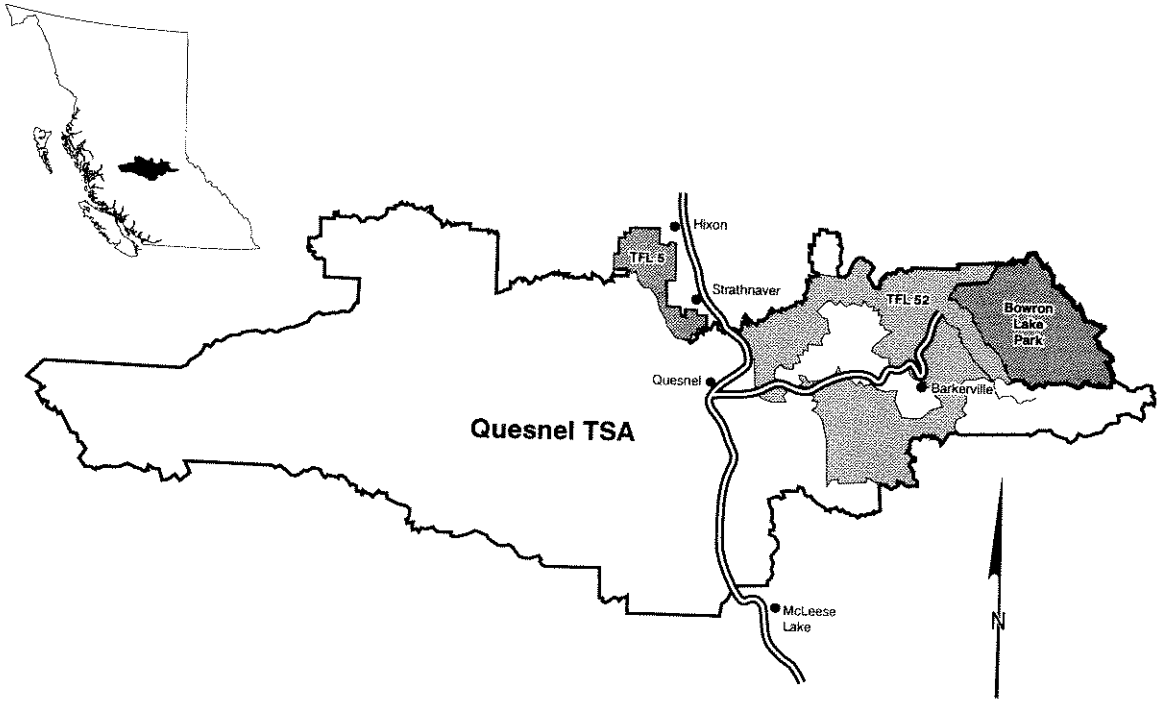
MINISTRY OF FORESTS

Quesnel Timber Supply Area

Timber Supply Review Discussion Paper
March 1995



Province of British Columbia
Ministry of Forests

Quesnel Timber Supply Area

Timber Supply Review Highlights

The Timber Supply Review for the Quesnel Timber Supply Area began in September 1993. The Cariboo-Chilcotin Land Use Plan, announced in October, 1994, could not be taken into account in this review. It may be possible to assess the timber supply impacts of the Land Use Plan in the Quesnel Timber Supply Area before the maximum five-year period required by the *Forest Act*.

- The British Columbia Forest Service is reviewing the timber supply in all timber supply areas* and tree farm licence* areas in the province. This review examines the impacts of current forest management practices* on the timber supply*, economy, environment and social conditions of the local area and the province. Based on the results of this review, the chief forester may decide to maintain or adjust the allowable annual cut* for the Quesnel Timber Supply Area.

- The current allowable annual cut in the Quesnel Timber Supply Area, set in 1992, includes two million cubic metres per year for sawlogs, 300,000 cubic metres per year for problem forest types* and 50,000 cubic metres per year for predominantly deciduous forests. (page 5)

- Timber harvesting and processing in the Quesnel Timber Supply Area supports four major sawmills, one plywood mill, two pulpmills, several independent sawmill operations and several value-added manufacturing plants. Approximately 2,017 person-years* of direct forestry employment are estimated to be created in the local area. An estimated total of 5,155 person-years of employment is created provincially. (page 6)

- The base case timber supply forecast indicates that, based on forest management practices being implemented in 1993 when the analysis was initiated, the current sawlog and problem forest type* allowable annual cut can be maintained for approximately 70 years before declining to the long-term timber supply level of 1,955,500 cubic metres per year. (page 8)

- The sawlog timber supply is closely related to the amount of mature timber available for harvesting. The rate of harvesting problem forest types and pulpwood may limit the availability of sawlog timber in the short-term. (page 9)

- Management practices in the critical caribou habitats affect the amount of mature timber available for harvesting. Target management objectives for these areas are currently being considered in the Land Use Plan implementation process. (page 10)

- Other integrated resource management practices which may also affect the timber supply include:
  - modified harvesting practices in critical deer winter ranges
  - the amount of older forests that must be reserved from harvesting at any time
  - management practices being developed in Local Resource Use Plans and for the visual quality zone
  - the amount of area within and the appropriate practices for the streams and lakeshores zone (pages 10-11)

- Opportunities may exist to increase the timber supply by:
  - improving timber recovery from harvested areas
  - developing special harvesting practices for environmentally sensitive areas
  - implementing a commercial thinning program
  - intensive silvicultural treatments (page 11)

- Preliminary analyses indicate between 24,300 and 45,200 cubic metres could be harvested annually, over the long term, from predominantly deciduous forests in the timber supply area. Several factors influence the available deciduous timber supply:
  - estimates of merchantable timber
  - natural transition of deciduous forests to coniferous forests
  - impact of integrated resource management practices, particularly in riparian areas
  - deciduous timber in predominantly coniferous forests (page 11)

- The chief forester must determine an allowable annual cut as part of a strategy to achieve the projected long-term sustainable timber supply level. The base case forecast provides one alternative, but the chief forester could select another harvest level based on his consideration of the factors required under Section 7 of the *Forest Act*.

* **Throughout this document, an asterisk at the end of a phrase indicates the phrase is defined in the definitions section on the back of this page.**

Definitions

Allowable annual cut
The rate of timber harvest permitted each year from a specified area of land, usually expressed as cubic metres of wood per year.

Base case forecast
The timber supply forecast that illustrates the effect of current forest management practices on the timber supply using the best available information.

Cariboo-Chilcotin Land Use Plan
A government decision on land use in the Cariboo-Chilcotin which was developed in consultation with stakeholders with consideration of the recommendations of the Commission on Resources and Environment (CORE).

Commission on Resources and Environment (CORE)
An independent commission established to develop regional land use recommendations in consultation with stakeholders.

Current forest management practices
Forest practices that were being approved and implemented in the area when this review was initiated. These practices are described in this paper beginning on page 6.

Environmentally sensitive areas
Areas identified as requiring special management to protect important recreation and scenic values, fisheries resources, sensitive soils and unstable slopes.

Forest licence
An agreement with the provincial government which grants a private interest the right to harvest a specific volume of timber each year from Crown land within a timber supply area.

Forest Practices Code
A law which requires better forest practices, with heavy penalties for violators. Present plans call for implementation of the Code in the coming months.

Integrated resource management
The identification and consideration of all resource values, including social, economic and environmental needs, in resource planning and decision-making.

