

The New Brunswick Forest Industry: The Potential Economic Impact of Proposals to Increase the Wood Supply



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Executive Summary

New Brunswick's forest industry consists of three key industries: forestry and logging, wood products and pulp and paper.

The forest industry directly contributes \$1.7 billion to the New Brunswick economy, directly employs over 17,000 people in high paying jobs, and accounts for 30-40% of exports from the province.

Including the indirect impacts on supply industries, the forest industry currently supports about 7% of the jobs in New Brunswick, over 9% of the labour income and 11% of GDP.

The industry generates over \$260 million in tax revenues for the provincial government thereby sustaining about \$1 in every \$18 of government expenditure.

New Brunswick's wood products and pulp and paper industries have grown rapidly during the last decade, undertaking substantial new investment to upgrade facilities move into high value products, improve environmental standards and raise productivity.

However, the sector's high paying jobs and the income it contributes to rural areas will be at risk unless new sources of fibre can be generated to support a growing industry.

Continued investment is required to maintain the international competitiveness of this sector. Firms are reluctant to invest if there are likely to be fibre shortages "as will be the case for the Province's softwood-based industry under the present forest management strategy" (JPC, 2002).

Jaakko Pöyry recently proposed a substantial increase in silviculture spending on Crown land to ensure a long term increase in the supply of softwood from Crown land.

The increased silviculture spending will create an additional 850 seasonal jobs per year in rural areas during the first five years.

APEC projects that with this enhanced investment on silviculture, the total wood supply in the province will be 37% higher in 2062, compared with 1999 levels. This is about 15% higher than without the increased silviculture.

The increase in the wood supply will allow the forest industry to expand and diversify further into higher value added products. GDP in the forest industry, including indirect impacts on other industries, is estimated to increase by 46% between 2002 and 2062. This is about 17% higher than without the increase in silviculture.

The total number of forest and related jobs is forecast to increase by about 100 positions by 2062 but will decline substantially without increased silviculture spending.

Provincial tax revenues from the forest industry will increase to almost \$400 million.

The analysis illustrates that there are benefits to the province and industry from increasing the wood supply. The report clearly identifies the choices which will have to be made to ensure a strong foundation for the industry in the future.

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Glossary of Terms

Annual allowable cut: The volume of wood governments allow companies to cut each year.

Crown land: Land vested in the Crown that are under the administration and control of the Minister for Natural Resources.

Direct impact: The direct impact measures the direct output, GDP, employment or similar variable of an industry.

DNR: New Brunswick Department of Natural Resources.

GDP: Gross domestic product (GDP) is a standard measure of economic activity. It measures the total value of output in an industry less the value of inputs used during production. It is also known as value added.

Hardwood: Trees which are generally deciduous, broad leafed species such as maple, birch and aspen.

Indirect impact: This reflects the impact of the forest industry, for example, on supplier industries such as trucking, electricity generation and financial services.

Labour income: Includes wages and salaries, earnings of the self-employed and employer contributions to pensions and employment insurance.

Licensee: The holder of a Crown timber license. There are currently six licensees in New Brunswick which collectively hold ten timber licenses.

Planting: Establishing a forest by setting out seedlings, transplants or cuttings in an area.

Pre-commercial thinning (PCT): A silviculture treatment to reduce the number of trees in young strands, often carried out before the stems removed are large enough to be use or sold as a forest product. This treatment prevents stagnation and improves growing conditions for the remaining crop trees so that at final harvest the end-product quality and value is increased.

Royalty: The amount payable to the Crown for timber harvested on Crown land.

Silviculture: The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands. It includes planting, tending and thinning.

Softwood: Cone-bearing trees with needle or scale-like leaves such as spruce, fir, cedar and pine.

Tending: Any operation carried out for the benefit of a forest crop or an individual tree, at any stage of its life. It includes operations both on the crop itself and on competing vegetation but not site preparation or regeneration cuttings.

Acknowledgements

This project was guided by a Steering Committee consisting of representatives from the New Brunswick Department of Natural Resources, the New Brunswick Department of Finance and the New Brunswick Forest Products Association (NBFPA).

The Atlantic Provinces Economic Council (APEC) would like to thank both government departments and the industry association for their guidance and provision of data during this project. APEC would like to specifically acknowledge the cooperation of the licensees and several sub-licensees in completing three industry surveys to collect additional information required for this study. Financial support for this project was provided by the New Brunswick Department of Natural Resources.

Part I:

Introduction and Background

Introduction

The forest industry is a leading contributor to New Brunswick's economy. However, the industry's growth is constrained by the supply of available timber. This report examines the potential economic impact of recent proposals to increase the long-term wood supply from Crown land.

The forest industry is a mainstay of New Brunswick's output and employment base. The industry has grown rapidly during the last decade – double the growth rate in the rest of the economy.

The core of the forest industry has long been the pulp and paper sector. This sector has diversified in recent years by using new processes to create more advanced products.

The wood products industry has taken off during the last decade – doubling its output. This sector has also diversified to include industries such as particle board, fibreboard and other byproducts.

A key constraint on future growth and diversification is the lack of supply of available timber.

Industry and government jointly commissioned an independent expert consultancy firm to examine the potential for increases in wood supply on Crown land, which accounts for more than 40% of the total fibre supply in the province.

The report by Jaakko Pöyry Consulting (JPC), *New Brunswick Crown Forests: Assessment of Stewardship and Management*, was released in December 2002.

The report indicates that New Brunswick could substantially increase its long-term supply of softwood for commercial use by improving its management of Crown land and by increasing spending on silviculture.

The report makes it clear that “without access to incremental fiber supplies, there will likely be a reduction in the forest industry in the Province.”

The Province subsequently commissioned the Atlantic Provinces Economic Council (APEC) to profile the current economic impact of the New Brunswick forest industry and to examine the potential economic impact of implementing the Jaakko Pöyry proposals.

This report presents the results of that analysis. It is intended to inform and contribute to the public discussion about the opportunities and strategies to increase the available wood supply from Crown land.

The Forest Industry

The forest industry, for the purposes of this study, is defined to include three key industries: forestry and logging, the wood products industry, and the pulp and paper industry.

This report uses data on the forest industry published by Statistics Canada. It is therefore important to clarify what is included within the industry definitions.

Forestry and Logging. This industry consists of firms and workers primarily engaged in growing and harvesting timber on a long production cycle (of ten years or more). Consequently, Christmas tree production is not included.

This industry includes commercial timber tract operations and forest nurseries. Logging – firms and workers engaged in cutting timber, producing round wood, and producing wood chips in the forest – is an important activity of this sector.

Firms that mainly provide forestry support services related to harvesting timber, such as forest fire fighting services, pest control, timber valuation and reforestation services are not strictly included within this sector. However, due to data availability, references in this report to direct employment in the forestry and logging industry also includes employment in forest support services. For all other variables in this report, such as output, labour income and taxes, forest support services are included as part of the indirect impact of the forest industry.

