigation 2020 (m3/yr)	No mitigaton 2030+ (m3/yr)	Mitigation incremental volume (m3/yr)
Nadina FD (Lakes TSA portion)	1,462,000	3,162,000	2,000,000	500,000	500,000	100,000
Prince George TSA/TFL	10,073,161	16,308,112	13,201,672	13,129,000	6,929,000	2,276,000
Quesnel TSA/TFL	2,981,800	6,150,000	5,000,000	1,820,000	1,820,000	400,000
Williams Lake TSA	3,807,000	5,770,000	5,770,000	5,770,000	1,900,000	1,183,000
Total TSA/TFL	18,323,961	31,390,112	25,971,672	21,219,000	11,149,000	3,959,000

Source: FLNRO, Timber Pricing Branch, Forest Analysis and Inventory Branch, Nadina, Prince George, Quesnel, and Central Cariboo Forest Districts.

Table 6: Percent change in timber supply/AAC from pre-uplift AAC.

Management unit	Pre-uplift AAC 2000 (m3/yr)	Peak AAC % change from pre-MPB (m3/yr)	2011 % change from pre-MPB	2020 % change from pre-MPB	2030 % change from pre-MPB	Mitigation % change from pre-MPB
Nadina FD (Lakes TSA portion)	1,462,000	116%	37%	-66%	-66%	-59%
Prince George TSA/TFL	10,073,161	62%	31%	30%	-31%	-9%
Quesnel TSA/TFL	2,981,800	106%	68%	-39%	-39%	-26%
Williams Lake TSA	3,807,000	52%	52%	52%	-50%	-19%
Total TSA/TFL	18,323,961	71%	42%	16%	-39%	-18%

Table 7 provides estimates of the chip supply for local pulp mills and the availability of sawdust/shavings for the pulp, pellet, energy and other markets. These data include chip volumes from the Williams Lake TSA. The Williams Lake Capital Power LP power plant has been a large consumer of residual chips using on average about 600 thousand green tonnes per year, or about 300 thousand BDUs (assuming 50% green tonne moisture content). The power plant has more recently been accessing other sources of fibre for its facility, including standing timber.

Table 7: Residual chip and sawdust/shavings supply.

	2000	Peak harvest 2005/06	2009	No mitigation 2020	No mitigaton 2030+	2020+ Mitigation incremental change	Total 2020+
Residual chip supply (BDUs)	2,981	3,724	2,127	2,779	1,456	363	1,818
Sawdust ahd shavings supply (BDUs)	1,160	1,626	1,106	1,157	606	151	757

Processing facilities:

Table 8 indicates the number of mills who participated in the 2000-2009 FLNRO annual mill survey in the study region. Fluctuations are often the result of smaller mills entering and exiting the market; however, in the latter part of the decade larger mill closures did occur. An assessment of which mills and mill types have closed either permanently or temporarily has not been undertaken for this analysis and is not reflected in this table.

Table 8: Number of mills of any type located and operating within the study region, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Lakes TSA region	3	3	3	4	4	5	5	6	6	3
Prince George TSA/TFL region	26	27	29	29	28	29	33	35	35	22
Quesnel TSA/TFL region	13	13	13	13	13	13	13	12	12	10
Williams Lake TSA region	11	15	15	13	14	15	16	16	15	11
Total study region	53	58	60	59	59	62	67	69	68	46

FLNRO Annual mill survey of processing facilities in B.C.

Table 9 uses the timber and chip supply data together with average feedstock consumption for mills operating within the study area. The number of mills supported by the future timber supply is calculated using a simple regional average mill input. If larger capacity sawmills were the focus of future milling activity, fewer mills would be in operation than indicated in the table, although production volumes may not change. The number of pulp mills operating in future may also be more dependent on the capacities and efficiencies at individual mills, thus the number indicated in the table may be lower.

Table 9: Average harvest, mill input and number of mills operating in the study area, for select times.

