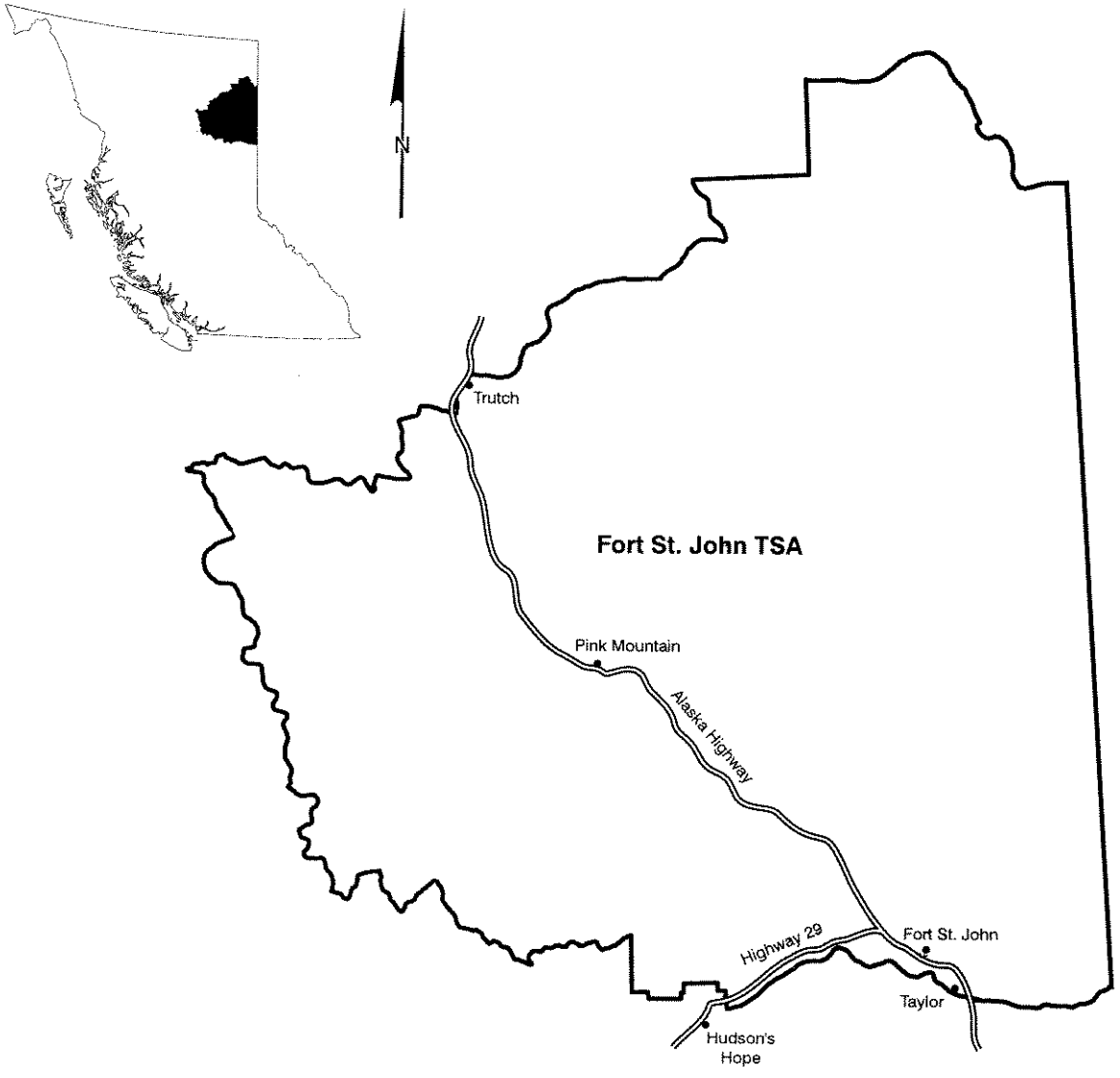
MINISTRY OF FORESTS

Fort St. John Timber Supply Area

Timber Supply Review Discussion Paper
March 1996



Province of British Columbia
Ministry of Forests

Fort St. John Timber Supply Area

Timber Supply Review Highlights

- 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 Fort St. John Timber Supply Area.