Wood Products. This industry consists of firms and workers principally engaged in manufacturing products from wood. It is composed of three main sub-sectors:

- **Sawmills:** These mills saw logs into lumber and similar products.
- **Mills and manufacturers that improve the natural characteristics of wood:** These include structural wood products such as I-joists; veneer and plywood mills; particle board and fibreboard mills; and waferboard and oriented strandboard (OSB) mills.
- **Other wood product manufacturers:** These include those making wooden doors and window frames; railings, flooring and panels; boxes, crates and barrels; and mobile homes and prefabricated buildings. Firms making wooden furniture, such as kitchen cabinets and office chairs and desks, are not included in this sector.

Pulp and Paper. This industry consists of firms and workers engaged in manufacturing pulp, paper and paper products. It includes pulp, newsprint, paper (such as coated paper, fine paper and tissue paper stock), and paperboard mills. It also includes manufacturers of paper and paperboard products such as boxes, containers, bags, stationary products and sanitary paper products.

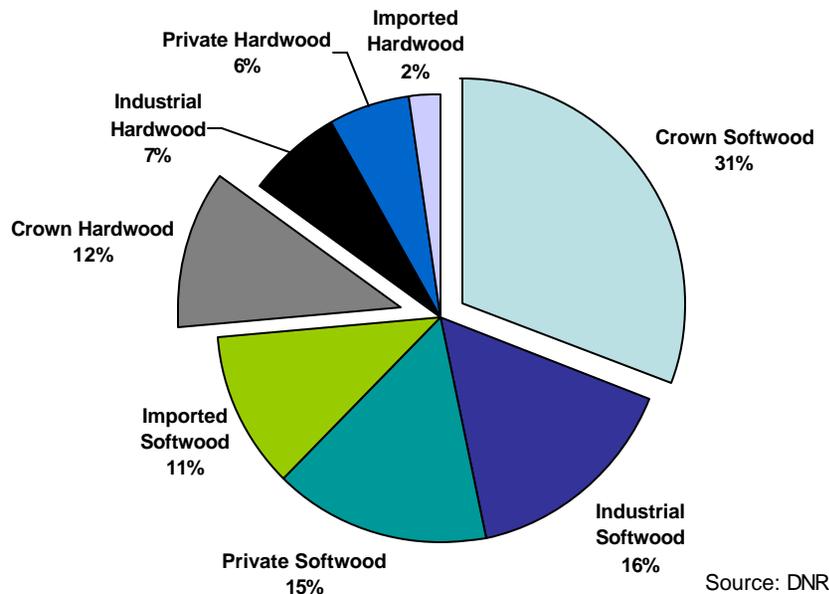
Wood Supply, Silviculture and Forest Management

Crown land is the most important source of wood in New Brunswick, supplying about 43% of the fibre consumed by New Brunswick's mills.

There are four sources of fibre for New Brunswick's forest products industry. Crown land is the most important source, accounting for about 43% of the wood supply.

Industrial freehold and private woodlots supply about 23% and 21% respectively. These domestic supplies have been increasingly supplemented in recent years by imports from Maine and other Canadian provinces. Imports now account for about 13% of the wood supply in New Brunswick.

**Source of Fibre Consumed in New Brunswick
(Average 1998-2000)**



Management of Crown Land

New Brunswick's Crown land is divided into ten timber licenses. Each timber license is licensed through a 25-year forest management agreement to a large forest-based company called a licensee. Licensees are the managers of Crown licenses under the administration of the Department of Natural Resources. The ten Crown licenses are presently leased to six licensees.

Each license also has an assigned number of sub-licensees. There are currently about 62 sub-licensees. Many sub-licensees operate smaller forest-based mills.

The annual allowable cut is the volume of wood that can be harvested each year without depleting the resource. This harvest is assigned to licensee and sub-licensee mills. The government receives royalties from the wood harvested on Crown land. These royalties amount to more than \$50 million each year.

Silviculture

Licensees undertake silviculture activity, including planting, tending and thinning trees as part of their management of Crown land. The government provides the seedlings (or equivalent funding) from the Government nursery and reimburses licensees for their silviculture costs under pre-determined reimbursement rates. Total government funding for silviculture on Crown land has averaged about \$22 million per year in recent years. Industry also contributes about \$4.7 million every year to a voluntary fund for silviculture on Crown land.

Licensees spent \$6 million in 2001 and more than \$9 million in 2002 on silviculture on their own industrial freehold. Silviculture spending will enhance the future harvests from private and Crown land.

Part II:

The Current Economic Impact of the New Brunswick Forest Industry

Output

The forest industry directly accounts for about 9% of New Brunswick's GDP. This is larger than the direct contribution made by the forest sector to British Columbia's economy.

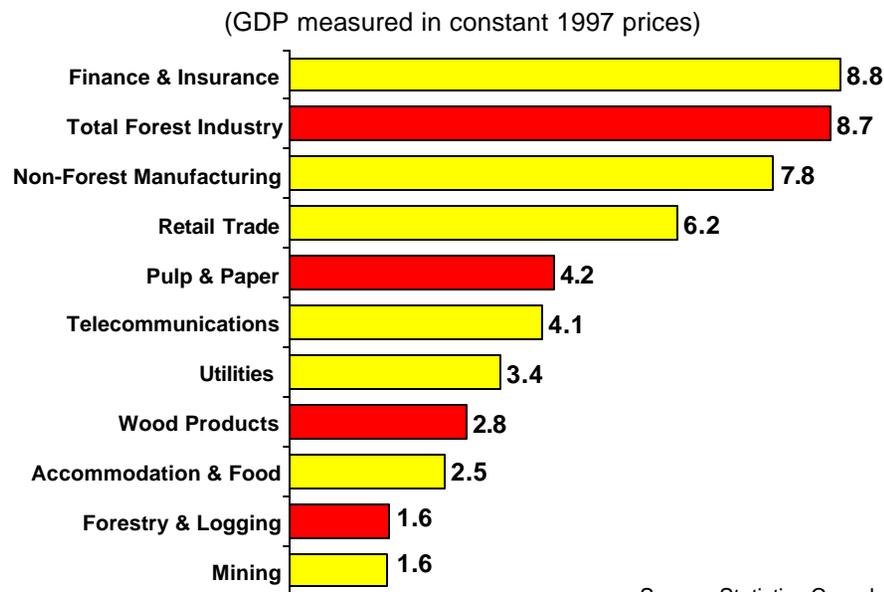
The forest industry directly contributed an estimated \$1.7 billion to the New Brunswick economy in 2002. This amounts to about 9% of provincial GDP.

By contrast, the tourism industry – which includes parts of the accommodation and food services, transportation services, and recreation and entertainment industries – is less than one quarter of the size of the forest industry, accounting for an estimated 1.9% of provincial GDP in 1998.

New Brunswick's pulp and paper industry is the largest sector within the forest industry with an estimated GDP of about \$800 million in 2002. The wood products sector contributes a further \$600 million to the provincial economy. Both sectors have doubled their output over the last decade and have grown three times faster than the rest of the economy.

