

KISPIOX TIMBER SUPPLY AREA

TIMBER SUPPLY REVIEW III

SOCIO-ECONOMIC ANALYSIS

Version 3.2

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1.0 Introduction

The impact of timber supply adjustments on local communities and the provincial economy is an important consideration in the Chief Forester's allowable annual cut (AAC) determination. This socio-economic assessment compares the employment and economic activity presently supported by the Kispiox Timber Supply Area (TSA) harvest to the level expected, given the base case timber supply forecast and other considerations. To make this comparison, a clear understanding of the TSA's current economic contribution to TSA communities and the province is required.

This report includes:

- An overview of the Kispiox TSA's demographic and social characteristics, a description of its main communities and the main economic drivers;
- A survey of the forest industry active in the Kispiox TSA forest industry, recent trends, and the contribution of the TSA's timber supply; and
- An analysis of the socio-economic implications of the base case harvest forecasts.

2.0 TSA Profile

2.1 Overview

The Kispiox TSA covers an area of about 1.22 million hectares in the northwest portion of the province. The topography is varied, with several mountain ranges, broad valleys, and a number of major river systems including the Kispiox, Skeena, Bulkley, Babine and Cranberry Rivers. It is sparsely populated. The largest community is the District of New Hazelton. Other settlements include Hazelton, South Hazelton and a number of Gitksan, Gitanyow and Wet'suwet'en communities¹. The region is well served by highway and rail links to offshore and North American destinations (Figure 1).

The traditional territories of three First Nations are recognized in the TSA geography. The **Gitksan's** traditional territory spans the upper reaches of the Skeena and Nass Rivers. The nation includes Gitanmaax Band Council, Gitwangak Band Council, Kispiox Band Council, Gitsegukla Indian Band and Glen Vowell Indian Band, which are located within a 40 km radius of Hazelton. **Gitanyow's** traditional territory spans the middle reaches of the Nass River. The community of Gitanyow, also known as Kitwancool, is located 20 km north of Kitwanga. The **Wet'suwe'ten** traditional territory covers the Bulkley River drainage area, east of Hazelton. The three First Nations are in the BC Treaty Process, at Stage 4².

The dominant economic tree species in the TSA are western hemlock and balsam (sub-alpine fir). Spruce, lodgepole pine, western red cedar, amabilis fir, birch, aspen and cottonwood are also found in the TSA. In addition, forest sites in the Hazeltons and Kispiox and Kitwanga valleys are important for commercial pine mushroom harvesting. About 57% of the TSA land base is considered productive forest land managed by the BC Forest Service. The TSA is administered from the Skeena Stikine Forest District office in Smithers.

¹Gitwangak, Gitanyow, Kispiox, Gitanmaax and Gitsegukla, are some of the larger communities.

² Stage 4 is described as the beginning of substantive negotiations where the goal is to reach agreement on each topic that will form the basis of a treaty.