- The current allowable annual cut in the Fort St. John Timber Supply Area, set in 1990, includes 900,162 cubic metres per year for coniferous harvesting and 915,000 cubic metres per year for deciduous harvesting. To date no harvesting has occurred in predominantly deciduous forests. (page 5)

- Harvesting and processing the coniferous allowable annual cut in the Fort St. John Timber Supply Area is estimated to generate 1,485 person-years of total employment in the province, 46 per cent of which is created within the timber supply area. (page 6)

- The coniferous base case timber supply forecast indicates that, based on information available about forest management practices being implemented in 1994 when the analysis was initiated, the timber supply could support an increase in the allowable annual cut to 1.76 million cubic metres. (page 9)

- Several factors indicate the coniferous timber supply may be lower than projected in the base case forecast:
  - some of the small lodgepole pine forests that were included in the analysis may not be merchantable
  - a recent inventory audit suggests timber volumes may be lower than estimated and as a result fewer forests may be merchantable
  - limited vegetation management success may change the reforestation estimates (pages 9-10)

- Two factors may either increase or decrease the projected coniferous timber supply:
  - estimated requirements for older forests to meet integrated resource management objectives may over- or underestimate actual requirements
  - the size of the timber harvesting land base may be over- or underestimated (pages 10-11)

- Intensive silvicultural treatments and commercial thinning provide possible opportunities to further increase the projected coniferous timber supply. (page 11)

- The deciduous base case timber supply forecast indicates the current allowable annual cut can be maintained for 20 years before declining over 40 years to a long-term sustainable level of 635,000 cubic metres per year. (page 11)

- Recent studies indicate the timber volume estimates used in the deciduous base case forecast may underestimate the actual timber volumes. This suggests the timber supply may be greater than projected in the base case forecast. (page 12)

- Several factors may either increase or decrease the projected deciduous timber supply:
  - estimated requirements for older forests to meet integrated resource management objectives may over- or underestimate actual requirements
  - the forest cover requirements defined for the caribou habitat zones may not adequately reflect caribou habitat conditions
  - the size of the timber harvesting land base may be over- or underestimated (pages 12-13)

- The timber supply in the Fort St. John Timber Supply Area will be affected in the future through decisions from other government initiatives such as the Forest Practices Code* and the Protected Areas Strategy*, both of which are not accounted for in this timber supply analysis.

- 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 forecasts provide one alternative for coniferous and deciduous harvesting, 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 definition section on the following 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.

Current 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 7.

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

Forest Practices Code
A law which requires better forest practices, with heavy penalties for violators. Implementation of the Code began on June 15, 1995.

Green-up
The time required for regenerated forests to reach a desired condition (usually a specific height) after harvesting to meet integrated resource management objectives and allow harvesting to take place in adjacent areas.

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.

Person-year
For the forest sector, a person-year is defined as the equivalent of one person working full-time for nine to 12 months. For example, one person working full-time for five to six months accounts for 0.5 person-years.

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 area
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 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 that 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*.

Fort St. John 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 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 more 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 Timber Supply Review in the Fort St. John Timber Supply Area and encourages British Columbians to comment on the findings. Public comments will be accepted until June 11, 1996. 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 1991 study completed by the Forest Service, *A Review of the Timber Supply Analysis Process for British Columbia*, examined the procedures that 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 his 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
   - constraints on the amount of timber produced

Renewing our forests, securing our future

In British Columbia today, people are wrestling with one of the most complex and compelling issues of our time—the need to protect our environment and, at the same time, sustain our economy for present and future generations.

In addition to the Timber Supply Review, the government has a number of initiatives to create positive change for British Columbia:

- Forest Renewal BC is already creating hundreds of projects across the province to restore and protect the health of British Columbia's forests, create new forest jobs, and increase economic benefits from each tree harvested.
- The Forest Practices Code is ensuring new forestry standards and better management of the resource.
- The Protected Areas Strategy is doubling British Columbia's parks and protected wilderness—expanding parks and preserving pristine wilderness for our children's future.
- Through the work of dedicated British Columbians, the Commission on Resources and Environment and regional Land and Resource Management Plan teams, long-standing land-use debates are being resolved. The government has delivered land-use plans for Vancouver Island, the Cariboo-Chilcotin and the Kootenay-Boundary, and a Land and Resource Management Plan for the Kamloops area which mark important steps towards securing British Columbia's future.

from the area due to the 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 for 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 judgement 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 in 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 developed for the Timber Supply Review in timber supply areas. The diagram also indicates the status of the Timber Supply Review for the Fort St. John Timber Supply Area, and the estimated time required for 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 at least every five years after this review is completed to incorporate new information, new practices and government policies. Implementation of major government initiatives such as the Forest Practices Code, the Protected Areas Strategy and land-use recommendations resulting from Land and Resource Management Plans may have significant impacts on the timber supply in specific timber supply areas and tree farm licences. In these cases, the chief forester may decide to determine the allowable annual cuts more frequently than every five years.