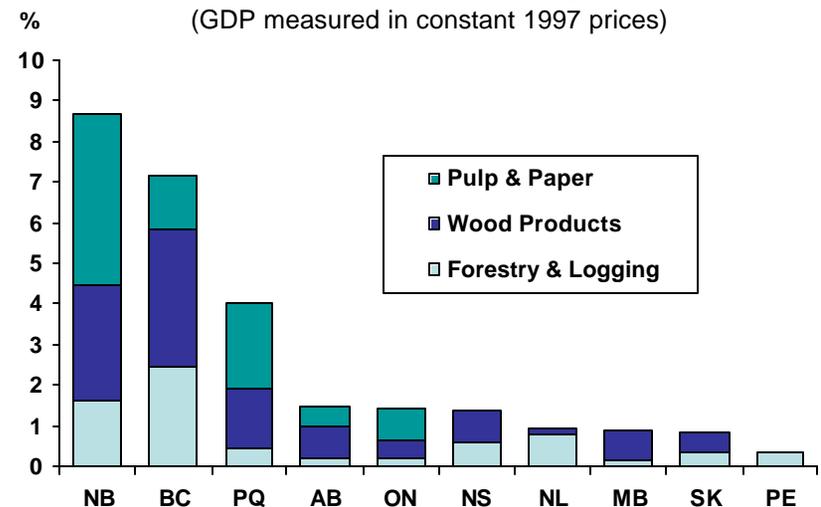
Although the forest industries in British Columbia, Quebec, and Ontario are much larger, the New Brunswick economy is the most dependent upon the forest sector.

GDP by Industry, Selected Industries
Share of New Brunswick Economy, 2002 (%)



Source: Statistics Canada

Forest Sector GDP
Share of Provincial Economy, 2002 (%)



Source: Statistics Canada

Exports

Forest products are New Brunswick's largest export after refined petroleum. They have accounted for about 37% of merchandise exports over the last eight years.

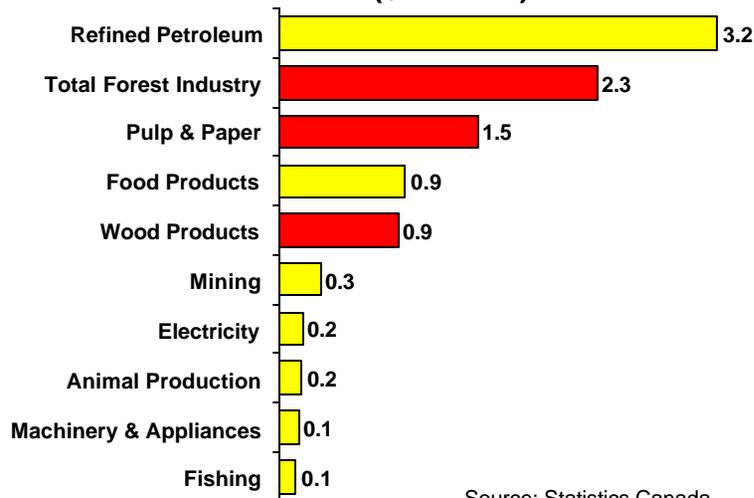
New Brunswick's forest exports grew rapidly in the 1990s to reach a record \$2.9 billion in 2000. They declined to \$2.4 billion in 2002 reflecting the slowdown in the U.S. economy, the softwood lumber dispute and weak commodity prices.

Lumber exports account for about one quarter of New Brunswick's forest exports, but wood products such as window and door frames, particle board and fibreboard have been growing rapidly. A similar shift towards higher value exports is observable in the pulp and paper industry, with fine paper stock rising in importance at the expense of market pulp and newsprint.

The United States is by far the biggest market for New Brunswick's forest products accounting for about 84% of exports. Forest exports to the United States are worth about \$2 billion annually, equivalent to about \$2,700 per New Brunswick resident. New Brunswick's softwood lumber exporters have traditionally had more open access to the US market compared with quotas or higher tariffs faced by provinces in central and western Canada.

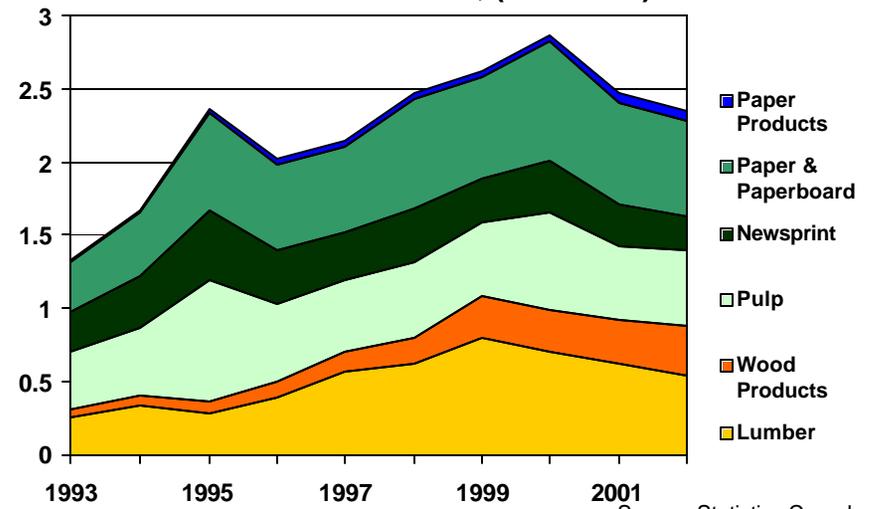
Exports to non-US countries amounted to about \$0.4 billion in 2002 with sales to more than 50 countries.

**New Brunswick's Largest Export Sectors
2002 (\$ billions)**



Source: Statistics Canada

**Exports of Forest Products
New Brunswick, (\$ billions)**



Source: Statistics Canada

Investment and Productivity

The New Brunswick forest industry has invested over \$1.2 billion over the last six years, mainly in new machinery and equipment, to support output growth and competitiveness.

The pulp and paper industry has invested \$710 million in the last six years, mainly on new machinery and equipment. The wood products sector has invested a further \$356 million. Altogether, the forest industry has spent more than \$1.2 billion on new investment in the last six years.

Recent investments in the forest products industry have been designed to modernize mills, reduce costs, improve efficiency, upgrade product quality and enhance environmental standards.

Labour productivity, measured as real GDP per hour worked, depends upon numerous factors including the capital intensity of an industry, plant size, the skill level of the workforce, technological sophistication, operational efficiency, and the market value of the products made.

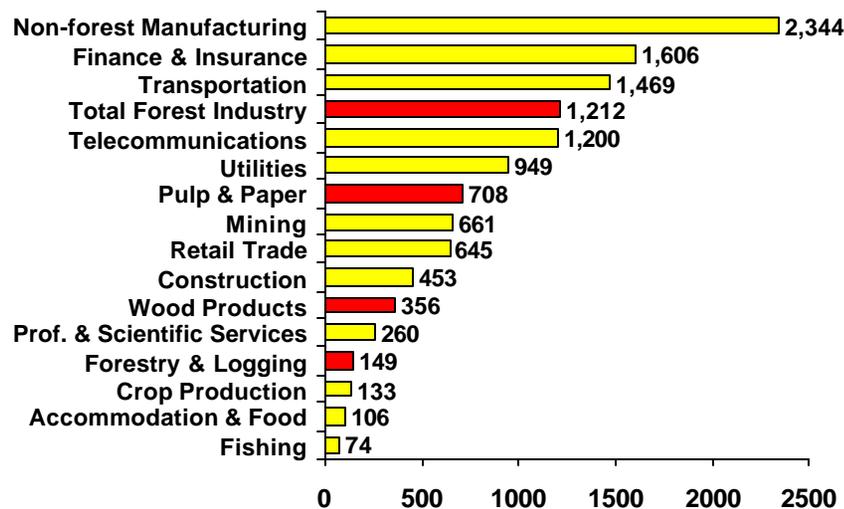
The forest products sector is one of the few industries in New Brunswick where labour productivity is stronger than the Canadian average.