Land and Resource Management Plan
A consensus-building process involving a cross section of the public, interest groups and government agencies, to establish resource management objectives and strategies for a management unit.

Partitioned cut
Specific portions of an allowable annual cut assigned to a particular type of timber or terrain.

Person-year
One person working the equivalent of one full year. If someone works full time for six months, he or she accounts for 0.5 person-years.

Problem forest types
Forests that are not included in the timber harvesting land base because they have not been economical to harvest for sawlogs in the past. In the Quesnel Timber Supply Area, problem forest types are mainly dense, small-diameter pine forests in the western portions of the area. Some of these forests are currently being harvested for sawlogs.

Protected Areas Strategy
A provincial initiative to protect representative ecosystems and special features on a regional basis.

Pulpwood Agreement
An agreement between a private interest and the provincial government which permits harvesting of specified forest types in special circumstances when it is necessary to supplement wood supplies.

Riparian areas
The stream bank and flood plain adjacent to streams or water bodies.

Timber harvesting land base
Crown forest land within the timber supply area that is currently considered feasible and economical for long-term timber harvesting.

Timber supply
The volume of timber available for harvesting over time, under a particular management regime.

Timber supply area
An area of Crown land defined in accordance with the *Forest Act* primarily by an established pattern of wood flow from the forest to the primary timber-using industries.

Tree farm licence
An agreement entered into with the provincial government which provides for the establishment, management and harvesting of timber by a private interest on a defined area of Crown land in accordance with the *Forest Act*.

Quesnel Timber Supply Area

Introduction

The British Columbia Forest Service is reviewing the timber supply in all timber supply areas* and tree farm licence* areas in the province. The objectives of this three-year review are to:

- identify the economic, environmental and social consequences of existing forest management practices—including their impacts on the short- and long-term timber supply
- identify where improved information is required to make reliable forecasts
- provide the chief forester with information to make necessary adjustments to the allowable annual cuts for the next five years

This discussion paper summarizes the technical reports for the Quesnel Timber Supply Area and encourages British Columbians to comment on the findings. Public comments will be accepted until June 1, 1995. You will find a response form at the end of this paper to help you provide input.

Background to the Timber Supply Review

For at least 20 years, governments have known that British Columbia's timber supply would decline in the future—we could not keep cutting at the rate we've been going. Now there is an urgent need for up-to-date information to review the timber supply and allowable annual cuts throughout the province.

A study completed in 1991 by the Forest Service, *A Review of the Timber Supply Analysis Process for British Columbia,* examined the procedures which led to the determination of allowable annual cuts, and confirmed the need for change.

The study found that:

- existing allowable annual cuts were based on outdated information and management practices
- procedures failed to fully account for integrated resource management practices and protection of non-timber values
- procedures were far too time-consuming
- analytical techniques had to be strengthened

As a result of these procedural weaknesses, very few timber supply analyses had been completed since the early 1980s, with few allowable annual cut adjustments.

The Forest Service acted quickly on the study's recommendations. The Timber Supply Review was initiated to assess short- and long-term timber supplies in light of current forest practices and integrated resource management goals.

The chief forester's responsibility

Determining the allowable annual cuts for Crown forest lands in British Columbia is the responsibility of the province's chief forester. It is one of the chief forester's most important responsibilities since it affects the local and provincial economy and environment — now and in the future. Section 7 of the *Forest Act* requires the chief forester to consider the following factors to determine allowable annual cuts for timber supply areas and tree farm licences:

a) the rate of timber production that may be sustained from the area, taking into account:
   - the composition of the forest and its expected rate of growth
   - the time in which the forest will become re-established
   - silvicultural treatments, including reforestation
   - standards of timber utilization

Towards a sustainable future

British Columbians agree there is a need for sustainable resource management to ensure a strong forest economy, viable communities and a healthy environment—today and always. The Timber Supply Review is one of several government initiatives designed to help achieve sustainability:

- The *Forest Renewal Plan* is a partnership of all the forest interests, working together to invest in increasing the value of the forests and strengthening the forest sector economy.
- The *Forest Practices Code* creates a single enforceable law to require better forest practices, with heavy penalties for violators.
- The *Timber Supply Review* is providing up-to-date information to adjust allowable annual cuts to ensure the sustainability of British Columbia's forests.
- The *Commission on Resources and Environment,* the *Protected Areas Strategy,* and *Land and Resource Management Plans* are moving to integrate all values into land-use planning in an effort to end confrontation and valley-by-valley battles.
- The *B.C. Treaty Commission* is moving us toward fair and equitable settlements of treaties which can create long-term social and economic stability for aboriginal and non-aboriginal British Columbians.

- constraints on the amount of timber produced from the area due to use of the forest for purposes other than timber production
- any other information which relates to the capability of the area to produce timber

b) the short- and long-term implications to the province of alternative rates of timber harvesting from the area
c) the nature, production capabilities, and timber requirements of established and proposed processing facilities
d) the economic and social objectives of the Crown for the area, the region and the province, as expressed by the minister of forests
e) abnormal insect or disease infestations and major salvage programs planned for the timber on the area

Some of these factors can be measured and analyzed — others cannot. Ultimately, the chief forester's determination is an independent, professional judgment based on the best information that is available. By law, the chief forester is independent of the political process and is not directed by the minister of forests when determining allowable annual cuts. In these determinations the chief forester considers relevant information from any source, including interest groups. However, these determinations cannot be inappropriately influenced by the advocacy efforts of any group.

Timber Supply Review process

The Timber Supply Review is an improvement over past methods, with better information and superior analytical techniques. The process was designed to stimulate public discussion through the release of reports and this discussion paper, and to accommodate new information, techniques and ideas.

Figure 1 illustrates the five-step process that has been developed for the Timber Supply Review in timber supply areas. The diagram also indicates the status of the Timber Supply Review for the Quesnel Timber Supply Area and the estimated time required to complete each step in the process.

As the legal mandate for allowable annual cut determinations for tree farm licence areas is the same as for timber supply areas, the Timber Supply Review process for tree farm licences is based on similar principles, but it has been designed to reflect the management role of these licensees. In the past, tree farm licences have not included specified timelines for licensees to prepare the information needed by the chief forester to determine allowable annual cuts for these areas. To reflect changing forest management standards, replacement tree farm licences specify timelines for preparing information.

A commitment to incorporate change

The *Forest Act* requires the chief forester to reassess the allowable annual cut for each timber supply area and tree farm licence area at least every five years after this review is completed to incorporate new information, new practices and government policies. Where major government initiatives prompt changes in land use designations or forest management practices which significantly impact the timber supply, the chief forester may decide to determine allowable annual cuts more frequently than every five years.