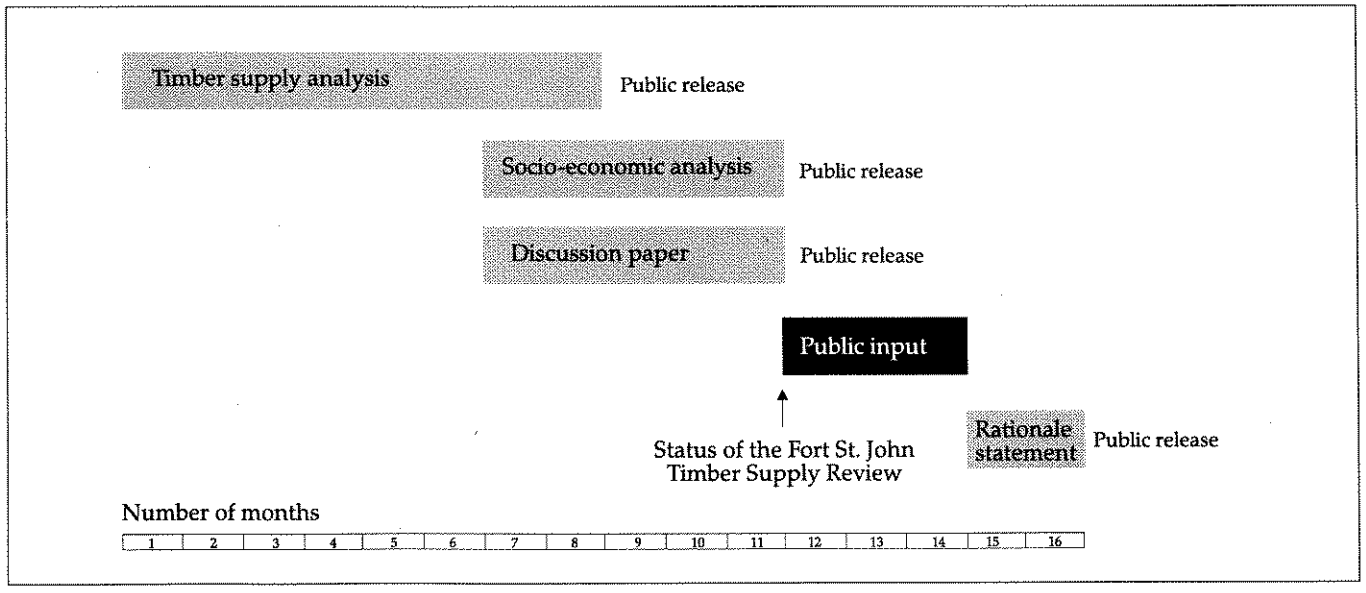


Figure 1 Steps in the Timber Supply Review process

Forest Practices Code

The *Forest Practices Code Act for British Columbia* became law on June 15, 1995. This law requires better forest practices throughout the province, and establishes heavy penalties for violators. As the Code is 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 Fort St. John Timber Supply Area to meet the requirements of the Code. Information about these practices will be provided to the chief forester for consideration in this allowable annual cut determination. It is expected that further implementation and experience with the Code will be required before all the timber supply effects of the Code can be properly assessed. Therefore, the timber supply impacts of some of the new practices will be incorporated in future allowable annual cut determinations.

Land and Resource Management Plans

The development of a Land and Resource Management Plan is currently underway in the Fort St. John Timber Supply Area. A working group, formed in 1993, consists of local citizens, licensees and government agencies and represents various resource interests and community perspectives. The working group will develop recommendations on new resource management objectives and strategies that balance social, economic and environmental values. Once these recommendations are approved by government, current forest management practices will be revised so they are consistent with these objectives.

Timber Supply Review in the Fort St. John Timber Supply Area

Forest Service staff in the Fort St. John Forest District finalized the data used for the *Fort St. John Timber Supply Analysis* in September 1994. This data was made available to stakeholders, interest groups and the general public for review and comment.

The Forest Service then conducted and released a short- and long-term timber supply analysis (*Fort St. John Timber Supply Analysis*, September 1995). A consultant also completed a socio-economic analysis of the timber supply forecasts (*Fort St. John Timber Supply Area: Socio-Economic Analysis*, March 1996). Both reports are available from the Fort St. John Forest District office, the Prince George Forest Region office and the Timber Supply Branch in Victoria.