Productivity in New Brunswick's wood products industry is about 2% above the Canadian average but lags well behind British Columbia.

Productivity in New Brunswick's pulp and paper mills has grown rapidly since the late 1980s, and is now about 15% higher than the national average, just behind Quebec and about 10% below Alberta.

However, Jaakko Pöyry emphasized that global cost competitiveness is at risk, with New Brunswick's pulp mills having some of the highest manufacturing costs among comparable producers.

**Cumulative Investment, Selected Industries
New Brunswick, 1997-2002 (\$ million)**



Source: Statistics Canada

Employment and Wages

About 17,300 New Brunswickers were directly employed in the forest industry last year, accounting for about 5% of provincial employment. Moreover, these are highly paid jobs.

The wood products sector is the largest source of forest industry employment with about 7,000 employees in 2002. A further 5,500 worked in the pulp and paper sector and about 4,800 in the forestry and logging sector. By contrast, there were less than 11,000 tourism jobs in 1998.

After declining in the recession of the early 1990s, employment in the forest industry increased from less than 13,000 in 1993 to about 20,000 in 2000 with more than half of these new jobs in the wood products industry. Total forest industry employment has fallen since 2000, reflecting the current market weakness for forestry products.

Jobs in the forest industry are well-paid. The pulp and paper industry is one of the highest paid sectors in New Brunswick, with average weekly earnings in 2002 of \$933, more than 50% higher than the average for all industries.

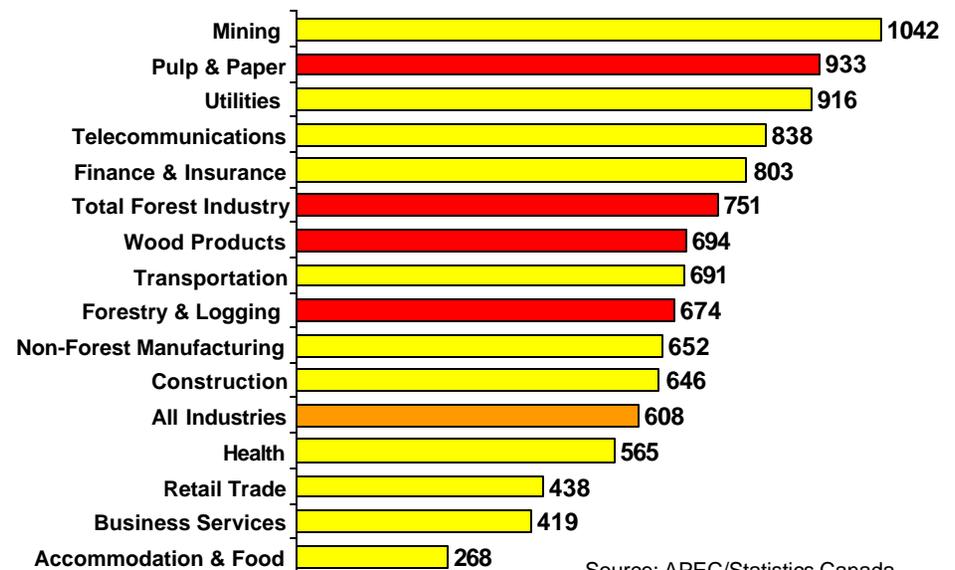
Even in the forestry and logging sector, average weekly earnings were \$674, more than 10% higher than the provincial average. Weekly earnings in the wood products industry have increased by 25% since 1996, almost twice as fast as average earnings in New Brunswick.

**Employment by Industry, Selected Industries
New Brunswick, 2002 ('000s)**



Source: Statistics Canada

**Average Weekly Earnings, Selected Industries
New Brunswick, 2002 (\$)**



Source: APEC/Statistics Canada

Employment by Region

The largest number of forest industry jobs are in the northern and more rural parts of New Brunswick. These regions are most vulnerable to any decline in the size of New Brunswick's forest sector.

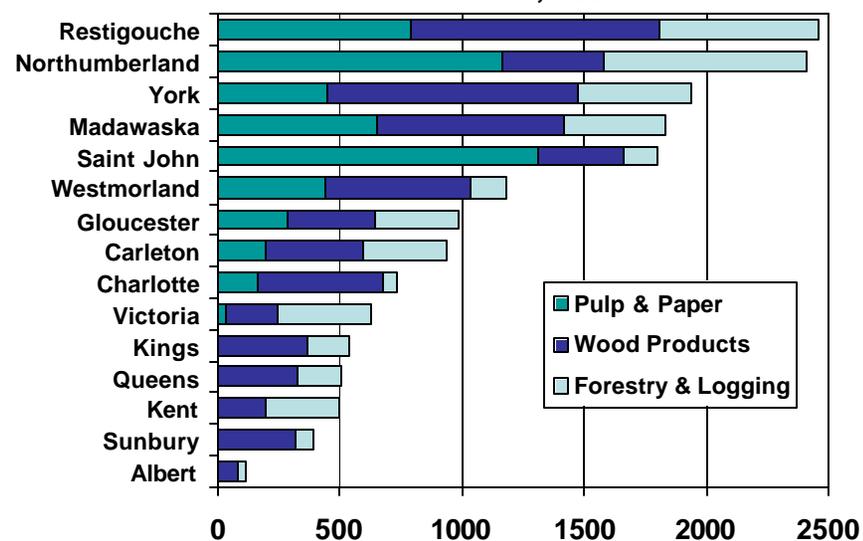
APEC has estimated the distribution of forest industry employment by county. The location of the largest forest manufacturing operations are shown on the map on the next page.

Restigouche and Northumberland counties have the largest number of forest employees with large pulp and paper mill operations and sawmills. York, Madawaska and Saint John also stand out as having sizeable numbers of employees in forest products manufacturing.

In terms of employment, Restigouche is most dependent upon the forest industry, which directly accounts for almost 18% of jobs in the county. The forest sector also directly accounts for more than 10% of employment in Northumberland, Madawaska and Queens counties.