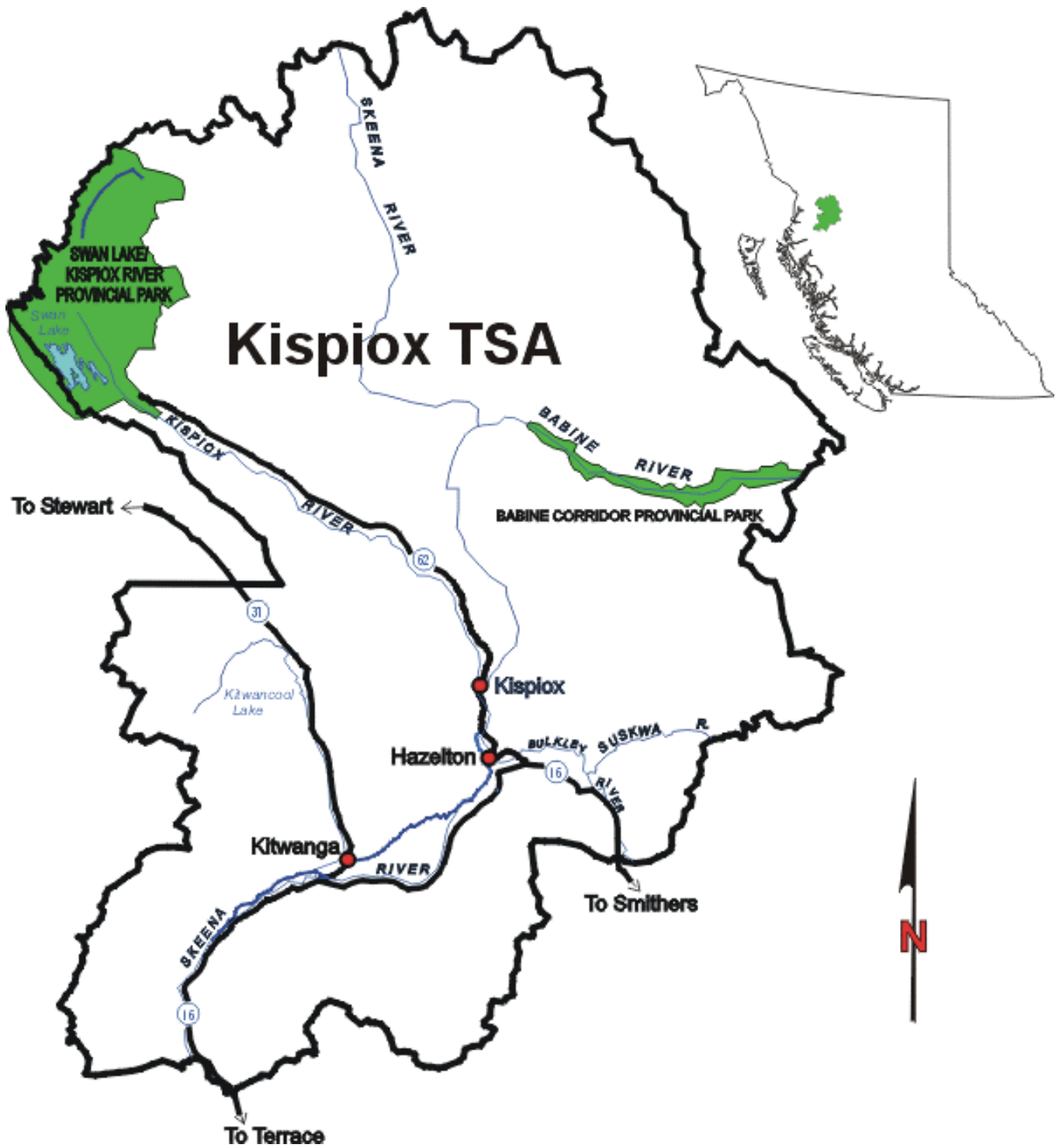


Figure 1: Map of Kispiox TSA (BC Ministry of Forests, 2000)

2.2 Population Trends and Socio-Economic Indicators

The total population of the TSA is around 6,000 persons. Most of the population resides in the Electoral Area “B” of the Regional District of Kitimat-Stikine, and a number of Gitksan, Gitanyow and Wet’suwet’en communities. The District of New Hazelton is the principal commercial, administrative and retail centre for the area. Hazelton, South Hazelton and Kitwanga are the TSA’s other main settlements. The best available Census information is becoming dated. Between the two most recent Census periods, the total population declined about 4% (Table 1). Since 2001, data indicates the TSA population has increased slightly³.

Table 1: Population Trends in the Kispiox TSA

Population Centre	1996	2001	% Change
Community			
Hazelton (Village)	347	345	-1%
New Hazelton (District Municipality)	822	750	-9%
Kitimat/Stikine B	2,098	1,948	-7%
Indian Reserves			
Gitanyow 1	408	369	-10%
Gitwangak 1 (Kitwanga)	481	475	-1%
Gitsegukla 1	506	432	-15%
Kispiox 1	553	651	18%
Hagwilget 1	262	237	-10%
Gitanmaax 1	638	693	9%
Sik-e-dakh 2 (Glen Vowel)	177	171	-3%
Total TSA	6,292	6,071	-4%

Source: Statistics Canada Community Profiles

The opinion of local officials is that the region’s population has probably been stable since the last Census, but that does not necessarily imply conditions are unchanging. For instance, many of the skilled trade persons that lost employment when the local lumber mills closed, are now working outside the region while maintaining their households in the Hazeltons. Where people have left the community, the vacated residence may be purchased by existing residents, which may ultimately create a vacancy in a First Nation community and an opportunity for a member to return to the community.

³ According to BC Stats population estimates, the Upper Skeena Local Health Area, which includes most of the TSA’s larger settlements, increased from 5,640 in 2001 to 5,735 in 2004 (a 1.6% increase).

The forecast of future population growth prepared by BC Stats is based primarily on the age of the current population, fertility rates and assumptions regarding migration. In small populations, such as this TSA, the forecast can be quite sensitive to small changes in the assumptions. Nevertheless, the expectation is that the TSA's population will increase over the next twenty years, but at a pace below the provincial average (Table 2).

Table 2: Forecast of Skeena LHA Population

Year	2004	2004 - 2014	2014 - 2024	2024
	Persons	Average Growth Rate For Period		Persons
Upper Skeena LHA	5,735	7.8%	5%	6,475
BC		12%	11%	

Source: BC Stats, PEOPLE 30

BC Stats also computes a “hardship index” for most regions of the province, including the Upper Skeena Local Health Area (LHA). This LHA includes all of the TSA's significant settlements and rural areas. The hardship index is a composite of several social and economic statistics, addressing such areas as economic hardship, crime, youth, and measures of children at risk. The index does not tell us why a region is doing well or poorly, but rather identifies areas where social stress may be high. The indices for the Upper Skeena LHA and adjacent LHA's are presented in Table 3. The indices of social conditions show that the Hazelton area is ranked very low across all categories, indicating difficult economic and social conditions for its residents.

Table 3: Index of Social Conditions for the Hazelton Area and Adjacent Regions (LHA)⁴

Year	Forestry	Mining	Agriculture and Fishing	Tourism	Public	Other Basic Sectors	Transfers and Other Non- Employment Income
2001	28	2	2	2	34	3	29
1996	36	2	3	7	35	5	13
1991	39	0	3	3	20	12	22

(Comparative LHA Rankings out 78, provincial average is 39)

The difficult social conditions were confirmed by discussions with local representatives.

2.3 Economic Profile

The economic profile is comprised of Census data and anecdotal information since the 2001 Census.

First, it is helpful to identify those activities that might be considered the TSA's basic sectors. A basic sector, by definition, brings revenue into the TSA. Examples of basic sector activities include the sale of goods and services “exported” from the TSA (e.g. the sale of lumber), income to public sector workers not paid by local taxes, and visitors (i.e. tourists) purchases. This “new”

⁴ Upper Skeena LHA

revenue is then paid to local suppliers, employees and company profits, which when re-spent locally create additional employment and economic activity (termed dependent activity). BC Stats uses Census information to construct the local economy, identifying the basic activity and the associated dependent activity.