This discussion paper summarizes the two analysis reports and includes an assessment of the timber supply implications of a recent inventory audit. Critical factors the chief forester must consider to determine the allowable annual cut for the Fort St. John Timber Supply Area are also highlighted. In conjunction with the release of this discussion paper and the *Socio-Economic Analysis*, 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 11, 1996, 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 Fort St. John Timber Supply Area during 1996. This determination and a *Rationale Statement* for the determination will be released 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 *Fort St. John Timber Supply Analysis Report; SEA* is the *Fort St. John Timber Supply Area: Socio-Economic Analysis*).

Description of the Fort St. John Timber Supply Area

The Fort St. John Timber Supply Area is located in the northeast interior of the province. The timber supply area stretches from the Peace River in the south to Ekwan Lake in the north. It extends from the Alberta border in the east to the continental divide along the Northern Rocky Mountains to the west. The timber supply area includes the communities of Fort St. John, Taylor and several smaller rural settlement areas.

The eastern portion of the Fort St. John Timber Supply Area is dominated by a plateau intersected by streams in deep gullies. Moving westward, the plateau gives way to a rolling, hilly landscape and finally to mountainous terrain in the west. In the northern part of the timber supply area, large river systems are dominant in some areas. The climate is severe throughout the timber supply area with long, cold winters and short growing seasons.

Fort St. John Timber Supply Area

Forest resources

The Fort St. John Timber Supply Area encompasses approximately 4.67 million hectares within the Fort St. John Forest District. The timber supply area does not include private lands, ecological reserves or provincial parks such as the Buckinghorse River Park.

Timber

Figure 2 illustrates that most of the land base in the timber supply area is not suitable or available for timber harvesting either because it is not forested or not feasible for forest harvesting, including areas that are too wet or steep, or areas with other site sensitivities or poor quality timber.

Based on current forest management practices, 24 per cent of the land base (1.2 million hectares) is suitable for commercial timber harvesting (*TSAR* page 6). Of this total, about 770,000 hectares are occupied by coniferous forests and about 424,000 hectares by deciduous forests. In addition 55,000 hectares that are currently not satisfactorily restocked will be available for harvesting in time. Together, these areas form the timber harvesting land base where harvesting can occur provided integrated resource management objectives are met.

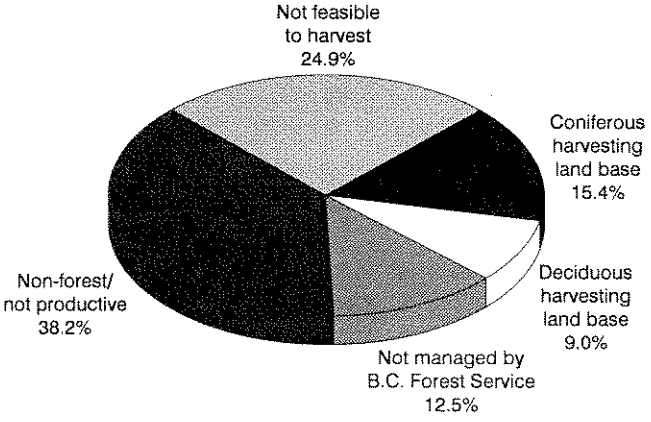


Figure 2. Classification of land within the Fort St. John Timber Supply Area

Notes: Study areas and areas of interest for the Protected Areas Strategy within the timber supply area have not been deducted from the timber harvesting land base for this analysis.

It should be noted that the size of the timber harvesting land base has changed compared to the last analysis because of natural ecological changes in the forests in the area, refinements in the timber inventory and changes in the types of forests that are merchantable. The coniferous harvesting land base has increased because of the inclusion of predominantly pine forests previously not considered harvestable. Conversely, the deciduous harvesting land base is smaller than in the previous analysis, primarily because of changes in the forest inventory and updated estimates of deciduous timber merchantability.

Figure 3 shows that the coniferous forests in the Fort St. John Timber Supply Area are dominated by spruce and lodgepole pine. Balsam is a minor component in mixed spruce and balsam forests in the mountainous southwestern portions of the timber supply area.

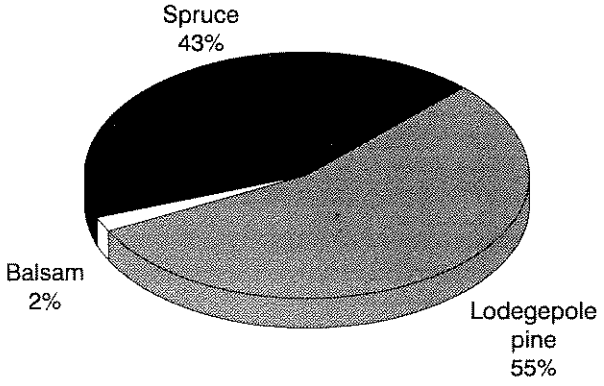


Figure 3. Area of dominant commercial coniferous tree species in the timber harvesting land base

The deciduous forests are dominated by aspen, while cottonwood makes up a minor component. These deciduous forests are located primarily in the southern and central portion of the timber supply area.