	Average 2000-09	No mitigation 2020	No mitigaton 2030+	2020+ Mitigation	2030+ Mitigation
Average harvest/timber supply ('000m^3/yr)	23,365	21,499	11,396	24,270	14,167
Average no. of sawmills	29	29	14	30	18
Average sawmill consumption ('000m^3/yr)	797	734	797	797	797
Average no. of pulpmills	5	5	2.6	5	3.2
Average pulp mill consumption ('000 BDUs/yr)	627	611	627	627	627

Table 10 lists the mills supported by the timber supply in 2009, by forest district and mill type. The purpose of this table is to provide a sense of where mills are located and their size of operation.

Table10: List of mills in the study region and production capacity, 2009.

Forest district	Product	Company	Location of mill	Annual output capacity 2009	Capacity units
Central Cariboo					
	Chip	Tolko Industries Ltd.	Williams Lake	64	000 BDUs
	Lumber	Tolko Industries Ltd. Creekside	Williams Lake	254	MMfbm
		Tolko Industries Ltd. Lakeview	Williams Lake	254	MMfbm
		Tolko Industries Ltd. Soda Creek	Williams Lake	164	MMfbm
		West Fraser Mills Ltd.	Williams Lake	161	MMfbm
	Pellet	Pinnacle Renewable Engergy Group	Williams Lake	169	000 tonnes
	Plywood	West Fraser Mills Ltd.	Williams Lake	194	MM ft^2
	Veneer	West Fraser Mills Ltd.	Williams Lake	120	MM ft^2
Chilcotin					
	Lumber	West Chilcotin Forest Products Ltd.	Anahim lake	115	MMfbm
Fort St James					
	Lumber	Apollo Forest Products Ltd.	Fort St. James	151	MMfbm
		Conifex - Stuart Lake Lumber	Fort St. James	132	MMfbm
Nadina (Lakes portion)					
	Lumber	Hampton Affiliates - Babine	Burns Lake	320	MMfbm
		Hampton Affiliates - Decker Lake	Burns Lake	43	MMfbm
		Cheslatta Forest Products Ltd.	Ootsa Lake	72	MMfbm
	Pellet	Pacific Flame - Tahtsa Pellets	Burns Lake	40	000 tonnes
		Pinnacle Renewable Energy Group	Burns Lake	400	000 tonnes
Prince George					
	Lumber	Canadian Forest Products Ltd.	Isle Pierre	230	MMfbm
		Canadian Forest Products Ltd.	Bear Lake	132	MMfbm
		Canadian Forest Products Ltd.	Prince George	269	MMfbm
		Canadian Forest Products Ltd.	Prince George	261	MMfbm
		Carrier Lumber Ltd.	Prince George	312	MMfbm
		Dunkley Lumber Ltd.	Strathnaver	576	MMfbm
		Lakeland Mills Ltd.	Prince George	154	MMfbm
	Pulp	Canadian Forest Products Ltd. (Northwood)	Prince George	550	000 tonnes
		Canadian Forest Products Ltd. (Intercon Div.)	Prince George	300	000 tonnes
		Canadian Forest Products Ltd. (PG P&P)	Prince George	150	000 tonnes
	Pellet	Pacific BioEnergy	Prince George	186	000 tonnes
		Pinnacle Renewable Energy Group	Strathnaver	240	000 tonnes
	Paper	Canadian Forest Products Ltd.	Prince George	128	000 tonnes
Quesnel					
	Lumber	Canadian Forest Products Ltd.	Quesnel	120	MMfbm
		Tolko Industries Ltd.	Quesnel	144	MMfbm
		West Fraser Mills Ltd.	Quesnel	384	MMfbm
	Pulp	Cariboo Pulp & Paper Co. Ltd.	Quesnel	328	000 tonnes
		Quesnel River Pulp Company	Quesnel	279	000 tonnes
	Pellet	Pinnacle Renewable Energy Group	Quesnel	88	000 tonnes
	Plywood	West Fraser Mills Ltd.	Quesnel	212	MM ft^2
	Panel	West Fraser Mills Ltd.	Quesnel	231	MM ft^2
	Veneer	West Fraser Mills Ltd.	Quesnel	144	MM ft^2
Vanderhoof					
	Lumber	Canadian Forest Products Ltd.	Engen	442	MMfbm
		L & M Lumber Ltd.	Vanderhoof	191	MMfbm
		West Fraser Mills Ltd.	Fraser Lake	260	MMfbm
	Pellet	Premium Pellet Ltd.	Vanderhoof	105	000 tonnes