For example, at the 2001 Census there were 659 persons directly employed in the forestry sector, in harvesting, silviculture, and saw milling. Spending by forest companies and their employees created employment for 198 additional persons in trucking, retail sales and the like. In total, the forest sector supported employment of 857 persons, or almost 30% of all jobs in the TSA. The after-tax income associated with this employment was some \$23 million or about 28% of the TSA total after tax income. The percentage contribution of the key basic sectors to employment and income is summarized in Figure 2. The Public Sector (education, health, safety, and government administration) accounts directly and indirectly for the largest share of employment. Other includes construction, and unallocated. Non-Employment income includes pension income and transfer payments⁵. No direct employment is associated with this activity.

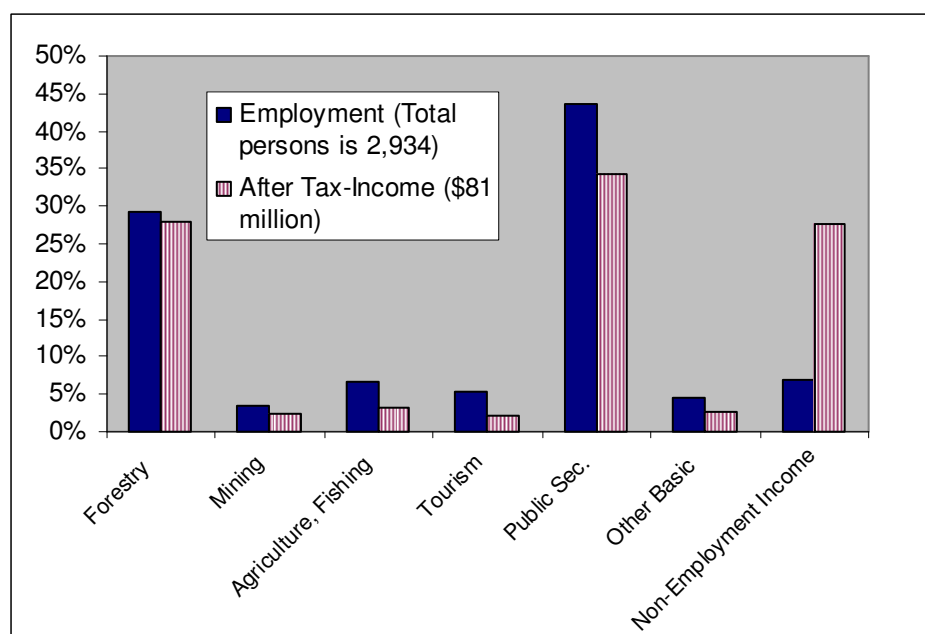


Figure 2: Employment and Income Contributions by Basis Sector (2001)

Since 2001, job losses have occurred in both the Forest and the Public sectors, from mill closures, closure of public offices, and the like. Given that these two sectors accounted for nearly 75% of total employment in 2001, the loss has been apparent in the TSA's economy.

Table 4 summarizes the trends in main economic drivers for the Hazelton area economy and trends in relative contributions over the past three Census periods.

⁵ Examples of transfer payments are welfare payments, Old Age Security pensions, Guaranteed Income Supplements, Canada Pension Plan, Employment Insurance benefits, Federal Child Tax benefits.

Table 4: Percentage Distribution Basic Income in the Hazelton Area

Year	Forestry	Mining	Agriculture	Tourism	Public	Transfers	Other Sectors
2001	28	2	1	2	34	28	33
1996	36	2	1	7	35	10	10
1991	39	0	2	3	20	13	22

Source: BC Heartland at the Dawn of the 21 Century, Appendix D for dependency data, Appendix E for geography

Forestry (harvesting, wood processing) has traditionally been the largest contributor to the local economy, but its relative contribution has been declining over the last three Census periods. It is suspected that the results of the 2006 Census will show the trend continuing, due to the sharp reduction in forest industry activity since 2001 (discussed in next section). In 2001, the Public sector (e.g. government, schools, health, etc) accounted for the largest share of basic income. With the transfer of several government offices, this portion has probably declined relative to its 2001 value.

The contribution of Transfer Payments increased sharply at the last Census. The expectation is, given the difficult circumstances the region has experienced since 2001 that the relative income share of Transfer Payments has increased.

Tourism is primarily a rubber tire trade of persons passing through. Its contribution has probably held steady since the last Census.

Agriculture and mining make relatively minor contributions. Since the Census, there has been a sharp increase in mineral development activity along Highway 37 north of the Hazeltons. Local businesses and individuals may have benefited from this. Agriculture is primarily beef production.

It could be the case that the Forest Sector continues to be a large contributor to the local economy, while the role of the TSA's forest resource has diminished. Specifically, anecdotal information is that many of the forest industry tradesmen, with the closure of local mills, have taken out-of-town work. There are numerous opportunities east of Smithers (involved in harvesting/processing beetle wood), or in the oil and gas industry in the Peace River region. This would contrast with pre-2001 when most of the forest sector jobs were related to timber harvest from the Kispiox TSA.

With respect to other measures of economic performance, the TSA's average annual income was \$22,700 in 2001 compared to a provincial average of \$31,500. Average employment incomes range from a high of \$31,500 in Hazelton to \$8,600 in Gitwangak 1 (2001 Census).

Unemployment rates varied by community, from a low of 18% in the Village of Hazelton, to almost 60% in the Gitsegukla 1 reserve. The provincial average was 8.5%.