Some of the boreal forests within the Fort St. John Timber Supply Area will change over time from aspen to aspen/spruce to spruce forests. This natural ecological transition is not currently well understood and presents a challenge for timber supply analyses.

Currently, 39 per cent of the coniferous forests and 38 per cent of the deciduous forests are old enough to be considered harvestable (*TSAR* page 7). This can be attributed to limited timber harvesting activity in the past and the extensive fire history that has created a mosaic of age classes across the landscape within the timber supply area.

Wildlife and fisheries

The Fort St. John Timber Supply Area is home to a wide variety and abundance of land- and water-based wildlife, ranging from large mammals, including caribou and grizzly bears, to birds, fish and numerous invertebrate species. Many of the animal and plant species that inhabit the timber supply area are considered rare or endangered, or they are unique to this area of British Columbia. In many cases, these species require special consideration to ensure their survival. (SEA page 9)

Recreation and tourism

The Fort St. John Timber Supply Area offers a wide range of recreation opportunities. Hunting, camping, fishing and snowmobiling are popular in both roaded and unroaded areas. Large areas, particularly in the western portion of the timber supply area, are unroaded, permitting extensive backcountry recreation. The ongoing development of resource roads and seismic lines for oil and gas exploration increases access to some recreation opportunities but reduces backcountry recreation options. Forest Service recreation sites such as Inga Lake, Duhu Lake, Cypress Creek and Halfway River, offer good fishing, boating and camping opportunities. (SEA page 19)

Despite the abundance of tourism opportunities, most of the tourism activity in the timber supply area involves people driving through on their way to Alaska or to a guide-outfitting destination. The visual quality of the forest landscape is an important consideration along two major highway corridors that transect the Fort St. John Timber Supply Area: the Alaska Highway (route 97) and the Hudson's Hope Highway (route 29). Opportunities for growth in tourism exist. (*SEA* page 20)

Range

In the southern half of the timber supply area, recently harvested areas, older, sparsely stocked coniferous forests as well as deciduous forests provide forage for a beef cattle ranching industry. Prescribed range fires are used to enhance forage production on range areas. The ranching industry in the area is highly dependent on public rangeland. (*SEA* page 19)

Current allowable annual cut

The current allowable annual cut for the Fort St. John Timber Supply Area, determined in 1990, is approximately 1.8 million cubic metres per year, including allowable harvests from woodlots (*SEA* page 23). The current annual allowable cut is partitioned into two components:

- **Coniferous**
  The current allowable annual cut for coniferous is 900,162 cubic metres per year. Approximately 81 per cent of the coniferous cut is allocated to long-term replaceable licences, while 17 per cent is allocated to the Small Business Forest Enterprise Program administered by the Forest Service. Approximately two per cent is currently not allocated.

- **Deciduous**
  The current allowable annual cut for deciduous is 915,000 cubic metres per year. Approximately 55 per cent of this cut is allocated to pulpwood agreements*, while 20 per cent is available for harvest through the Small Business Forest Enterprise Program. The remaining 25 per cent of the deciduous cut is not allocated at this time.

  Pulpwood agreements permit timber harvesting in special circumstances when it is necessary to supplement other sources of wood supply. Unlike a forest licence or tree farm licence, a pulpwood agreement does not require the licensee to harvest a specific volume of timber within a five year period.

  To date, no deciduous harvesting has occurred in this timber supply area, other than a small amount harvested during coniferous harvesting.

Socio-economic profile

Population

According to the 1991 census, the population of the Fort St. John Timber Supply Area is estimated at 23,940. The population is widely dispersed, with 62 per cent (14,866) residing in the communities of Fort St. John and Taylor and the other 38 per cent live in various rural communities throughout the timber supply area. (*SEA* page 11)

First Nations

Aboriginal people comprise about three per cent of the total population of the timber supply area. Three First Nations have reserve lands and traditional territories within the timber supply area: Blueberry Band, Doig Band and Halfway Band. A fourth band, Prophet River, has reserve land outside of the timber supply area but their traditional territory falls within the timber supply area. These four bands represent 793 members and they are affiliated with the Treaty 8 Tribal Association. The bands' labour force is involved in ranching, trapping, big game guiding, oil and gas development, and silviculture and other forestry activities. (*SEA* page 15)

Local economy

The local economy depends heavily on three primary industries: petroleum, forestry and agriculture. In particular, the petroleum industry is of major importance during the current improvement in the natural gas market. This dependence on three different industries provides some cushioning during economic downturns in one of these sectors.