Source: Major primary timber processing facilities in BC (2009 Edition) http://www.for.gov.bc.ca/het/fibre.htm

Socio-economic impacts:

Tables 11 through 14 provide estimates of employment levels (in person years) that could be supported by the timber supply. The term 'supported' is used to indicate that any particular estimate may not reflect the exact level of employment in any year, but based on a survey of employers it reflects the average employed. Fibre flowing into the region will also support local employment; however, these jobs are not included in this analysis. When examining change, the focus is not necessarily on exact numbers, but on magnitudes of change.

Employment is reported in person years (PYs). Person years are used to standardize both part-time and full-time jobs. Using PYs eliminates the problem of accounting for part-time jobs over time and the variation in the duration of these jobs in any year. This method allows the comparison of alternative scenarios. A person year, or a full-time job, is assumed to be at least 180 days in duration. In general, processing PYs are more likely to last at least 180 days (at least for larger mills in normal operating environments), thus will equate quite closely with actual employment. Harvesting and silviculture jobs are often part-time lasting for a few weeks to several months. The actual number of jobs would likely be higher than the PY estimate as a result.

Estimates are provided for direct harvesting and silviculture activities, direct processing including solid wood and pulp manufacturing, indirect and induced employment supported by business and employee spending, and a final total employment table.

The tables provide estimates showing the level of employment supported by the AAC in the year 2000 (the actual harvest in 2000 was slightly higher than the AAC), followed by the peak AAC and the peak harvest, then finally the timber supply forecasts and mitigation levels. The three initial points in time were chosen to show,

(1) the level of employment supported by the forest sector prior to the uplifts associated with this most recent MPB infestation,
(2) the maximum timber supply companies could access during the AAC uplift period, and
(3) the peak harvest rate during that uplift period, indicating the capacity of industry to use the full AAC.

The peak harvest rate was chosen as a better indication of the capacity industry was gaining to use the full AAC and the impact of the MPB uplifts, compared to an average harvest rate that includes significantly lower volumes from 2007 to 2010 as a result of the US housing crisis and ensuing recession. Readers can choose to compare which point in time they consider relevant.

Table 11: **Direct harvesting and silviculture** employment, in person years.

	2000 pre-uplift	Peak AAC 2007-09	Peak harvest 2005-06	No mitigation 2020	No mitigaton 2030+	2020+ Mitigation incremental change	Total 2020+ timber supply/PYs
Regional AAC/timber supply (m3/yr)	18,324	30,992	27,156	21,219	11,116	3,959	15,075
Harvesting employment (PYs)							
Lakes TSA region	468	816	516	129	129	26	155
Prince George TSA/TFL region	2,921	4,122	4,070	3,387	1,788	587	2,375
Quesnel TSA/TFL region	596	1,175	937	344	344	76	420
Williams Lake TSA region	1,028	1,500	1,151	1,500	494	308	802
Total study area person years	5,013	7,613	6,673	5,360	2,755	996	3,751

Table 12: **Direct processing** employment associated with past, current and future timber supplies, in person years.

	2000 pre-uplift	Peak AAC 2007-09	Peak harvest 2005-06	No mitigation 2020	No mitigaton 2030+	2020+ Mitigation incremental change	Total 2020+ timber supply/PYs
Regional AAC/timber supply (m3)	18,324	30,992	27,156	21,219	11,116	3,959	15,075
Processing employment (PYs)							
Lakes TSA region	658	1,151	728	182	182	36	218
Prince George TSA/TFL region	5,137	5,528	5,458	4,543	2,397	787	3,185
Quesnel TSA/TFL region	1,551	2,635	2,102	772	772	170	941
Williams Lake TSA region	2,056	2,198	1,686	2,198	724	451	1,175
Total study area person years	9,402	11,513	9,974	7,695	4,075	1,444	5,519

Table 13: **Indirect and induced** forest sector employment, in person years.