With respect to future prospects, the re-opening of the pulp mill in Prince Rupert is a near term prospect that would greatly enhance the prospects for local forest industry. The tourism industry is expected to continue growing, perhaps benefiting from the expanding tourism opportunities in the region. There is vacant industrial land near the main communities, coupled with good highway and rail connections, which could provide an attractive opportunity for certain

establishments. The addition of container facilities at Prince Rupert may be a catalyst for local industrial development, as is occurring in Terrace.

3.0 Forest Industry Profile

The last socio-economic profile of the Kispiox TSA examined the industry's performance over the period 1997 to 2000⁶. In 2001, the TSA's harvest volume dropped precipitously, and has remained at a relatively low level thereafter (Figure 3). The TSA current AAC of 977,000 m³ per year took effect January 2003. However, the actual harvest has since averaged about one third of the AAC.

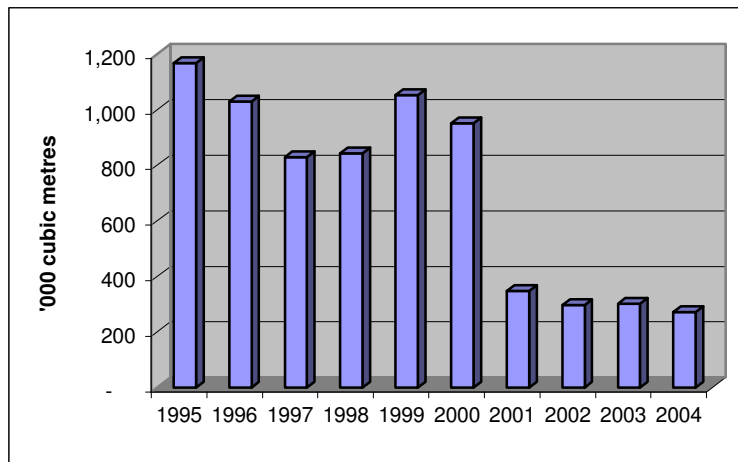


Figure 3: Harvest Billing History

Several factors explain the sharp decline in TSA's harvest. The fundamental element is the large component of low quality timber in the TSA's timber profile. These low quality, typically low priced logs limit how far they can be economically transported. Poor timber quality, along with other issues, combined to put Skeena Cellulose Inc. (SCI) into receivership in 2001. This directly impacted the TSA because the company's forest license accounted for about two thirds of the TSA's AAC. After 2001, SCI's harvest from its license was sharply curtailed and its Carnaby sawmill in Hazelton closed. Moreover, the closure of the pulp mill in Prince Rupert meant the other forest companies in the region generally, and TSA saw mills specifically, lost their main buyer of pulp logs and chips. The sale of these products is a key revenue stream to independent saw mills. Compounding the financial impact on local mills for a period was that the low lumber recoveries and chip values were not accurately reflected in stumpage appraisals. These issues have since been reviewed by the Ministry of Forest and Range (MoFR) and steps have been taken to address them.

Other events amplified this basic problem. The on-going trade dispute with the US and the assessment of duties reduced the value of lumber sales to that market. While the TSA is largely unaffected by the pine beetle epidemic, the accelerated harvest of the infected stands has created a surplus of pulp chips that has kept chip prices low.

⁶. Ministry of Forests, 2000. *Kispiox Timber Supply Area Analysis Report, Socio Economic Analysis*. Chap. 8, Socio-Economic Analysis

Moreover, with SCI going into receivership, it was not able to fully pay local companies for goods and services it had purchased, and this had a ripple effect, as the affected firms dealt with their employees and suppliers.

Licenseses indicated there are a number of hopeful signs that may bode well for the TSA's. Specifically, the sale of New Skeena Forest Products to Sun Wave Forest Products, with the intention of re-opening the Prince Rupert pulp mill. This would greatly strengthen the market for pulp logs and chips. The site of the Carnaby mill may become a log sort yard, and a source of saw logs for the two mills still located in the TSA. There has been some interest in the past of opening a pellet plant, or a co-generation facility at the Carnaby site, but these projects are not being activity promoted at this time.

There are two medium sized mills located in the TSA (Table 5). Since 2004, the Kispiox Forest Product mill has been closed. There are also five to six smaller mills operating in the TSA.

Table 5: Timber Processing Facilities in Kispiox TSA

Company	Type of Mill	Mill Location	Estimated Capacity (MBF / year)
Kispiox Forest Products	Lumber	South Hazleton	48
Kitwanga Mills Ltd.	Lumber	Kitwanga	55

Source: BC Ministry of Forests, 2005. Major Primary Timber Processing Facilities in British Columbia, 2004.

3.1 Kispiox TSA Allowable Annual Cut and Harvest History

The AAC for the Kispiox TSA is currently 977,000 m³ per year. It took effect on January 1, 2003, and was a reduction of about 10% from the previous AAC. The apportionment of the harvest under replaceable and non-replaceable forest licenses is summarized in Table 6.

Table 6: Allowable Annual Cut Kispiox TSA

	Volume (m ³ /yr)
Allowable Annual Cut (2001-04-30)	977,000
Apportionment	
Forest Licences Replaceable	788,065
Forest Licences Non-Replaceable	30,435
Timber Sale License	17,034
BCTS Timber Sale License	242,466
Forest Service Reserve	11,000
Woodlots	3,611
Total	1,092,611

Source: Ministry of Forests, Apportionment System, effect 2005-08-31

The licensed volume is the maximum allowable annual average harvest over the term of the cut control period, without penalty.⁷ The actual harvest volume may diverge from the AAC as

⁷In any given year the harvest volume may be up to 150% of the licensed volume, and 110 % over 5 years with subsequent offsetting reductions.

license holders have some latitude for meeting the cut-control requirements (Table 7). As shown in Figure 3 the actual aggregate harvest has been well below the maximum allowable level since 2001. A more detailed breakdown of billed harvest volume by license categories is shown in Table 8. The table indicates that reduced harvest from replaceable forest licenses accounts for a large proportion of the decline.