Figure 4 illustrates the level of total employment supported by each industry sector in the Fort St. John Timber Supply Area. (*SEA* page 17)

Fort St. John Timber Supply Area

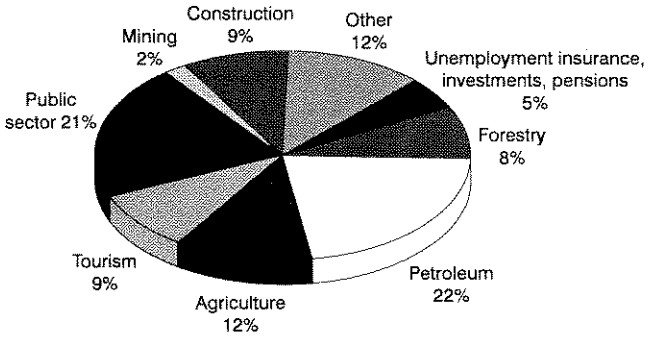


Figure 4. Employment generated by each sector

Timber industry

- **Coniferous**
  Compared with the rest of the province, large scale forest harvesting in the Fort St. John Timber Supply Area is relatively recent, with the first major operations in the late 1950s. Since that time, forestry has been a major contributor to the local economy. Currently, one company operates two sawmilling facilities within the Fort St. John Timber Supply Area. A second company operates a pulp mill in Taylor. The timber supply area has several smaller processing operations as well.

  Based on figures supplied by the licensees, approximately 83 per cent of the wood processed in 1994 was obtained from the Fort St. John Timber Supply Area. Other sources of wood include private land in British Columbia and Alberta. (*SEA* page 27)

  Harvesting, processing and silvicultural activities connected to the current allowable annual cut from the Fort St. John Timber Supply Area generate an estimated 434 person-years of direct forestry employment within the timber supply area. An additional 252 person-years of spin-off employment are estimated to be created through forest company and employee spending. (*SEA* page 29)

- **Deciduous**
  To date no harvesting has occurred in predominantly deciduous forests. The company operating the pulp mill in Taylor plans to more than double its production and to begin using aspen chips. This would, in time, require harvesting deciduous forests in the Fort St. John Timber Supply Area. As well, the Small Business Forest Enterprise Program has a deciduous allocation of 180,000 cubic metres available for harvest, as well as an allocation of 15,000 cubic metres to be harvested through the woodlot licence program.

Provincial economy and revenues

An estimated 160 person-years of direct employment are created outside the timber supply area by the harvesting of coniferous timber and silviculture activities and by the processing of timber supply area wood and chips in other timber supply areas.

Harvesting and processing the coniferous allowable annual cut of 900,000 cubic metres in the Fort St. John Timber Supply Area is estimated to generate 1,485 person-years of total employment in the province, 46 per cent of which is created within the timber supply area. (*SEA* page 29)

Approximately $21.99 million in provincial government revenues are generated annually by coniferous timber harvesting in the Fort St. John Timber Supply Area. This figure is based on the average total fees for harvesting public timber in the area plus estimated personal income taxes and other tax revenues. These estimates include the increased stumpage revenues being generated to fund Forest Renewal BC. (SEA page 38)

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 timber, range and recreation resources on public lands. The Ministry of Environment, Lands and Parks is responsible for the management of wildlife, water and parks, and shares responsibility for fisheries management with the federal Department of Fisheries and Oceans. These 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 existing land-use designations and current management practices—practices being approved and implemented in the Fort St. John Timber Supply Area in 1994 when the analysis was initiated. These practices are briefly described below. Readers are encouraged to review the *Fort St. John Timber Supply Analysis Report* (pages 9-13 and Appendix A) for more detailed information.

Management zones and integrated resource management practices

For the timber supply analysis, Forest Service staff divided the timber harvesting land base into management zones by grouping areas where similar integrated resource management practices are implemented. This approach permits analysis of the different types of forests and the range of practices in the Fort St. John Timber Supply Area. The area in each management zone was estimated from existing plans and the guidelines for integrated resource management in the timber supply area. The site-specific practices implemented in any one area may differ from the generalized practices used in the analysis.

Figure 5 illustrates the area within each management zone.