	2000 pre-uplift	Peak AAC 2007-09	Peak harvest 2005-06	No mitigation 2020	No mitigaton 2030+	2020+ Mitigation incremental change	Total 2020+ timber supply/PYs
Regional AAC/timber supply (m3)	18,324	30,992	27,156	21,219	11,116	3,959	15,075
Indirect/Induced employment (PYs)							
Lakes TSA region	446	779	493	123	123	25	148
Prince George TSA/TFL region	5,315	6,140	6,061	5,045	2,663	541	3,203
Quesnel TSA/TFL region	1,174	2,048	1,633	600	600	132	731
Williams Lake TSA region	1,542	1,801	1,381	1,801	593	385	979
Total study area person years	8,476	10,768	9,569	7,569	3,979	1,082	5,061

Table 14: **Total** (direct + indirect + induced) forest sector related employment, in person years.

	2000 pre-uplift	Peak AAC 2007-09	Peak harvest 2005-06	No mitigation 2020	No mitigaton 2030+	2020+ Mitigation incremental change	Total 2020+ timber supply/PYs
Regional AAC/timber supply (m3)	18,324	30,992	27,156	21,219	11,116	3,959	15,075
Total employment (PYs)							
Lakes TSA region	1,572	2,746	1,737	434	434	87	521
Prince George TSA/TFL region	13,373	15,790	15,588	12,975	6,848	1,915	8,763
Quesnel TSA/TFL region	3,321	5,858	4,672	1,715	1,715	377	2,092
Williams Lake TSA region	4,626	5,500	4,218	5,500	1,811	1,144	2,955
Total study area person years	22,891	29,893	26,216	20,624	10,808	3,523	14,331

Additional assumptions inherent in this type of analysis include the following:

- Direct PY estimates are calculated using employment coefficients (PYs/1000 cubic metres) based on three year average rates of employment and harvest or mill throughput. This method results in a linear relationship between PYs and the level of harvest, such that thresholds, for example reducing or adding a third shift, may not be reflected accurately at a specific point in time. Over time however, the coefficients provide reasonable estimates of employment supported by a particular harvest rate.
- From 2000 to 2010, the direct PY coefficients have declined, reflecting the increasing productivity and efficiency gains of industry. Person-year coefficients are based on surveys of licensees and processing facilities, thus reflect the accuracy and response rate of industry, and the assumption of the number of work days that constitute a person year. A person-year is generally assumed to be at least 180 days per year.

	harvesting	processing
Lakes TSA region	0.32-0.26	0.45-0.36
Prince George TSA/TFL region	0.29-0.26	0.51-0.35
Quesnel TSA/TFL region	0.20-0.19	0.52-0.42
Williams Lake TSA region	0.27-0.26	0.54-0.38

  For more information on the survey and calculation of these coefficients see the "other report" section at http://www.for.gov.bc.ca/het/fibre.htm
- Employment multipliers are used to calculate indirect and induced employment. Indirect employment is the result of a direct company spending its revenue on goods and services. Induced employment is the result of employees spending their income on consumer goods and services. The employment multipliers used in this analysis are shorter-term no migration multipliers reflecting the existence of a social safety-net, such as employment insurance and welfare. As a result, the level of spending within the community will not decline as if the workers were to permanently leave the area. For more information see http://www.bcstats.gov.bc.ca/pubs/econ_dep.asp
- The use of PY coefficients and employment multipliers is a static exercise and assumes that the current forest industry structure (mill and fibre use configurations) will remain the same as it is today. Given the emergence of alternative bio-economy opportunities, competition from other jurisdictions and technological developments, the way we use our forests will undoubtedly differ in future.