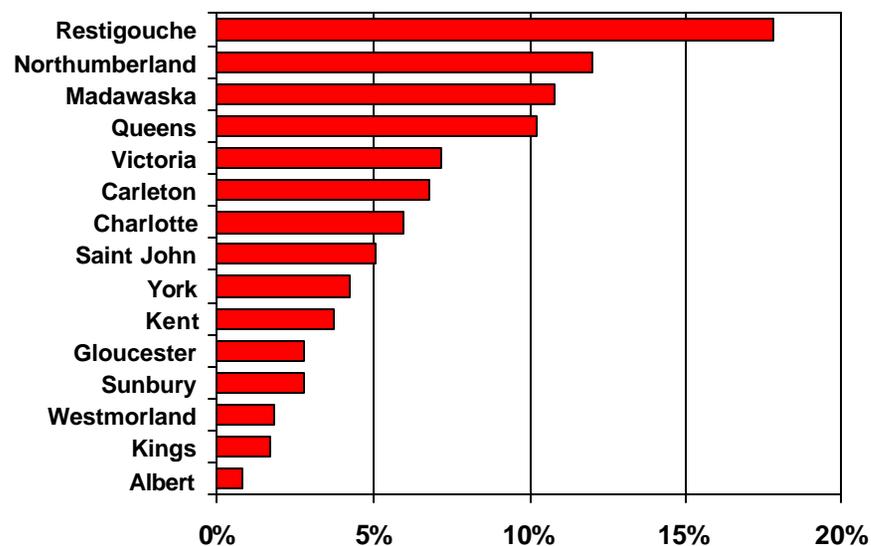
In general, the forest industry is a more important employer in counties that are more rural and have higher rates of unemployment. These regions are most vulnerable to any decline in the size of New Brunswick's forest sector.

**Estimated Direct Forest Employment by County
New Brunswick, 2002**



Source: APEC/Statistics Canada

**Direct Forest Employment as a Share of Total
Employment, New Brunswick, 2002 (%)**



Source: APEC/Statistics Canada

Regional Distribution of Forest Manufacturing Activity

The map shows the location of the largest forest products' operations.

Four main clusters of forest manufacturing activity are evident: in the northern most part of the province, along the north-west border with Maine, around Miramichi and in the Saint John area.

There are also many smaller firms and sawmills scattered across the province.

Fredericton is an important research and administrative centre for the forest industry.



Forest Industry Impact: GDP

The forest industry is one of the cornerstones of the New Brunswick economy, generating more than \$400 million of economic activity in other sectors.

The forest industry in New Brunswick directly generates about \$1.7 billion in economic activity (GDP) in the province. It creates a further \$420 million of economic activity in other (non-forest) industries. Including these indirect effects, the forest industry contributes more than one-tenth (11.2%) of the output in New Brunswick's economy.

The sectors that benefit most from supplying the forest industry include firms providing general operating, office and catering supplies for the large pulp and paper mills; electricity generation and distribution, trucking companies, and the associated supply of diesel or gasoline; financial services companies along with those providing legal and accounting services; forest support services; rail and sea transportation; and firms providing repair and maintenance services.

Forest Industry Impact: GDP, 2002, New Brunswick, (\$ millions)

	Forest Industry	Share of New Brunswick Total
Direct	1,710	9.0%
Indirect	420	2.2%
Total	2,130	11.2%

Source: APEC

Estimation of the Indirect Economic Impact

The forest industry requires the use of inputs and services from other industries. When the forest industry expands, it increases the demand for these other goods and services. As demand in these non-forest sectors grow, so does their employment and labour income.

This section estimates the impact of the forest industry on non-forest industries in New Brunswick. The estimates are based upon Statistics Canada's New Brunswick input-output model for 1999, the most recent version available.

The input-output model shows the effects of an expansion in each of the three forest industries on the output, employment and income in other sectors of the economy. These indirect effects have been scaled up to reflect the current size of the forest industry.

The wood products and pulp and paper industries both use inputs (wood and pulpwood) from the forestry and logging industry. The pulp and paper industry also uses inputs (wood chips) from the wood products industries. These indirect effects on other forest industries are netted out from the calculations as they are treated as part of the direct economic impact of the forest industry.

Forest Industry Impact: Jobs and Wages

For every 100 direct jobs in the forest industry, 35 jobs are indirectly created in other sectors. Including these indirect jobs, the forest industry supports 23,400 jobs in New Brunswick.

About 17,300 people in New Brunswick work directly in the forest industry. A further 6,100 jobs in non-forest industries depend upon the forest sector. Including these indirect jobs, the forest industry accounts for almost 7% of employment in New Brunswick.

The forest industry directly pays an estimated \$705 million in wages and salaries. When self-employed earnings are included, along with employers' contributions to pensions and employment insurance, direct labour income is almost \$850 million.

Total labour income in the forest industry, including the indirect effects, was an estimated \$1.1 billion in 2002. This equates to almost one-tenth of labour income in New Brunswick, and reflects the high-paying nature of forest sector jobs.

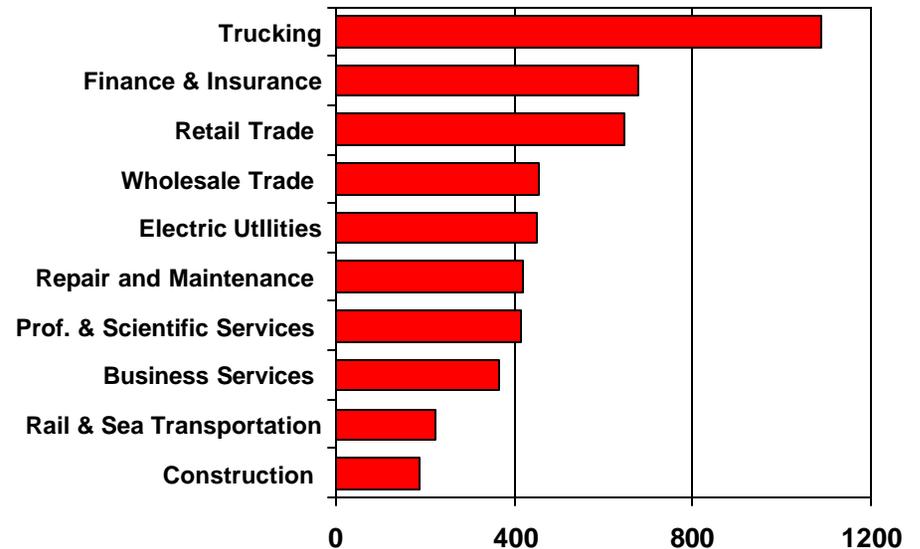
The largest number of jobs supported by the forest industry are in the trucking industry with an estimated 1100 jobs, with a further 200 plus jobs in rail and sea transportation. More than 400 repair and maintenance jobs are estimated to be required. Other large beneficiaries include jobs in finance, insurance and real estate; electricity generation and distribution; and professional and other business services (including legal services and accounting).

**Forest Industry Impact: Employment, 2002,
New Brunswick**

	Forest Industry	Share of New Brunswick Total
Direct	17,300	5.0%
Indirect	6,100	1.8%
Total	23,400	6.8%

Source: APEC

**Estimated Provincial Jobs Created by
New Brunswick's Forest Industry, 2002**



Source: APEC

Forest Industry Impact: Tax Revenue

The forest industry generates an estimated \$264 million in revenues for the New Brunswick government. This helps sustain about \$1 in every \$18 of provincial government expenditures.

Including indirect effects on other sectors, the New Brunswick forest industry generates over \$500 million in provincial and federal tax revenues. An estimated \$264 million accrues to the provincial government. These taxes amount to about 9% of own source revenues in New Brunswick, and 5.5% of total provincial government revenues once federal transfers are included.

Personal income tax paid by forest industry employees or those whose jobs depend upon the forest sector is the largest single revenue source, amounting to \$83 million in provincial tax receipts. These workers generate an additional \$55 million in provincial HST revenues when they spend their earnings on goods and services.