Forest Practices Code

A *Forest Practices Code Act* for British Columbia was passed in the Legislature in July, 1994. This law

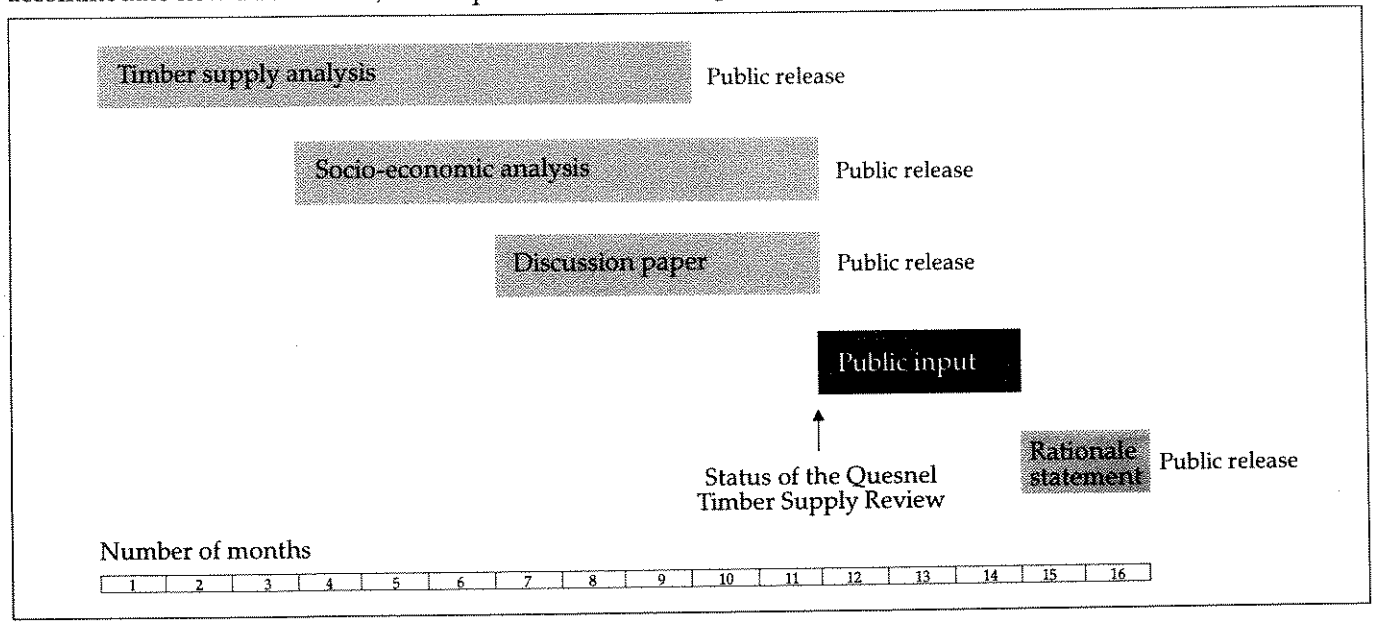


Figure 1 Steps in the Timber Supply Review process

requires better forest practices throughout the province and establishes heavy penalties for violators. When the Code is fully implemented, forest management practices will be changed to meet its requirements. These new practices may influence both short- and long-term timber supply.

Since the information was prepared for the Timber Supply Review, some practices have been implemented in the Quesnel Timber Supply Area based on current understanding of the intentions of the Code. Information about these practices will be provided to the chief forester for consideration in this allowable annual cut determination. However, further implementation and experience with the Code will be required before the effect of new practices on the timber supply can be properly assessed, making it necessary to incorporate these factors in future allowable annual cut determinations.

Cariboo-Chilcotin Land Use Plan

On October 24, 1994, the government of British Columbia announced a Land Use Plan for the Cariboo-Chilcotin region. This Land Use Plan doubled the Protected Areas where commercial timber harvesting will not be permitted to 12 per cent of the Cariboo-Chilcotin.

Eighty per cent of the region was dedicated to the commercial resource land base within the following zones:

- Enhanced Resource Development Zone (40 per cent)
- Special Resource Development Zone (26 per cent)
- Integrated Resource Management Zone (14 per cent)

The remaining eight per cent of the regional land base is Private/Settlement lands.

The Land Use Plan includes broad management objectives for each zone and specific targets for some resources. For example, a timber management target was defined for the Special Resource Development Zone: "the forest industry will have access to 70 per cent of the timber from the productive forest land base averaged over the zone." An implementation process will establish detailed objectives and the remaining targets for each resource in each zone in early 1995.

Until this plan is fully implemented and practices are adjusted in the field, the timber supply impact of the Land Use Plan cannot be measured. This Timber Supply Review will be used as the foundation for determining the actual impacts of the Land Use Plan once it is implemented. The next Timber Supply Review will be based on experience with the Land Use Plan gained during the implementation period.

There are similarities between the information used in this Timber Supply Review and the Land Use Plan:

- some overlap exists between the new Protected Areas and the areas where harvesting has not been occurring under current practices and that were deducted from the land base for the timber supply analysis
- considerable overlap exists between the objectives for the Special Resource Development Zone and the practices that were analyzed for the special management zones in the timber supply analysis

A new initiative promoted by the Land Use Plan is the establishment of targets for timber resource enhancement. This was not considered in the timber supply analysis.

For this Timber Supply Review, the Land Use Plan provides the chief forester with an expression of government's commitment to achieve the Crown's social and economic objectives for the region and the Quesnel Timber Supply Area.

Implementation of the Land Use Plan has already started. If it becomes apparent that the Plan has modified the timber supply to such an extent that the allowable annual cut is no longer consistent with the plan, the chief forester is prepared to reassess the timber supply and to redetermine the allowable annual cut based on Section 7 of the *Forest Act*. The chief forester is also prepared to investigate the possibility of implementing other more expedient procedures under the *Forest Act* to adjust the allowable annual cut if necessary.

It may be possible to assess the timber supply impacts of the Land Use Plan in the Quesnel Timber Supply Area before the maximum five-year period required by the *Forest Act*.

Timber Supply Review in the Quesnel Timber Supply Area

Forest Service staff in the Quesnel Forest District finalized the data used for the Quesnel Timber Supply Area timber supply analysis in March 1994. This data is available for public review at the Quesnel Forest District Office.

The Forest Service then conducted and released a short- and long-term timber supply analysis (*Quesnel Timber Supply Analysis*, December, 1994); this technical report includes an abbreviated version of the data used in the analysis. A socio-economic analysis of the timber supply forecasts has also been completed (*Quesnel Timber Supply Area: Socio-Economic Analysis*, March, 1995). Both reports are available from the

Quesnel Timber Supply Area

Quesnel Forest District office and the Cariboo Forest Region office in Williams Lake.

As the Cariboo-Chilcotin Land Use Plan and the Forest Practices Code did not exist when preparation for the timber supply analysis for the Quesnel Timber Supply Area began in 1993, the Timber Supply Analysis Report and the Socio-Economic Analysis do NOT include the land use decisions and changes in forest practices resulting from these initiatives.

This discussion paper summarizes the two technical reports and highlights critical factors the chief forester must consider to determine the allowable annual cut for the Quesnel Timber Supply Area. In conjunction with the release of this discussion paper, Forest Service staff will actively solicit public input to ensure the information in the Timber Supply Review is correct. Input will be accepted until June 1, 1995, and will be summarized in a report to the chief forester and the minister of forests.

After considering all the available information, the chief forester will determine the allowable annual cut for the Quesnel Timber Supply Area in the summer of 1995. This determination and a *Rationale Statement* for the determination will be released along with the *Summary of Public Input.*

Throughout this discussion paper, the page numbers from the technical reports are provided so you can refer to them for additional information (*TSAR* is the *Quesnel Timber Supply Analysis Report*, and *SEA* is the *Quesnel Timber Supply Area: Socio-Economic Analysis*).

Description of the Quesnel Timber Supply Area

The Quesnel Timber Supply Area is located in the Fraser Basin and the Interior Plateau, between the Coast Mountains on the west and the Cariboo Mountains on the east. West of the Fraser River, the flat to gently rolling plateau is dissected by the Blackwater River system. In the east, the Quesnel Highlands gradually rise to meet the Cariboo Mountains.