Table 7: Commitments

Forest Licence	Licensee	Volume (m ³)
<i>Replaceable</i>		
A16818	Kispiox Forest Products Ltd.	64,124
A16831	New Skeena Forest Products Inc	387,879
A16832	Bell Pole Company	55,414
A16833	Kitwanga Mills Ltd.	87,571
A74498	Canema Timber Ltd.	11,381
<i>Non-replaceable</i>		
A57426	Kispiox Forest Products Ltd	30,435
A60281	Anspayaxw Tenure	53,406
Total		690,210

Source: Ministry of Forests, Apportionment System, effect 2005-08-31

Table 8: Volume Harvested by Type of License (m³/yr)

	2000	2001	2002	2003	2004	5 Year Average
Replaceable Forest License ¹	710,807	255,802	237,584	217,978	135,115	211,620
Non-Replaceable Forest License ¹	9,691	9,449	19,562	6,301	13,327	12,160
SBFEP/BCTS	230,001	81,723	37,436	76,445	118,843	78,612
Forest Service Reserve	267	580	331	502	1,774	797
Woodlot Right Of Way	-	811	1,448	737	-	749
Total Crown	950,766	348,366	296,360	301,964	269,059	303,937
Private Land ¹	14,369	8,722	10,316	17,634	5,886	10,640
Woodlots ²	13,834	3,670	14,185	10,547	16,043	11,112
Total Kispiox Volume	978,969	352,036	310,545	312,511	285,102	315,049

Notes

1. Total Crown volumes and private land from Ministry of Forests Harvest Billing Records, billed volumes

2. Ministry of Forests cut control letters

3.2 Kispiox TSA Major Licensees

The recent operating history of the TSA's larger license holders is summarized in this section.

Kitwanga Lumber operates a saw mill in Kitwanga and holds a renewable forest license with an annual quota of 87,571 m³ per year (Table 9). Over the period 2000 to 2004, the mill's average annual input volume was 123,500 m³. The log input is from its own TSA license, with about an equal volume purchased or traded from other Kispiox TSA licensees (e.g. wood harvested under

BC Timber Sales). About 20% of the mill's input volume is from non-TSA sources. Pulp logs (16-26% of harvest volume) are sold or traded outside of the TSA. The mill's largest markets for solid wood products are BC, the rest of Canada, the US, Mexico, and Asia.

Table 9: Kitwanga Forest Products Harvest and Direct Employment Statistics

Statistic	Value
Allowable Annual Cut	87,571 m ³
2004 Harvest	65,285 m ³
2000-04 average harvest	70,433 m ³
Direct Employment	
Harvesting	30
Processing	27

Source: Licensee response

Kispiox Forest Products holds two forest licenses in the TSA with a total annual harvest of 94,559 m³ (Table 10). It also holds with Gitskan Investments a 5-year non-renewable license for 53,406 m³. The company has a sawmill located in South Hazelton. The mill has been temporarily closed since February 2004. The mill's annual sawlog requirement is approximately 100,000 m³ (at two shifts). While operating, logs were purchased from Kispiox, Kalum, and Bulkley TSA's to supplement supply from its own license. The mill's main markets were the United States and Japan, with other sales to Saudi Arabia, Canada and Mexico. The closure of the mill may be attributed to several negative factors, which were noted earlier.

Table 10: Kispiox Forest Products Harvest and Direct Employment Statistics

Statistic	Value
Allowable Annual Cut	64,124 m ³
Non-Replaceable license	30,435 m ³
2000-04 average harvest	48,108 m ³
Non-Replaceable license	4,300 m ³
Direct Employment	
Harvesting	20
Processing (2 shifts when operating)	63

Source: MoF Harvesting Billings Report and Licensee response

New Skeena Forest Products: The last "normal" year of operations for SCI was 2000. In that year, the company harvested some 540,000 m³ from its license in the TSA. It operated two processing facilities in the TSA: the Carnaby sawmill and a chipping complex with an annual capacity of approximately 750,000 m³ and the Hazelton whole log chipper with an annual capacity of about 300,000 m³. Employment related to the harvest and processing of this volume was some 280 fulltime equivalent positions in the woodlands operations, and 160 people in the Carnaby mill and Hazelton facility. In February 2001, the Carnaby operation shut down with over 100 people receiving layoff notices. At that time, the company's TSA license ceased supplying saw logs to the Carnaby mill, and ceased producing pulp logs in April 2001. To 2004, the license remained somewhat active (Table 11), providing logs to the Kitwanga Lumber

sawmill, which was owned by Skeena Cellulose until 2003. In November 2005, Ernst and Young held the forest license in bankruptcy. A court approved sale to Sun Wave Forest Products has been completed however the mill is not currently operating.