About \$51 million in royalties are collected from harvesting timber on Crown Land.

Net indirect taxes of \$47 million include other taxes on production or products, most notably real estate tax and the large corporations capital tax.

Forest Industry Impact: Taxes Generated, 2002, New Brunswick (\$ millions)

	Provincial	Federal	Total
Personal Income Tax	83	134	217
Retail Sales Taxes (HST)	55	44	99
Royalties	51	0	51
Net Indirect Taxes	47	8	55
Corporate Income Tax	28	51	79
Total	264	238	502

Source: APEC

Current Economic Impact: Assessment

The forest industry is a key foundation industry of the New Brunswick economy. Indeed, the province is more dependent upon the forest sector than British Columbia.

The forest industry in New Brunswick accounts for between 30% and 40% of international exports from the province. Including indirect impacts on supply industries, the forest industry accounts for about 7% of the jobs in New Brunswick, over 9% of the labour income, 11% of GDP and generates about 9% of own-source provincial government revenues.

The forest industry directly provides more than 17,000 highly paid jobs. This employment is particularly significant in many rural communities.

New Brunswick's forests provide other economic and social benefits, including supporting recreation and tourism activities. Forest companies also provide support for education and community projects throughout the province.

New Brunswick's wood products and pulp and paper industries have grown rapidly during the last decade, undertaking substantial new investment to upgrade facilities, move into high value products, improve environmental standards and raise productivity.

Continued investment is required to maintain the international competitiveness of this sector. However, firms are reluctant to invest if fibre shortages are likely to occur "as will be the case for the Province's softwood-based industry under the present forest management strategy". (JPC, 2002).

The Jaakko Pöyry report makes it clear that "without access to incremental fiber supplies, there will likely be a reduction in the forest industry in the Province." Thousands of high paying jobs, many in rural areas, and tens of millions of dollars in tax revenues are therefore at risk.

The Jaakko Pöyry recommends boosting the long-term wood supply from Crown land through increased silviculture. The next section of this report estimates the potential economic impact of these proposals for the New Brunswick economy.

Part III:

The Potential Economic Impact of the Jaakko Pöyry Proposals

The Jaakko Pöyry Proposals for Crown Land

Jaakko Pöyry showed how the long-term harvest of softwood from Crown land could be almost doubled while still meeting biodiversity objectives. What would this mean for the New Brunswick economy?

Jaakko Pöyry examined New Brunswick's forestry policies and practices in relation to global benchmarks. They found that Finland sustainably harvests sixty-five per cent (65%) more than New Brunswick per hectare of forestland. The consultants outlined what steps would be necessary to double the long-term softwood supply from Crown land:

- Jaakko Pöyry recommended that commercial timber supply should become a primary objective in Crown land management rather than being satisfied after other objectives have been satisfied.
- Annual spending on silviculture must be substantially increased. This would also require modification of current management rules to permit greater planting rather than relying on natural regeneration

Even with these proposals, Jaakko Pöyry noted that it would take approximately thirty-five years to begin to realize an increase in the annual allowable cut from Crown land. Until then, the supply from Crown land would be essentially flat.

This section of the report estimates the potential economic impact of implementing these proposals. What would these recommendations mean for the forest industry in New Brunswick? What would be the economic impact on the New Brunswick economy as a whole?

The economic impacts examined here include the potential effects on output, employment, incomes and tax revenues.

As the Jaakko Pöyry proposals involve changes to the long-term wood supply, the analysis is conducted over an 80-year projection horizon. The year 2062 is used as a reference year for presentation purposes as this is the earliest point at which the full effects of the Jaakko Pöyry proposals, i.e., expansion of the wood supply, become evident.

The model and assumptions used for this analysis are outlined and then the results are presented and assessed.

Methodology and Key Assumptions

Methodology

APEC's methodology assumes that a proportionate increase in the wood supply will lead to the same proportionate increase in the output of forest products.

Output in forestry and logging is assumed to increase in line with the harvest of the domestic wood supply. The wood products and pulp and paper industries depend upon growth in the total available wood supply (domestic plus imports).

It is therefore necessary to estimate the wood supply from industrial freehold, private woodlots and inputs in addition to the supply from Crown land. The assumptions required to estimate the supply from these other sources were developed in agreement with industry and government.

Jaakko Pöyry provided projections for softwood and hardwood harvests on Crown land and the number of hectares required for each silviculture treatment to generate the increased wood supply.

Industry surveys were used to collect additional data. These included the projected wood supply from industrial freehold based on current management plans; updated estimates of silviculture costs on Crown land; and estimates of silviculture labour inputs.

Key Assumptions

- All required industry inputs are available and the relative prices of inputs are constant. Increased output can be sold at constant real prices.
- There is a continued shift within the wood products and pulp and paper industries towards greater value added.
- Employment grows at the same rate as output after adjusting for growth in labour productivity. Labour productivity growth rates were based on an assessment of historical trends and discussions with industry experts.
- Labour productivity improvements are reflected in higher wages.
- The indirect impact of the forest industry on other sectors is based on the same input-output model presented in Part II of this report.
- Tax rates are constant.
- Real timber prices are constant such that royalties increase in line with the projected harvest from Crown land. This assumption is based upon a review of the relevant literature and discussions with industry experts. To illustrate the potential range of outcomes, estimates for royalties are also presented under the assumption that real timber prices increase at 0.5% per year.
- Imports decline in the short-term due to competing demand from neighbouring regions but remain constant thereafter.
- The wood supply from industrial freehold is as defined under current management plans and silviculture activity.
- The supply from private woodlots declines slightly in the short term as harvests are currently above estimated sustainable levels. Thereafter the supply increases due to increased silviculture activity.
- 1999 is used as the base year for the wood supply to match the data from the input-output model.

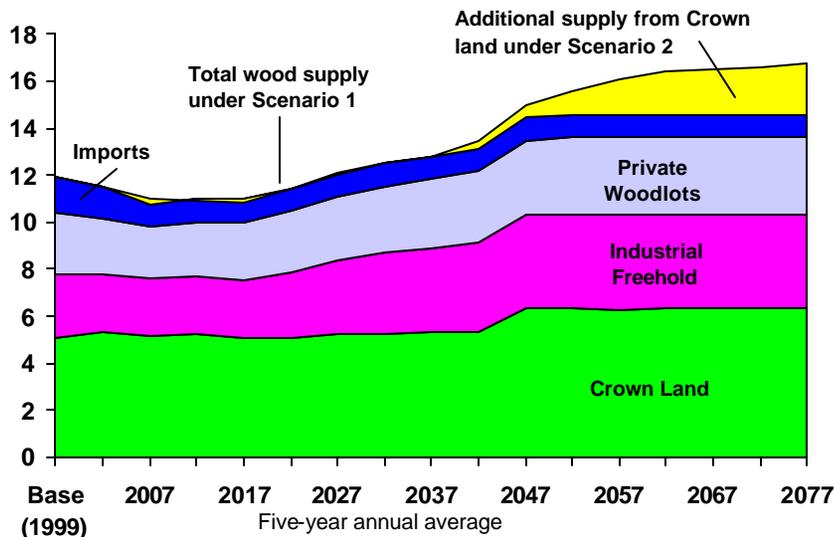
Scenarios

APEC estimated the potential economic impact of the forest industry under two scenarios. By 2062, the total wood supply in New Brunswick will increase by 22% under Scenario 1 and by 37% under Scenario 2.