Forest resources

Timber

The forests in the Quesnel Timber Supply Area contain many tree species. For the timber industry, the most important tree species is lodgepole pine; minor amounts of spruce and Douglas-fir also occur. The trees in some of the lodgepole pine forests are very dense, relatively short and have small diameters. Since the 1989 timber supply analysis was completed, a portion of these pine forests have been harvested and processed by local sawmills. This has substantially reduced the area of these forests, locally known as problem forest types, that are considered uneconomical to harvest in this timber supply review.

Figure 2 illustrates the classification of the land within the Quesnel Timber Supply Area. Approximately 61 per cent of the area is included in the timber harvesting land base — the area where timber harvesting is economical and feasible based on current integrated resource management practices. (*TSAR* page 6)

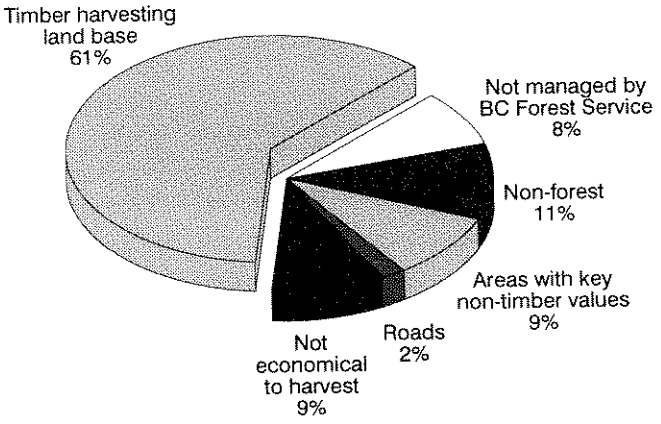


Figure 2 Classification of the land within the Quesnel Timber Supply Area

Notes: Total area: 1.65 million hectares
Areas with key non-timber values that were deducted from the timber harvesting land base for the timber supply analysis include the Alexander Mackenzie Heritage Trail, the Cariboo River Wildlife Management Area, and caribou and critical mule deer habitat.

Recreation

Parks, recreation sites and trails, and roaded and non-roaded areas provide opportunities for an assortment of outdoor experiences in the timber supply area. Two large provincial parks (Tweedsmuir and Bowron) and other smaller provincial parks, as well as 32 ministry of forests recreation sites and 21 recreation trails, are located either in or near the timber supply area. The Carrier Nuxalk Grease Trail, a designated heritage trail, traverses the western half of the timber supply area and the Wells-Barkerville areas in the eastern half of the timber supply area are well-known for their extensive mining history. (*SEA* page 16)

Quesnel Timber Supply Area

Wildlife and fisheries

A wide variety of wildlife species inhabit the Quesnel Timber Supply Area because of its diverse soils, climate and topography. Several features within the timber supply area are provincially significant. The Blackwater River has a unique, wild strain of rainbow trout and is a popular fishing destination. Many of the streams in the area have either critical or moderate value as fisheries spawning and rearing habitat. Two provincially significant caribou herds are located in the Itcha-Ilgachuz Mountains and the Quesnel Highlands. Other species include mule deer, cougars, moose, black bears, grizzly bears, coyotes, wolves and other fur-bearing mammals. The wide range of wildlife in the area provides the basis for wildlife viewing, guided hunting and fishing, trapping and other economic activities. (*SEA* page 21)

Range

The grasslands and open forests in the area provide forage for a beef cattle ranching industry. These operations are highly dependant on public rangelands to meet their forage requirements. (*SEA* page 17)

Current allowable annual cut

The current allowable annual cut, determined in 1992, is partitioned* into three components:

- **sawlogs**
  The current allowable annual cut for sawlogs is two million cubic metres per year. Approximately 72 per cent of the total sawlog cut is allocated to long-term timber tenures and 21 per cent to the Small Business Forest Enterprise Program administered by the Forest Service. Approximately four per cent is allocated to temporary tenures, two per cent is held in woodlot licences and one per cent is unallocated.

  Because the allowable annual cuts for woodlots are determined separately, the land base within woodlots was not included in the timber harvesting land base for this analysis. Consequently, the 34 500 cubic metres per year that is allocated to woodlots was not included in this review.

- **problem forest types**
  In the 1989 timber supply analysis, dense, small-diameter pine forests that historically had not been harvested for sawlogs were deducted from the timber harvesting land base in the western portions of the timber supply area. Some time later, changes in harvesting and milling technology prompted local timber companies to propose harvesting some of these forests. In 1990, an interim allowable annual cut of 400,000 cubic metres per year was established for problem forest types. The chief forester reduced this cut to 300,000 cubic metres per year in 1992.

  Currently 273,000 cubic metres per year are allocated for harvesting problem forest types through three temporary licences that expire in 1998. The remaining 27,000 cubic metres per year are harvested through the Small Business Forest Enterprise Program.

- **deciduous**
  The separate allowable annual cut of 50,000 cubic metres per year for harvesting in predominantly deciduous forests has not been allocated, nor has any significant harvesting been authorized from these forests. A separate analysis has been completed for the predominantly deciduous timber supply.

Note: Because the woodlots and predominatly deciduous forests are not included in the land base for the sawlog timber supply analysis, the allowable annual cut used in the timber supply analysis is 2,265,500 cubic metres per year.

In addition to the timber harvesting rights allocated under the allowable annual cut, one pulpwood agreement* also covers portions of the Quesnel Timber Supply Area. This pulpwood agreement permits timber harvesting in special circumstances when it is necessary to supplement wood supply. To date, no harvesting under this agreement has occurred. However, recently it has been suggested that declining chip supplies and the fibre requirements of the new medium density fibreboard plant may prompt harvesting. Because there had not been any harvesting under this agreement, pulpwood harvesting was not considered a current practice and was not included in the timber supply analysis.

Socio-economic profile

The population of the Quesnel Timber Supply Area, as reported in the 1991 census, is estimated at 22,860 (*SEA* page 4). The City of Quesnel and its suburbs have the largest population of approximately 8,179.

First Nations

Six First Nations bands have historical interest in the Quesnel Timber Supply Area. Their total population is approximately 1,598 members and approximately 1,127 of them live on reserves within the Quesnel Timber Supply Area. Three tribal councils (the Carrier Chilcotin Tribal Council, the Cariboo Tribal Council

and the Tsilhqot'in Tribal Council) represent five of the bands. The Nazko band is not currently affiliated with a tribal council. Approximately five per cent of the adult First Nations population that is available for work are employed in the forest industry. (*SEA* page 8)

Local economy

The economy of Quesnel and the timber supply area is primarily forestry dependent. The services sector, public sector, tourism, agriculture, and mining also contribute to the economy (Figure 3). (*SEA* page 12)

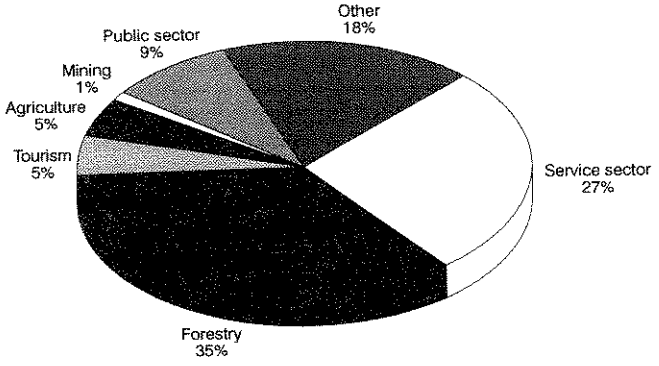


Figure 3 Local employment in each economic sector

Employment in the service sector is created through the spending of wages and salaries earned in the other sectors. Thus, the employment in the service sector can be divided among the other sectors based on the portion of income each sector creates. Adding the portion of service sector employment dependent on forestry wages and salaries to forest sector employment reveals that forestry activity in the Quesnel Timber Supply Area supports approximately 45 per cent of the area's total employment. This indicates a relatively undiversified economy. (*SEA* page 13)