Table 11: New Skeena Forest Products Harvest and Direct Employment Statistics

Statistic	Value
Allowable Annual Cut	387,879 m ³
2004 Harvest	0 m ³
2000-03 average harvest	186,325 m ³
Direct Employment in 2004	
Harvesting	0
Processing	0

Source: MoF Harvesting Billings Report

Bell Pole holds one forest license in the TSA (Table 12). The company produces utility poles for markets throughout North America. The company had a processing facility in Terrace. It traded logs, mainly with SCI for pole material. This plant was shut down about five years ago and the property sold. Since then, logs harvested from the company's tenure are sold on the open market, mainly to Carnaby mill and Hazelton chipper (while they were operating), Kispiox Forest Products and Kitwanga lumber. Over the most recent four years, harvest from the license has varied from a high of 68,000 m³ in 2000, to 1,400 m³ in 2001. In the most recent five years, on average about 50% of Bell Pole's TSA harvest was processed in TSA mills.

Table 12: Bell Pole Harvest and Direct Employment Statistics

Statistic	Value
Allowable Annual Cut	55,414 m ³
2004 Harvest	47,886 m ³
2000-04 average harvest	33,967 m ³
Direct Employment in 2004	
Harvesting	10
Processing	0

Source: Licensee response

BC Timber Sales: In June 2001, the Ministry of Forests (MoF) was directed to transform the Small Business Forest Enterprise Program (SBFEP) into an independent organization within the ministry and to operate it on a more commercial footing. BC Timber Sales (BCTS) is the resulting organization. It sells timber competitively at auction to registered operators. The buyers are independent logging and small mill operators.

Since the BCTS volume is sold at auction, the proportion of sales won by TSA resident contractors, and the disposition of the harvest volume to TSA and non-TSA mills, will vary. Over the past five years, the number of registrants in the Kispiox TSA program has been declining. Sales are market sensitive, and depend on the profile of the stands being offered at

auction. In recent years, hemlock and spruce stands have accounted for most sales. Balsam, which makes up a large portion of the TSA profile, has not been actively sought in the log marketplace due to the abundant supply of pine harvested to control the beetle infestations. In 2004, about half of the sold volume was awarded to non-TSA operators (Table 13). A large portion of the harvest volume is processed outside the TSA, at mills in Terrace and Smithers.

Table 13: BC Timber Sales Harvest and Direct Employment Statistics

Statistic	Value
Allowable Annual Cut	242,466 m ³
2004 Harvest	118,843 m ³
2000-04 average harvest	108,890 m ³
Direct Employment in 2000	
Harvesting	Not available
Processing	Not available

Source: MoF Harvesting Billings Report

In addition to the companies discussed above, a report entitled *The Small Scale Wood Processing Sector in the Kalum-Kispiox Region of British Columbia: Challenges and Opportunities* (Brouwer and Jobb, 2005) identifies 19 "cutting for profit", small sawmills operating the Kispiox area. Their wood supply may include BCTS sales, and purchased wood from woodlots, private land and licensees. Most of the wood is harvested in the TSA. Products and markets vary among the operators. The view is that with the closure of major mills in the area, the number of small mills has increased. This is attributed to out-of-work persons with forest industry experience starting small operations rather than moving out of town.

3.3 Summary of Forest Sector's Contribution

The findings of the industry survey are summarized in Table 14. The Forest sector's performance is characterized at the average harvest level for the most recent three years hence does not correspond to actual conditions at a given point in time. To provide a point of reference, the corresponding values report in the last Analysis Report are shown, and the change for the two periods.

Table 14: Comparison of Forest Sector Contributions

	2001 - 2004	1997 - 2000 ¹	Gain (Loss)
AAC ('000 m3)	977	1,092	(115)
Actual Average Harvest ('000 m3)	315	906	(591)
TSA direct employment	144	497 ¹	(338)
Total BC direct employment	265	757 ¹	(492)
TSA direct employment income (\$million)	6.08	25.1	(19.02)
Total BC direct employment income (\$million)	11.30	38.1	(26.8)
Average stumpage (\$/m3)	6.48	8.6	(2.13)
Average stumpage revenue (\$million)	1.98	9.4	(7.42)

Notes: Table 14, page 71, Kispiox Timber Supply Area Analysis Report

Direct employment includes woodlands operations (e.g. harvesting, transport, road building/maintenance), silviculture and planning, and processing. Most of this employment is directly related to the harvest volume, which has dropped significantly since 2001. The 2001/2004 employment estimate may be overstated because it was assumed all of the harvested timber was processed, hence supporting mill employment. But it is known that in some instances low quality logs are not processed. The industry survey also indicated that non-TSA residents had increased their relative participation in harvesting and silviculture activities. This exacerbated the TSA employment loss. It is evident that the forest sector's decline is not confined to TSA communities. Direct employment and incomes in adjacent communities (e.g. Smithers, Terrace) have also been impacted. Stumpage revenue from the TSA to the provincial government has fallen about 80% relative to the earlier period.

4.0 Socio-Economic Implications of Base Case Timber Supply Forecast

This section presents the potential implications of future timber supply forecasts on employment, incomes, government revenue and community implications.

Our approach to forecasting the economic outcomes rests, in part, on current industry operating conditions (e.g. fixed employment coefficients per unit of harvest). These values were derived from the TSA industry survey and other sources. In reality, changing technology and other factors means that the coefficients will typically change over time. For instance, increased mechanization that makes workers more productive would lower the person years of employment per unit of production. This bias alone would suggest that forecast values become more uncertain the further into the future it is extended. For this reason, the economic implications are shown as annual average values that might prevail over the next decade.

Nevertheless, the most significant challenge posed in forecasting future conditions for the Kispiox TSA is anticipating future harvest volumes, since recent experience is that the actual harvest has been well below the volume available to harvest.