Scenario 1: The wood supply under this scenario is based on **current policies, management plans and silviculture activities** for Crown land and private land. There is a short-term reduction in wood supply, largely due to a reduction in the harvest on private woodlots and a decrease in imports. Current silviculture spending leads to a long-term increase in the softwood harvest from both industrial freehold and Crown land: In 2062, the harvest on industrial freehold is 68% higher than base year (1999) levels and the harvest on Crown land is 23% higher. The supply from private woodlots recovers over time but imports remain at lower levels. The supply of hardwood is virtually unchanged over the projection period.

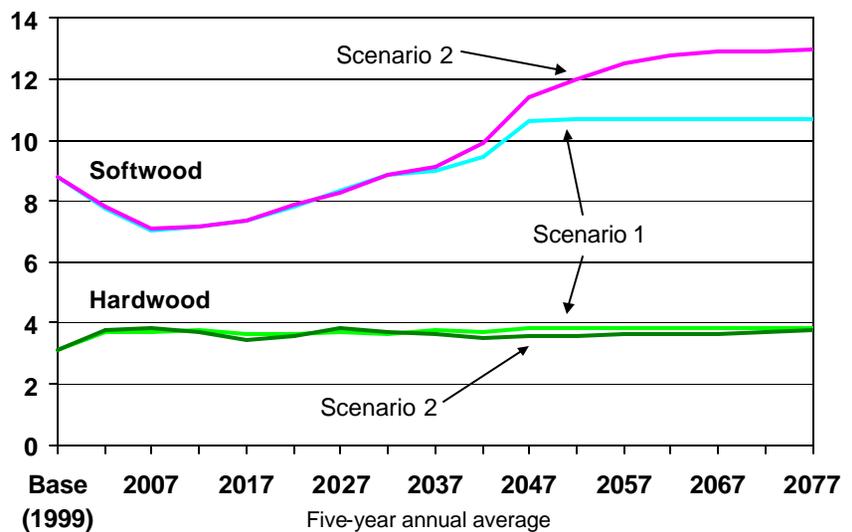
Scenario 2: The wood supply from industrial freehold, private woodlots and imports is the same as in Scenario 1. The hardwood harvest from Crown land is essentially the same as in Scenario 1. The critical difference is that the softwood harvest from Crown land is much higher due to increased silviculture in line with the **Jaakko Pöyry recommendations**. In this scenario, the softwood harvest on Crown land in 2062 is 79% higher than in 1999.

Projected Wood Supply, Scenarios 1 and 2, New Brunswick (million m³/year)



Source: APEC/Jaakko Pöyry

Projected Total Softwood and Hardwood Supply, New Brunswick (million m³/year)



Source: APEC/Jaakko Pöyry

Potential Economic Impact: GDP and Employment

Under Scenario 2, the GDP of the forest industry, including indirect effects, increases by 46% while employment, including indirect effects, is basically unchanged. Under Scenario 1, employment declines substantially.

APEC estimates that the GDP of the forest industry, including its indirect effect on other supply industries, will increase by 29% under Scenario 1. Under Scenario 2, it will increase by 46% to \$3.1 billion. This represents a gain of 17% or \$360 million in output over Scenario 1.

Labour productivity growth in the forest industry and in other sectors dampens the growth in employment. Indeed, in the absence of substantial output growth, employment actually declines.

Under Scenario 1, there is a loss of 850 direct forest jobs and a loss of 1,800 indirect jobs by 2062. Total forest employment, including indirect effects, is therefore forecast to be about 20,750, or about 11% lower than present.

Under Scenario 2, output growth is strong enough for direct employment to rise by 8% or 1,350 new jobs by 2062. Indirect employment declines by 1,250 jobs. Total forest employment, including indirect effects, is estimated to be 23,500, about 100 jobs higher than current levels.

These employment estimates are sensitive to the assumptions made about productivity. If productivity grows faster than assumed here, employment levels will be lower than these estimates. If productivity growth is slower than assumed, employment levels will be higher than these estimates.

Potential Forest Industry Impact: GDP New Brunswick (\$ millions, 2002 prices)

(Includes Direct and Indirect Economic Impact)

	2002	2062	Change from 2002
Scenario 1	2,132	2,758	29%
Scenario 2	2,132	3,119	46%
Incremental Impact		361	17%

Source: APEC

Projected Forest Industry Impact: Total Employment, New Brunswick

(Includes Direct and Indirect Economic Impact)

	2002	2062	Change from 2002
Scenario 1	23,400	20,750	-11.3%
Scenario 2	23,400	23,500	0.4%
Incremental Impact		2,750	11.7%

Source: APEC

Potential Economic Impact: Tax Revenue

Total provincial tax revenues under Scenario 2 are projected to reach almost \$400 million. A substantial portion of this increase represents higher timber royalties from Crown land.

Tax revenues increase as output, labour income and profits all grow. However, the most significant increase is in timber royalties, reflecting the rapid growth in the harvest on Crown land.

Under Scenario 2, total tax revenues are projected to reach about \$394 million or 50% higher than present. These revenues are about \$58 million or 22% higher than under Scenario 1. This incremental gain in tax revenues represents about 1.2% of current provincial government spending.

These estimates are based on the assumption of constant timber prices. If timber prices were to rise in real terms by 0.5% per year, royalties under Scenario 2 would be about \$118 million in 2062, instead of the \$90 million under constant timber prices.

Projected Forest Industry Impact: Provincial Tax Revenues, New Brunswick (\$ millions, 2002 prices)

(Includes both direct and indirect effects)

	2002	Scenario 1 2062	Scenario 2 2062	Incremental Impact	
				S2 - S1	% of 2002
Personal Income Tax	83	104	118	14	17%
Retail Sales Taxes (HST)	55	70	79	9	17%
Royalties	51	66	90	24	48%
Net Indirect Taxes	47	58	65	7	14%
Corporate Income Tax	28	37	41	4	16%
Total	264	336	394	58	22%

Source: APEC

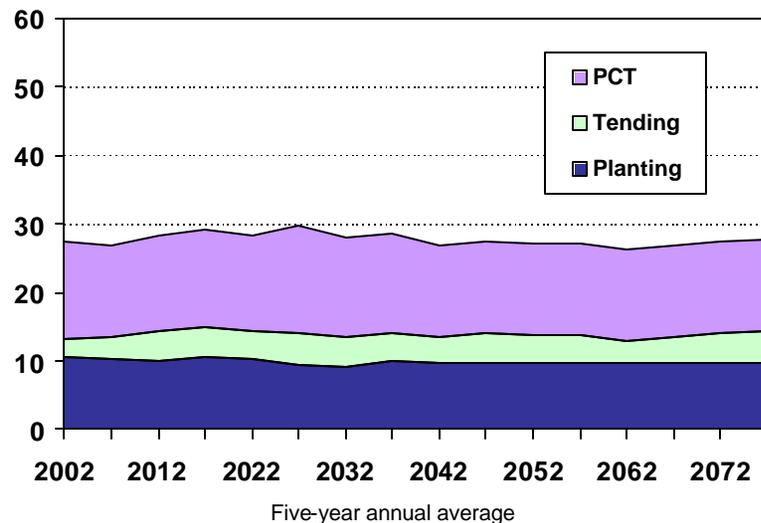
Silviculture Impact: Expenditure

The increase in wood supply from Crown land can only be obtained by a substantial increase in spending on silviculture. Under Scenario 2, annual silviculture expenditures initially double to more than \$50 million, but average about \$35 million in the long-term.