Forest sector

Four major sawmills, one plywood mill, two pulpmills and a number of small independent sawmill operations are located in the Quesnel Timber Supply Area. In addition, several value-added manufacturing plants are operated, either by the major mills, as joint ventures with First Nations companies or as independent companies. A new medium density fibreboard plant is also planned for the area. The sawmills secure 74 per cent of their timber supply from the Quesnel Timber Supply Area; pulpmills secure 46 per cent. (*SEA* page 31)

Harvesting and processing the current allowable annual cut from the Quesnel Timber Supply Area generates an estimated 2,017 person-years of direct employment and 2,904 total person-years of employment within the area. (*SEA* page 36)

Provincial economy and revenues

In total, harvesting and processing the allowable annual cut in the Quesnel Timber Supply Area is estimated to generate approximately 5,155 person-years of employment in the province, 56 per cent of which is created within the timber supply area.

Approximately $64.0 million in provincial revenues is generated annually by timber harvesting in the Quesnel Timber Supply Area. This figure is based on the average total fees for harvesting public timber in the area ($15.33 per cubic metre based on 1993 information), plus estimated personal income taxes and other tax revenues. These estimates do not include the increased stumpage revenues being generated to fund the Forest Renewal Plan. While, on a provincial basis, stumpage revenues are expected to increase by as much as 80 per cent, it will not be possible to accurately estimate the impact of this change until the new policy has been in place for a period of time.

Current management practices

Public forest lands in British Columbia provide recreational enjoyment, fish and wildlife habitat, water supplies, timber resources and many other benefits. The Forest Service manages the forest, range and recreation resources on public lands. The Ministry of Environment, Lands and Parks is responsible for the management of fish, wildlife and water resources and parks. Both agencies subscribe to the principle of integrated resource management, where all resources are considered before management decisions are made.

The timber supply analysis was based on the best available information about current management practices—those practices being approved and implemented in the Quesnel Timber Supply Area in December, 1993, when the timber supply analysis was initiated. These practices are briefly described below. Readers are encouraged to review the *Quesnel Timber Supply Analysis Report* (pages 11-12 and Appendix A) for more detailed information.

Management zones

For the timber supply analysis, Forest Service staff grouped areas where similar integrated resource management practices are implemented into management zones. This approach permits analysis of the different types of forests and the range of practices in the Quesnel Timber Supply Area. The area in each zone was estimated from existing plans

and guidelines for integrated resource management in the timber supply area. The site specific practices implemented in any one area may differ from the practices used in the analysis.

Figure 4 illustrates the area within each of the zones. The information used in the analysis to describe the integrated resource management practices in each zone is described below.

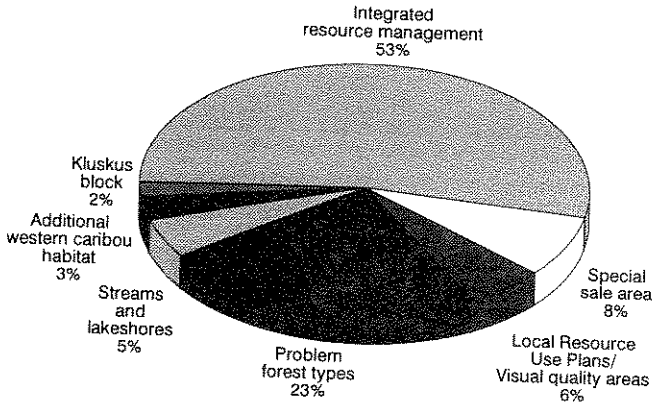


Figure 4 Area within each management zone

- **Additional western caribou zone** (34,543 hectares) — important caribou habitat identified in 1992 through a habitat research project managed jointly by the Forest Service and the Ministry of Environment, Lands and Parks. This area is in addition to the 79,976 hectares of critical habitat, where timber harvesting is deferred, that was deducted from the timber harvesting land base. In this zone, a maximum of 25 per cent of the area is permitted to have forests less than three metres tall at any time, and at least 25 per cent of the forest must be at least 120 years old at any time.

- **Special sale area zone** (83,880 hectares) — areas near the city and suburbs of Quesnel and along the Fraser River where current recreational use and the proximity to city and rural residents require specific forest management practices. To manage for recreational use, a maximum of 25 per cent of the area is permitted to have forest cover less than three metres tall at any time, and at least 10 per cent of the forest must be at least 150 years old at any time.

- **Local Resource Use Plans and visual quality zone** (61,216 hectares) — areas with special management practices, particularly for visual quality and recreation, such as the Lower Blackwater Local Resource Use Plan area, the Upper Blackwater Local Resource Use Plan area, the Cariboo River Wildlife Management Area Buffer Zone B, the Quesnel-Barkerville Integrated Resource Management Plan area, and other areas requiring visual resource management. In this zone, a maximum of 15 per cent of the area is permitted to have forest cover less than three metres tall at any time, and at least 15 per cent of the forest must be at least 150 years old at any time.

- **Streams and lakeshores zone** (44,505 hectares) — includes approximately 30 metres either side of all streams, rivers and lakes that are identified on existing forest cover maps. In this zone, a maximum of 25 per cent of the area is permitted to have forest cover less than three metres tall at any time, and at least 20 per cent of the forest must be at least 150 years old at any time.

- **Kluskus supply block** (22,286 hectares) — the portions of the Kluskus Supply Block in the western part of the timber supply area not already covered by other zones or deductions. This area is currently undeveloped. For the purposes of the timber supply analysis, it was assumed that if harvesting were implemented, a maximum of 25 per cent of the area would be permitted to have forest cover less than three metres tall at any time, and at least 15 per cent of the forest must be at least 120 years old at any time.

- **Integrated resource management zone** (535,290 hectares) — areas within the timber harvesting land base not included in the other management zones. Management in this zone is based on the current *Cariboo Forest Region Harvesting Guidelines* which stipulate a maximum of 33 per cent of the area is permitted to have forest cover less than three metres tall at any time, and at least 10 per cent of the forest must be at least 150 years old at any time.

- **Problem forest types zone** (236,238 hectares) — a portion of the forests that was not considered merchantable for sawlog harvesting for the last timber supply analysis in 1989 and that was not included in the timber harvesting land base at that time. As in the integrated resource management zone, a maximum of 33 per cent of the area is permitted to have forest cover less than three metres tall at any time. At least 10 per cent of the forest must be at least 120 years old at any time.

Current practices

The current forest management practices that are approved and implemented in all of the zones are briefly described below.

- **Basic silviculture** — British Columbia laws require that areas which are harvested and expected to produce timber in the future must be reforested with ecologically acceptable species within a specified time frame. The typical silvicultural practice is to harvest by clearcutting, prepare the

site if needed, plant and/or encourage natural regeneration to provide a mix of species, and brush to remove competing vegetation if needed. It is assumed that areas that are clearcut will be restocked within four to seven years, depending on the regeneration method.