This matter is addressed by considering three timber supply forecasts as presented in the Analysis Report. The “Base Case” timber supply forecast represents the maximum wood volume that may be available, given the size of the productive land base, assumptions about forest growth, as well as satisfying administrative constraints regarding harvest flow. The Base Case harvest volume in the next 20 years is forecast to remain constant at 977,000 m³ per year. However, recent experience is that the lower quality logs in this TSA’s harvest profile cannot be economically harvested. This is because the pulp mill in Prince Rupert closed, and log prices are not high enough to support the added transport cost to other mills wishing to buy the material. As long as these conditions persist, one would expect the average harvest level to be less than the maximum volume available for harvest.

Table 15 shows the reduction in Base Case harvest volume when no pulpwood is harvested (termed the “No Pulpwood Harvest” scenario). In the first decade, this is a 16% reduction from the Base Case volume. However, this harvest profile includes timber that is marginal for sawlogs, and depending on the economic conditions may not be economic to harvest either. Table 15 also presents a harvest forecast where the timber is restricted to sawlog quality timber (termed “No Pulpwood or Marginal Sawlog Harvest” scenario). The harvest volume given this assumption is some 419,000 m³/yr in the first decade. This is still somewhat greater than the actual average harvest level in recent years.

The fact that recent harvest levels in the TSA are lower than the No Pulpwood or Marginal Sawlog scenario suggest this scenario may overestimate the economically viable timber supply in the TSA, given the current economic conditions. Most stands in the TSA, even those identified as being predominantly sawlog stands, contain a component of pulpwood. Without a viable pulp market, stands become uneconomical to harvest based on logging cost, haul cost, and the percentage of pulpwood within each stand.

Table 15: Base Case and Alternative Harvest Scenarios (1,000's m³/yr)

Years From Now	Base Case	No Pulpwood Harvest	% Difference	No Pulpwood or Marginal Sawlog Harvest	% Difference
5	977	822	-15.9	419	-57.1
10	977	822	-15.9	419	-57.1
15	977	738	-24.4	408	-58.2
20	977	738	-24.4	408	-58.2

Source: Timber Supply Analysis Report, Table 11

As is discussed in the Analysis Report, there is a large quantity of available growing stock in the first 30 years of the 250 year planning horizon. Because of this there are many different options for achieving the current AAC of 977,000 m³/yr and therefore increasing constraints or removing available area does not generally have a significant impact on short-term timber supply. This is evident when examining the differences in the short-term harvest level between the Base Case the No Pulpwood. In the No Pulpwood, 50% of the operable growing stock (39 million m³) is removed from harvest eligibility resulting in a 15.9% reduction in the short-term harvest level. The large quantity of sawlog and marginal sawlog volume, relative to the harvest level greatly reduces the short-term impacts of removing the pulpwood component. After 55 years, the impact of removing the pulpwood component increases with a harvest level 39% lower that that of the Base Case. Refer to Section 6.1 of the Analysis Report for the complete results of this analysis.

The economic implications of the three harvest scenarios are summarized in Table 16 and discussed below. The values represent average annual values in the first decade of the harvest forecast. The implications are intended to indicate the magnitude of the potential effect, given the stated assumptions, rather than a prediction of expected values.

Table 16: Socio-Economic Impacts of the Base Case Harvest Forecast

	Current Value	Base Case	No Pulpwood Harvest	No Pulpwood or Marginal Sawlog Harvest
Timber Supply ('000 m³)				
AAC	977			
Average Harvest Level	315	977	822	419
Average Sawlog Harvest Level	315	410	436	408
Kispiox TSA Implications				
<i>Employment (person years)</i>		<i>Change from Current Values¹</i>		
Direct	144	+252	+212	+84
Indirect/Induced	47	+62	+54	+24
Total	191	+314	+266	+108
<i>Employment Income (\$ millions)</i>		<i>Change from Current Values¹</i>		
Direct	6.08	+9.81	+8.33	+3.39
Indirect/Induced	.91	+1.20	+1.04	+0.45
Total	6.99	+11.01	+9.37	+3.84
Province Implications (includes Kispiox TSA)				
<i>Employment (person years)</i>		<i>Change from Current Values¹</i>		
Direct	265	+556	+426	+87
Indirect/Induced	318	+669	+512	+105
Total	583	+1225	+938	+192
<i>Employment Income (\$ millions)</i>		<i>Change from Current Values¹</i>		
Direct	11.30	+23.74	+18.18	+3.73
Indirect/Induced	6.14	+12.90	+9.88	+2.03
Total	17.44	+36.65	+28.06	+5.75
Provincial Government Revenues (\$ millions/yr.)				
		<i>Change from Current Values¹</i>		
Provincial Income Tax	2.44	+5.13	+3.93	+0.81
Stumpage	2.04	+2.18	+2.33	+1.52
Rent and Royalties	0.48	+1.00	+0.77	+0.16
Other B.C. revenues	0.60	+6.84	+5.66	+2.59
Total Revenue	5.56	+15.16	+12.69	+5.08

See Appendix 1 for derivation of table

¹ The scenario values reported in *italics* are reported as the change from Current Value. One should add the scenario value to the corresponding Current Value to obtain the total value indicated for the scenario.