Under Scenario 1, annual silviculture costs average about \$28 million, with the largest amount of spending on pre-commercial thinning (PCT).

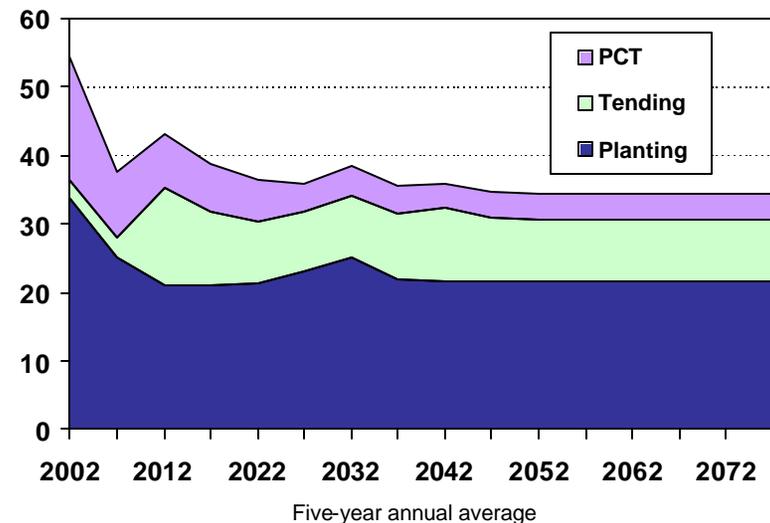
Under Scenario 2, these costs initially double to almost \$55 million, largely due to an increase in softwood planting. Over time, these costs decline to a steady state of about \$35 million per year, about \$7 million or 30% higher than under Scenario 1.

Silviculture Expenditures – Scenario 1
(\$ million)



Source: APEC/ Jaakko Pöyry

Silviculture Expenditures – Scenario 2
(\$ million)



Source: APEC/ Jaakko Pöyry

Silviculture Impact: Funding

The silviculture expenditures required under Scenario 2 amount to an additional \$27 million per year in the first five years eventually reducing to an additional \$7 million per year. Although there are benefits to the province and to industry from making these investments, decisions must be made on the financing of these additional expenditures.

In this regard, some context may be helpful. As a provincial government comparison, the initial \$27 million annual increase is equivalent to about 0.55% of provincial expenditures. On an industry comparison basis, it represents about 0.7% of the value of forest product shipments or about 15% of the annual capital investment made by the forest products industry over the last six years.

This increased silviculture spending provides a direct benefit to the province as labour income accounts for the majority of these expenditures and seedlings are produced within the province. APEC estimates that the increased personal income tax and HST revenues from this spending could amount to between \$2 million and \$2.5 million per year during the first five years.

APEC has estimated the net present value of the increased silviculture expenditures and the resulting rise in tax revenues under Scenario 2. These estimates are shown for various discount rates in the table below.

The internal rate of return - the discount rate at which the net present value is zero – is estimated at between 3.4 and 3.5%. This range reflects the estimated range of values for the amount of income tax and HST revenues accruing to the government as a result of the increased silviculture spending.

Net Present Value of Increased Expenditure and Tax Revenue Streams Under Scenario 2 (2002 prices)

Real Discount Rate	2%	3%	3.4%	4%	5%
Net Present Value (\$ millions)	709	114	0	-84	-155

*These estimates assume, for calculation purposes, that the higher spending is financed by government. They do not take into account changes to other government spending or tax rates to fund the increased silviculture spending and assume that the wood supply remains constant beyond the 80-year projection period.

Source: APEC

Silviculture Impact: Employment

Under Scenario 2, the number of silviculture jobs immediately increases from about 1,150 to 2,000. This provides a significant short-term boost to employment in rural areas.

Under Scenario 1, about 1,150 silviculture jobs are required on average each year. About 60% of these positions are for pre-commercial thinning (PCT).

Under Scenario 2, about 2,000 workers are required annually for the first five years, with almost half of these used for planting. This implies an additional 660 planters and almost 200 workers for pre-commercial thinning.

Silviculture jobs, however, are very seasonal, with planters working on average about 16 weeks a year and those in pre-commercial thinning about 22 weeks a year.

Based on the current distribution of employment in forestry and logging, more than half (55%) of these additional jobs would be in the five most northern counties of the province. This region accounts for almost 40% of the unemployed but has only 30% of the provincial labour force. With some regions already having difficulty attracting forestry workers in the summer months, additional incentives or non-traditional labour sources may be necessary.

After about twenty years, the additional number of silviculture workers required under Scenario 2 is generally 100 or less positions.

Silviculture Employment on Crown Land

Five-year annual average beginning in year

	2002	2007	2012	2017	2022	2027	2032	2037	2042	2047	2052	2057	2062	2067	2072	2077
Scenario 1	1144	1011	1124	1139	1118	1199	1137	1132	1059	1081	1074	1065	1023	1055	1077	1097
Scenario 2	1999	1130	1583	1353	1220	1153	1217	1177	1206	1133	1126	1126	1126	1126	1126	1126
Incremental Jobs Under Scenario 2	854	119	459	214	101	-46	80	44	147	52	52	61	104	72	49	29

Note: Future silviculture employment requirements may be lower than forecast as no allowance has been made for improvements in labour productivity.

Source: APEC/Jakko Poyry

Conclusions

The forest industry is a cornerstone of the New Brunswick economy, providing highly paid employment for thousands of workers and making substantial contributions to output and exports.

The forest industry currently contributes about 5.5% of New Brunswick government revenues. To put these numbers in context, this is equivalent to funding for about 245 full-time nurses, 191 hospital beds, 19 schools and 410 educators. Alternatively, it represents almost the combined budgets of the departments of natural resources, energy, agriculture, fisheries and aquaculture, environment, business, tourism and the regional development corporation.

The Jaakko Pöyry proposals require additional spending on silviculture to increase the long-term wood supply from Crown land.

This increased silviculture spending is more than just an investment in the long-term wood supply. It also provides additional short-term employment for forestry workers. These jobs will provide significant seasonal job opportunities and boost labour incomes in largely rural areas of the province.

The resulting increase in the wood supply is essential for the New Brunswick forest industry to allow continued output growth, to sustain high paying forest sector jobs, and to encourage new investment to support a further shift towards higher value added forest products.

This report has focused on the impact of the long-term increase in the wood supply, particularly the benefits associated with increased harvesting after 2062. However, it is important to point out that this time period is almost 60 years away. As a closing remark, it is important to reinforce that as the wood supply in the province is forecast to be at or below 1999 levels over the next 20-25 years, “more careful attention to increase the short- to mid-term supply is equally, if not more, critical” (JPC, 2002).