- **Rehabilitating problem forest types** — Following harvesting, areas with problem forest types are reforested and managed to produce sawlog quality timber, thus increasing the size of the sawlog timber harvesting land base in the future.

- **Harvest ages** — Minimum harvest ages are set to define the time it takes for forests to grow to harvestable size. The minimum harvest ages used in the timber supply analysis vary by tree species: 80 years for lodgepole pine and 120 years for all other species.

- **Timber utilization** — Within areas clearcut for sawlogs, all coniferous trees that are greater than the following dimensions and can be manufactured into lumber must be removed:
  - 10 centimetre top diameter
  - 12.5 centimetre diameter at chest height for lodgepole pine
  - 17.5 centimetre diameter at chest height for other species

  The utilization standards for problem forest types vary with each licence but in all cases they are more intensive than those for sawlog harvesting. For the purposes of the timber supply analysis, the following standards were used:
  - 8.9 centimetre top diameter
  - 10.5 centimetre diameter at chest height

- **Soil conservation** — Harvesting and road construction follow regional and provincial guidelines. For the timber supply analysis, it is estimated that approximately 3.3 per cent of the timber harvesting land base will become unproductive due to roads and some landings. This estimate is based on studies of local conditions.

- **Forest health and unsalvaged losses** — Losses of timber to fire, wind damage, insects and disease are minimized through an extensive salvage program. However, all the killed or damaged timber is not currently salvaged: annual losses are estimated to be 25,000 cubic metres.

Timber supply forecasts and critical factors

It is important to note that the timber supply forecasts presented in the analysis report and in this paper do not represent either a short-term allowable annual cut determination or a long-term strategy to adjust harvest levels. The base case forecast and the critical factors described below are part of the information the chief forester will use to determine the allowable annual cut for up to the next five years.

The timber supply forecasts and critical factors for the sawlog forests and problem forest types, and the predominantly deciduous areas, are assessed separately in this section.

Sawlog and problem forest type timber supply

Base case forecast

To complete the timber supply analysis for the Quesnel Timber Supply Area, a computer model was used to produce a base case* timber supply forecast that met all of the following conditions:
- the current allowable annual cut was maintained for as long as possible, or if this was not possible, the highest initial harvest level was found, then,
- if significant reductions were required, the forecasted harvest level were reduced by eight to 12 per cent per decade until the long-term timber supply level was reached
- the timber supply level was maintained at or above the predicted long-term level

Using the best information available about the management practices being implemented when the timber supply analysis was initiated in 1993, the base case* timber supply forecast for the Quesnel Timber Supply Area indicates the current allowable annual cut of 2,265,500 could be maintained for approximately 70 years before declining to the long-term level of 1,955,500 cubic metres per year (Figure 5).

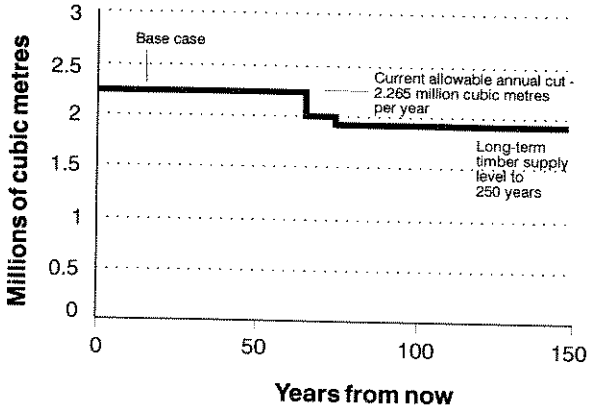


Figure 5 Base case timber supply forecast

Examining critical factors

Since early 1994 when the data was finalized for the timber supply analysis, Forest Service staff have been collecting more information for some of the factors in the analysis. Also, tests completed during the timber supply analysis identified which factors had the greatest effect on the timber supply forecasts. These critical factors are discussed in this section.

The chief forester must carefully evaluate this information when assessing the allowable annual cut and identifying where improved information is needed. We encourage you to do the same.

A. Amount of mature timber available

- **Estimates of mature timber**
  A test of the impact of changing the estimates of mature timber in the existing forests in the Quesnel Timber Supply Area (Figure 6) indicates the timber supply forecast is closely related to these estimates. (*TSAR* page 29)

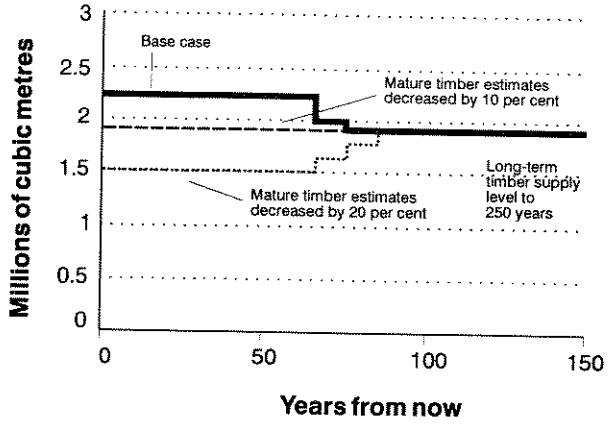


Figure 6 Impacts of changes in estimates of mature timber

These tests indicate the immediate timber supply depends to a great degree on the amount of mature timber available for timber harvesting in the short-term. Further work is required to ensure the accuracy of these estimates.

- **Area of problem forest types**
  In the Quesnel Timber Supply Area, it is important to identify the forests that are feasible and economical to harvest for sawlogs versus problem forest types that are not considered economical to harvest for sawlogs. The current definition of problem forest types is based on an estimate of the minimum volume in each tree (0.1 cubic metres) that can be harvested economically. Forests with trees below this size are not included in the problem forest types. This definition may not adequately define the area that is economical to harvest as problem forest types. An increase or decrease in the amount of problem forest types may impact the projected timber supply.

- **Pulpwood harvesting**
  Harvesting under the pulpwood agreement may affect the availability of mature timber for sawlog harvesting by creating cutover areas that must be reforested and reach three metres in height before adjacent sawlog forests can be harvested. Because harvesting has not occured under this agreement in the past, this was not considered to be a current practice and was not assessed in the timber supply analysis.

  It is also possible that a portion of the problem forest types will be required to be harvested as pulpwood to fulfill the commitments of the pulpwood agreements. This may affect the timber supply available for the problem forest type component of the allowable annual cut.

B. Current management practices

- **Critical caribou habitats**
  A primary emphasis of management practices in critical caribou habitat in this timber supply area is to maintain stable caribou populations. The management practices used in the timber supply analysis are the result of local agreements on appropriate practices:

  - **western caribou critical habitat**
    The western caribou habitat includes approximately 114,543 hectares within the timber harvesting land base in the Itcha Ilgachuz area in the western portion of the timber supply area. The existing agreement between the Forest Service and the Ministry of Environment, Lands and Parks is to defer harvesting on approximately 80,000 hectares of critical caribou habitat and to study methods of integrating

timber harvesting and habitat requirements in this area until the end of 2008. During this period, timber harvesting will only be permitted for study purposes or under special circumstances.

The remaining western caribou habitat is not subject to a harvesting deferral but does require special management to accommodate caribou habitat needs.

As a result, for the timber supply analysis, the western caribou critical habitat area was divided into two portions: approximately 80,000 hectares that were deducted from the timber harvesting land base for this analysis, and 34,543 hectares where restricted timber harvesting is permitted.