For the Base Case scenario, the annual harvest level is 977,000 m³, or more than three times the average harvest level in recent years. In order for this harvest level to be realized, given the TSA's timber profile, a market for the lower quality logs must be found. It is assumed here that the market would be outside the TSA. The increased harvest will add some 550 person years to provincial employment in the forest sector, with about 250 person years of employment being created in the TSA. Also, it is assumed that the TSA's existing saw milling industry would process all of the sawlog volume. This assumption results in some increase in milling employment (25 person years), with most of the increased employment in woodlands activities (230 person years). This would increase recent employment in the TSA forest industry from some 150 persons, to 400, a substantial increase. The 250 new positions may be filled by a combination of existing residents returning to work in the TSA, by presently unemployed TSA residents with the necessary skills, as well as in-migrants to TSA communities. The total

increase in TSA employment (i.e. direct plus indirect) is some 320 person years of “new” employment.

Except for stumpage revenue, fixed revenue coefficients based on best available information were adopted to estimate government revenues. Stumpage rates were adjusted to roughly reflect the differences in log quality in the respective scenarios. That is, the stumpage rate attached to pulp log’s share of harvest volume was \$.25 per cubic meter. The stumpage rate attached to a marginal sawlog was \$1.50 per cubic meter. The average stumpage price for a sawlog was \$8.70 per cubic meter, which is the TSA average stumpage rate for the period 1995-2004. The weighted average stumpage value for the three scenarios was \$4.42, \$5.32 and \$8.51/m³, respectfully. Based on the parameter values adopted, most of the provincial revenue is collected from income taxes and a variety of other taxes paid by the industry, rather than stumpage.

If no pulp logs are harvested, the timber supply averages some 822,000 m³/yr. This is still a large increase from recent conditions. The volume is greatly in excess of the capacity of TSA’s existing mills to process, and it is assumed for projecting impacts that all of the marginal sawlogs are processed outside the TSA. The incremental gain in TSA and provincial forest sector employment is 212 and 426 person years respectfully. For the TSA, the total increase in employment would be about 270 person years. Like the base case, this increase in employment would probably increase TSA population.

If the harvest is restricted to sawlog quality timber, the timber supply in the first decade is some 419,000 m³/yr, or about a one third increase relative to recent conditions. It is assumed that the full volume could be processed in TSA mills, hence a higher proportion of the employment and income impacts occur in the TSA as compared to the other two scenarios. This scenario increases forest sector employment by some 84 person years employment, and almost 110 positions in total. This is nearly a 60% increase in the forest industry work force relative to recent conditions. Incomes and government revenues are also significantly higher compared to recent conditions. Hence, even though the “sawlog only” timber supply forecast is well below the other timber supply forecasts, if this harvest level were realized, it would bring a substantial improvement in the TSA’s economic conditions.

5.0 References

5.1 References

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5.2 Persons Contacted

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Appendix I - Derivation Of Coefficient Values And Assumptions

The following table sets out the values and assumption used in the report to estimate current, and future economic impacts associated with the Kispiox TSA harvest volume.

	Current	Forecast	Comments/discussion
1. Kispiox TSA			
Direct Employment (PY's/000 m³)			
Harvesting	0.156	0.21	Current value from industry survey. Assumed TSA resident's employment in harvesting would return to 1997/00 values at higher harvest rates.
Silviculture	0.05	0.09	As above
Processing	0.25	.25	Ratio is from 1997/00 average. Assumes that the 2 existing mills will expand according to take increased volume to 419,000 m ³ sawlog volume. Assumption is processing of marginal sawlogs and pulp logs would occur outside the TSA
Indirect/Induced Employment (PY's/000 m³)			
Harvesting	0.23	.23	Kispiox TSA employment ratio, no migration. From 2001 Economic Dependency Ratios, BC Stats
Processing	0.41	.41	As above
Employment Income (before tax income/PY)			
Harvesting, silviculture	\$ 38,230	\$ 38,230	2004 average weekly, SELF, \$955 and assume 40weeks/PY
Processing	\$ 45,734	\$ 45,734	2004 average weekly, SELF, \$952 and assume 48weeks/PY
Indirect/induced	\$ 19,296	\$ 19,296	2004 average weekly, SELF, \$402 and assume 48weeks/PY
2. Province (includes Kispiox TSA)			
Direct Employment (PY's/000 m³)			
Harvesting	.24	.24	Provincial coefficients were from Analysis Report, TSR 2, Table 14.
Silviculture	.1	.1	As above
Processing	.50	.50	As above
Indirect/Induced	1.01	1.01	As above
Employment Income (before tax income/PY)			
Assumed same income/PY as TSA values reported above			
Provincial government revenues			
Provincial income tax	14%	14%	Average rate 2001 Census, Kispiox TSA
Stumpage (\$/m ³)	\$ 6.48	Varies with forecast	Current is average stumpage billing 2001/04. Forecast period uses average value of \$8.69 m ³ for the sawlog volume (419,000 m ³), which is the TSA average stumpage rate for the period 1995/05. An average value of \$1.50 m ³ was applied to the marginal sawlog volume, and \$.25 to the pulp log volume. The average stumpage for the sawlog, sawlog + marginal saw log, and the base case forecasts were \$8.69/m ³ , \$5.09 and \$4.41 respectively.
Rent & Royalties (\$/m ³)	\$1.52	\$1.52	Estimated from industry average values as reported 1997/00.
Other B.C. revenues (\$/m ³)	\$ 1.90	\$ 7.62	Other revenues include corporate income tax, property tax, logging tax, capital tax, sales tax and electricity tax, as estimated by PriceWaterhouseCoopers. The industry average value is \$7.62/m ³ . Presently, given the low profitability and low production levels of the TSA's industry, the TSA average tax payment would be less than the industry average. To approximate this, the current value is 25% of the provincial industry average value.