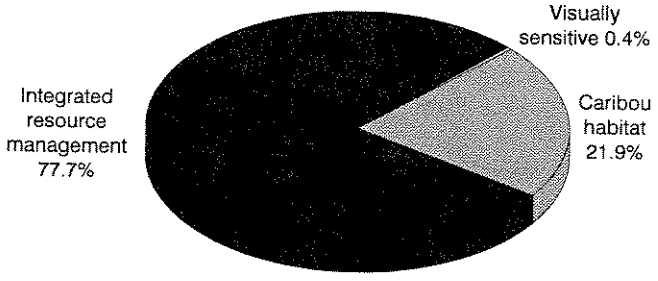


Figure 5. Area in each management zone

The information used in the analysis to account for the integrated resource management practices in each zone is described below.

- **Caribou habitat zones** - several areas were designated as particularly important caribou habitat, with specific management practices:
  - **Graham** (38,681 hectares) - includes important caribou and fur-bearer habitat. Portions of this zone include older spruce/subalpine fir forests. In this zone, at least 40 per cent of the timber harvesting land base must have forests at least 140 years old at all times.
  - **Hackney Hills** (44,303 hectares) - includes important caribou and fur-bearer habitat. The majority of this zone is boreal spruce forests. In this zone, at least 40 per cent of the timber harvesting land base must have forests at least 100 years old at all times.
  - **Kobes Creek** (20,301 hectares) - includes important caribou and fur-bearer habitat. The majority of this zone is boreal spruce forests. In this zone, at least 40 per cent of the timber harvesting land base must have forests at least 120 years old at all times.
  - **Milligan Hills** (139,338 hectares) - caribou in this area roam between the Fort St. John Timber Supply Area and Alberta where they are believed to be sensitive to road construction and traffic. To reduce the amount of access required, a two-pass harvesting pattern with 40 years between passes was used in the analysis.
- **Visually sensitive zone** (4,063 hectares) - includes an area 500 metres either side of the Alaska Highway where visual quality is particularly important. In this zone a maximum of 10 per cent of the land base is permitted to have forests less than five metres tall at any time. Throughout the remainder of the land base, visual quality is an important consideration, particularly in viewscapes surrounding rivers, recreational lakes and along several other road and highway corridors. In all visually sensitive areas, road construction and logging are planned and implemented to minimize visual impacts.
- **Integrated resource management zone** (892,747 hectares) - includes the remaining timber harvesting land base. In this zone, to maintain biological diversity and meet other forest management objectives, timber harvesting is not permitted to become overly concentrated in one area at any time. Timber adjacent to previously harvested areas cannot be harvested until the regenerated forest on the adjacent area is at least three metres tall. Also, at any one time, no more than 33 per cent of the timber harvesting land base in a specific area can be harvested and regenerated with forests less than three metres tall. Forests 100 years old or greater must occupy at least 10 per cent of the land base at all times.

Current practices

The forest management practices that were approved and implemented throughout the timber harvesting land base when the timber supply analysis was initiated are briefly described below.

- **Basic silviculture** - British Columbia laws require areas that are harvested and expected to produce timber in the future to be reforested with ecologically acceptable species within a specified time frame. The typical silvicultural practice is to: clearcut harvest; site prepare, if necessary; reforest by planting with a mix of species or by relying on natural regeneration; and control competing vegetation if needed. It is assumed that the majority of the harvested areas will be restocked within three to four years after harvesting. In some circumstances, such as high elevation sites, restocking may take five to seven years.

- **Timber utilization** - Within cutblocks, coniferous timber that meets or exceeds the following size limits and is suitable for the manufacture of lumber or pulp chips, must be utilized:
  - diameter at chest height:
    - lodgepole pine: 12.5 centimetres
    - other coniferous species: 17.5 centimetres
  - diameter at top: all species: 10 centimetres

  As no deciduous harvesting had occurred in the Fort St. John Timber Supply Area when the data was prepared for the timber supply analysis, standards from the Dawson Creek Timber Supply Area, where deciduous harvesting is occurring, were used. These standards are 12.5 centimetres at chest height and 10 centimetres top diameter. It should be noted that the current pulpwood agreement for deciduous harvesting includes a utilization standard of 17.5 centimetres at chest height.

- **Roads and landings** - Road building and harvesting layout follow provincial and regional guidelines. For the timber supply analysis, five per cent of the timber harvesting land base was deducted for roads and landings, and approximately 1.5 per cent was deducted for losses to oil and gas exploration.