- **eastern caribou critical habitat**
  The eastern caribou critical habitat area occupies 23,000 hectares within the timber harvesting land base in the Quesnel Highlands on the eastern edge of the timber supply area. The caribou that inhabit this area range into Bowron and Wells Gray Park as well.

  There is not currently a local agreement regarding management of this area. Agreement exists on the general location of the habitat area and the importance of critical habitat, but not on the boundaries of this habitat or how it should be managed. As a result, this area was removed from the timber harvesting land base for the timber supply analysis.

Target management objectives, and the boundaries of these areas are currently being considered in the Cariboo-Chilcotin Land Use Plan implementation process.

- **Critical mule deer winter range**
  The Forest Service and the Ministry of Environment, Lands and Parks are jointly developing management plans for critical mule deer winter range areas in dry-belt Douglas-fir forests within the timber harvesting land base. Timber harvesting is currently restricted in these areas while plans are being prepared. For the timber supply analysis, 14,056 hectares were deducted from the timber harvesting land base for this habitat.

  Target management objectives for these areas are currently being considered in the Cariboo-Chilcotin Land Use Plan implementation process.

- **Maintaining older forests**
  Although there are currently no approved regional guidelines regarding the amount of older forests that must be maintained within each timber supply area, current management practices have been developed with consideration of the guidelines outlined in *An Old Growth Strategy for British Columbia*, May, 1992.

  For the purposes of this analysis, between 10 and 25 per cent of the timber harvesting land base in each zone was required to be older than 120 or 150 years at all times. Currently, about 28 per cent of the forests within the Quesnel Timber Supply Areas are older than 120 years, and in some cases these forests are reserved from harvesting to protect specific non-timber values. For example, a substantial amount of the older forests are located in critical wildlife habitat areas that were not included in the timber harvesting land base. It is not certain whether some of these forests will fulfill the requirements to maintain older forests, thus reducing the impact within the timber harvesting land base. It is also possible that a larger amount of older forests will be required to meet non-timber resource managment objectives.

  Figure 7 illustrates the impact of changing these requirements in the timber supply analysis.

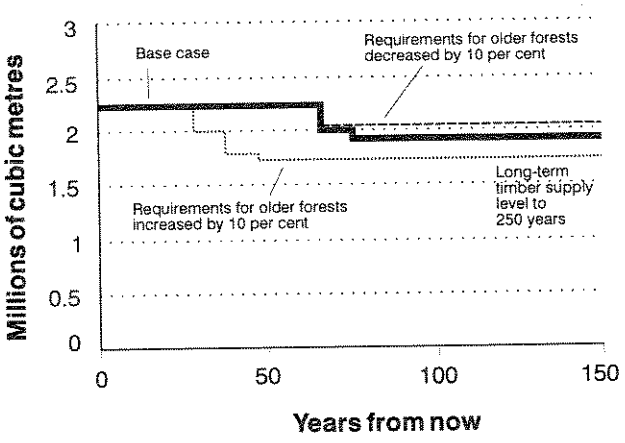


Figure 7 *Impacts of changing the requirements to maintain older forests*

Target management objectives for these areas are currently being considered in the Cariboo-Chilcotin Land Use Plan implementation process.

- **Local Resource Use Plans and visual quality zone**
  This zone contains areas where special management practices are being developed to meet management objectives for several non-timber resource values. As these practices have not been finalized, the draft practices were used in the timber supply analysis. It is possible that the practices approved for these areas will be more or less restrictive to timber harvesting than those included in the analysis.

- **Streams and lakeshore zones**
While management of streamside and lakeshore areas for water quality, recreational values, and fisheries and wildlife habitat is particularly important in the Quesnel Timber Supply Area, the amount of area in this zone and the appropriate practices for these areas are difficult to define.

For the timber supply analysis, this zone included 30 metres either side of all streams, and 30 metres around lakes that could be identified on forest cover maps. Further assessments may indicate that more or less area should be included in this zone.

The management practices defined as current management in the timber supply analysis for this zone restrict timber harvesting more than the practices in the integrated resource management zone. Since the data was completed for the timber supply analysis, practices adjacent to streams and lakes have been adjusted to be more consistent with the intentions of the Forest Practices Code. It is expected that in some areas within this zone, timber harvesting will not be permitted and these areas will be removed from the timber harvesting land base. This may reduce the timber supply.

C. Potential opportunities to partially offset possible reductions in timber supply

- **Improved timber recovery from harvested areas**
Currently, all lodgepole pine timber larger than approximately 15 centimetres in diameter at the stump must be removed from harvested areas. For other species the minimum diameter is about 20 centimetres. If all species were utilized to a 15 centimetre diameter, the available timber supply would increase, without increasing the area that is harvested. Some timber companies have already voluntarily implemented this practice.

Further study is needed to estimate the additional timber volume that could be realized through this practice, assess whether the resulting timber products would justify the increased harvesting cost, and evaluate the biological effects of removing this additional amount of organic material from these areas.

- **Harvesting practices for environmentally sensitive areas**
Approximately 21,733 hectares of environmentally sensitive areas were deducted from the timber harvesting land base because current harvesting methods are not suitable for harvesting in these areas (*TSAR* page 7). It is possible that alternative harvesting practices could be developed to harvest these forests without compromising the environmental values in these areas. This may lead to an increase in the timber harvesting land base and in the short- and long-term timber supply.

- **Defining older forests**
In the Special Sale Area zone, the Local Resource Use Plan and visual quality zone, the streams and lakeshore zone and the integrated resource management zone, 150 years was used to define older forests that must be maintained throughout the timber supply area to provide wildlife habitat and biodiversity. Because most of the forests in the Quesnel Timber Supply Area contain lodgepole pine which becomes susceptible to mountain pine beetle damage after approximately 120 years, there were concerns that using 150 years was not appropriate.

The impact of using 120 years to define older forests was tested in the timber supply analysis. Using this definition, the short-term timber supply was the same as the base case forecast, but the long-term supply was increased by about two per cent compared to the base case. (*TSAR* page 27)

- **Intensive silvicultural treatments**
In some circumstances, intensive silvicultural treatments (e.g., juvenile spacing, fertilization) that increase tree growth and the long-term timber supply can also increase the short-term timber supply.

The Timber Supply Review was designed to assess the timber supply impacts of current practices, thus the range of intensive silvicultural treatments that might be implemented in the Quesnel Timber Supply Area were not examined. Further analyses are required to examine the potential opportunites for intensive silvicultural treatments, and the implications.

- **Commercial thinning**
Although commercial thinning is not currently practiced in the Quesnel Timber Supply Area, approximately 23 per cent of the forests within the timber supply area are between 30 and 80 years and may be candidates for this treatment. This practice may provide additional timber volume in the short-term. Operational trials of commercial thinning and other similar options are currently being considered to evaluate this opportunity. It is also expected that the Forest Renewal Plan will encourage these types of initiatives.

Widespread commercial thinning may affect the long-term timber supply because the timber harvested in the short-term may reduce the amount of timber that is available to harvest from the same sites in the future. The quality and value of the remaining timber, however, should be improved through commercial thinning. Further

trials and assessments are required before this practice is widely implemented in the Quesnel Timber Supply Area.

Deciduous timber supply

Since 1990 there has been an allowable annual cut of 50,000 cubic metres per year for predominantly deciduous forests in the Quesnel Timber Supply Area, but, very little harvesting has occurred in these forests. As a result, this opportunity was not examined in the timber supply analysis. Recently however, interest has been expressed in harvesting deciduous forests.

Current inventory information indicates that, of the 73,000 hectares of predominantly deciduous forests in the Quesnel Timber Supply Area, approximately 57,000 hectares are available for timber harvesting. It is estimated these forests contain approximately 3.0 million cubic metres of mature timber volume.

Examining critical factors

- **Estimates of merchantable timber**
  Deciduous forests in the Quesnel Timber Supply Area are naturally very susceptible to diseases that cause extensive decay and reduce their suitability for timber harvesting. A preliminary analysis based on the current forest inventory and the management practices used to evaluate the sawlog timber supply indicates the timber supply is closely related to the maximum age that these forests are considered to be suitable for timber harvesting. Based on a minimum harvest age of 80 years and an average merchantable volume of 113 cubic metres per hectare, it is estimated that the following timber supply levels could be maintained over the long term:
  - no maximum age - approximately 45,200 cubic metres per year
  - maximum age 150 years - approximately 42,400 cubic metres per year
  - maximum age 120 years - approximately 24,300 cubic metres per year

- **Natural transition of deciduous forests to coniferous forests**
  The current inventory of the predominantly deciduous forests is 10 to 20 years old. Over time, the conifer trees in some of these forests are likely to exceed the growth of the deciduous trees. This would eventually result in a change in the classification of these forests from predominantly deciduous to a conifer forest which would be a candidate for sawlog harvesting.

- **Integrated resource management practices**
  Deciduous forests often occur in riparian areas that provide critical wildlife habitat. Management practices that are more restrictive to timber harvesting than the practices that were used in the sawlog analyses may be required in these areas. This may reduce the available timber supply.

  In addition, harvesting of deciduous forests may affect the availability of mature timber for sawlog harvesting, or conversely, harvesting of sawlog forests may limit by the availability of deciduous forests for harvesting. This may occur because of the requirement that cutover areas must be reforested and reach three metres in height before adjacent forests can be harvested.

- **Deciduous timber in predominantly conifer forests**
  The timber volume from deciduous trees growing in predominantly coniferous forests was not included in the analysis of the sawlog and problem forest type timber supply, or in the above estimates for the predominantly deciduous forests. Currently, when these forests are harvested, the deciduous trees are not utilized. Some recovery of these trees has occurred recently.

  It may be possible to harvest more of the deciduous timber within predominantly coniferous forests without compromising biodiversity or riparian management requirements. This would permit more timber volume to be recovered without requiring additional area to be harvested.

Environmental and socio-economic impacts

Environmental concerns

The timber supply forecasts propose harvesting levels that may affect fish, wildlife and biodiversity. The forecasted harvest levels will create younger forests on much of the accessible area. This will have negative consequences for some wildlife species that depend on older forests, as well as for biodiversity conservation. Depending on the location and rate of timber harvesting, fragmentation of wildlife habitats can also be high, making it difficult for some species to follow natural movement patterns. There may also be positive impacts for some species, such as moose, whose habitat includes younger forests. (*SEA* page 50)

If it is not properly managed increased road access may have negative impacts on wildlife and fisheries species through increased hunting and fishing pressure, and on sensitive habitats, such as riparian zones.

The impacts of both harvesting and access development would be reduced at lower harvest levels. (*SEA* page 52)

First Nations impacts

First Nation people are concerned about the effect of harvest levels on the cultural, medicinal and food values they derive from forests. A reduction in the harvest level is considered by some to be more consistent with these values. Any decision that would help preserve existing forest resources until treaty negotiations are completed is preferred by First Nations.

The economic opportunities associated with timber harvesting are recognized by First Nations people. Maintaining current harvest levels, along with greater access to timber harvesting rights, would be consistent with the economic development objectives of some First Nations. Reductions in timber supply may affect the opportunities for First Nations to secure timber harvesting rights because competition for these rights will increase. On the other hand, reduced timber harvesting could help protect employment options in other economic activities such as hunting, fishing, trapping, trail guiding and related tourist activities. (*SEA* page 49)

Any job losses associated with harvest reductions would be significant for First Nations. Employment opportunities for First Nations people in silviculture and environmental restoration are expected to be created through the Forest Renewal Plan.

Community impacts

The impact of timber supply adjustments on local communities is an important consideration in the timber supply review. The economy in the Quesnel area is heavily dependant on the timber industry, making potential employment reductions in this sector a serious concern for area residents. Local communities recognize the importance of the timber industry in their economy, and have expressed their concern about possible changes in timber supply resulting from this review and other government initiatives, such as the Forest Practices Code and the Land Use Plan.

Chief forester's determination

The chief forester must determine an allowable annual cut as part of a strategy to achieve the projected long-term sustainable timber supply level. The base case forecast provides one alternative, but the chief forester could select another harvest level and continue to define a partitioned cut based on his consideration of the factors required under Section 7 of the *Forest Act*.

Your input is needed

The allowable annual cut is an important determination requiring well-informed and thoughtful public input. We ask you to answer the questions on the response form at the back of this paper. We encourage you to add any additional comments you feel are relevant. If you prefer, additional comments or a detailed submission may be written on separate pages.

Feedback is welcomed on any aspect of this *Discussion Paper*, the *Timber Supply Analysis Report* and the *Socio-economic Analysis Report* and other topics related to the timber supply in the Quesnel Timber Supply Area. Forest Service staff would be pleased to discuss questions or concerns that would help you prepare your response.

Please mail the completed questions and your comments to the forest district manager at the address below. Your comments will be accepted until June 1, 1995.

You may identify yourself on your response if you wish. If you do, you are reminded that responses will be subject to the *Freedom of Information and Protection of Privacy Act* and may be made public. If the responses are requested, personal identifiers will be removed before the responses are released.

A summary of public comments will be available from the district manager when the chief forester's allowable annual cut determination is announced.

For more information contact:

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Quesnel Timber Supply Area
Timber Supply Review

Discussion Paper Response Form

The *Forest Act* requires the chief forester to consider the following factors to determine the allowable annual cut for timber supply areas and tree farm licence areas:

- the rate of timber production that can be sustained from the area
- the short- and long-term implications for the province of alternative rates of timber harvesting from the area
- the timber requirements of established and proposed timber processing facilities
- the economic and social objectives of the Crown, as expressed by the minister, for the area, the general region, and the province
- abnormal pest infestations in the timber on the area and major salvage programs that are planned

The technical reports that have been prepared for the Timber Supply Review of the Quesnel Timber Supply Area provide information on these factors. We welcome further input from the public to ensure the best available information is used in the allowable annual cut determination. Please provide your comments on this form, or in another format by June 1, 1995.

A. Economic and social objectives

Please use the space below to provide your comments regarding the economic and social objectives you believe should be considered in determining the allowable annual cut for the Quesnel Timber Supply Area.

B. Technical forestry factors and impacts of alternative rates of harvest

Please use the space below to provide any information which you believe may assist the chief forester in considering the technical factors to determine the allowable annual cut for the Quesnel Timber Supply Area. Further information on the critical factors outlined on pages 8 to 9 in this paper would be most helpful.

Which community sector listed below best describes your interests?

- ☐ local business
- ☐ outdoor tourism
- ☐ general public
- ☐ First Nation
- ☐ timber industry
- ☐ environmental conservation
- ☐ other (please define)_____
- ☐ government agency (please identify)

Name (optional) _____

Address (optional) _____

Mail your comments to:

Doug Flintoft
District Manager
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