- **Forest health and unsalvaged losses** - Forest losses due to wildlife, insects, diseases and blowdown are minimized as much as possible and damaged timber is harvested when feasible. Unsalvaged losses of merchantable coniferous timber are estimated to be 150,000 cubic metres per year, due to:
  - fire - 137,000 cubic metres per year
  - wind damage - 13,000 cubic metres per year

  Estimates of unsalvaged losses for deciduous species are not currently available to incorporate in this review.

- **Harvestable ages** - Minimum harvestable age is defined as the time it takes for forests to grow to harvestable size which varies by tree species and site productivity. The minimum harvestable ages used in the timber supply analysis range from 60 to 140 years.

- **Fish and wildlife/ biodiversity** - Riparian buffer areas, where timber harvesting is restricted, are located along waterways to protect fish habitat and provide wildlife habitat. For the timber supply analysis, the timber harvesting land base was reduced by 1.5 per cent to account for these buffers. This area is in addition to the forested areas deducted from the timber harvesting land base, such as environmentally sensitive areas and forests that are uneconomical to harvest which also provide wildlife habitat and fulfill biodiversity management objectives.

  In addition, the following practices contribute to general biodiversity and wildlife habitat: the forest cover requirements defined for each management zone; requiring regenerated forests on previously harvested areas to be at least three metres tall before the adjacent timber can be harvested; and, leaving deciduous trees in mainly coniferous forests standing after harvesting.

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 forecasts and the critical factors described below are part of the information the chief forester will use to determine the allowable annual cut for the next five years.

To complete the timber supply analysis for the Fort St. John Timber Supply Area, a computer model was used to produce base case* timber supply forecasts for the coniferous and deciduous components of the timber harvesting land base. These forecasts were required to meet each of the following conditions:

- maintain the current allowable annual cut as long as possible without compromising future timber supply
- if the current allowable annual cut could be achieved for the forecast period of 250 years, timber supply levels were increased until shortfalls resulted in some decades

In addition to the base case forecasts, tests were completed during the timber supply analysis to identify which factors had the greatest effect on the timber supply forecasts. Also, since September 1994 when the data was finalized for the timber supply analysis, Forest Service staff have continued to collect information for some of the factors in the analysis, resulting in possible improvements. These critical factors are discussed in this section for both the coniferous and deciduous components. Other factors were tested and are discussed in the *Fort St. John Timber Supply Analysis Report* (pages 29-43) but were not considered critical to this review and therefore are not included in this discussion paper.

The chief forester must carefully evaluate this information to determine the allowable annual cut and identify where improved information is needed for the next timber supply review. We encourage you to do the same.

Coniferous timber supply

Base case forecast

The coniferous base case forecast, produced using the best information available about forest practices when the analysis was initiated in 1994 and which meets the conditions described above, indicates there is a substantial timber supply available above the current allowable annual cut (Figure 6). The base case forecast indicates an initial timber supply level of 1.76 million cubic metres per year, which is 95 per cent above the current allowable annual cut. This level can be maintained for approximately 150 years before increasing to a long-term level of 1.84 million cubic metres. (*TSAR* pages 15-16)

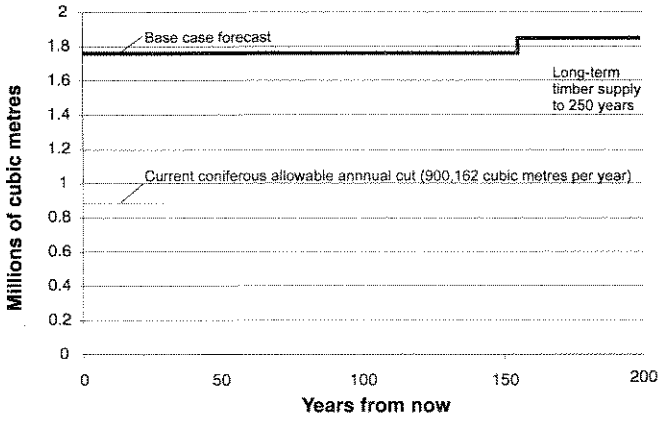


Figure 6. Coniferous base case timber supply forecast

This projected significant increase in the timber supply is due mainly to the following factors:

- **reclassification of forest types**
  Reinventory of some forest types not previously included in the timber harvesting land base, particularly small pine and not satisfactorily restocked areas, has indicated these areas are suitable for timber harvesting and therefore have been included in this land base. The addition of these areas has substantially increased the size of the timber harvesting land base.

- **increased estimates of timber volumes from regenerated forests**
  Revised forest growth estimates indicate more timber can be expected to be harvested from regenerated forests than predicted for past analyses.

Examining critical factors

Factors indicating the timber supply may be lower than predicted in the base case

- **Lodgepole pine merchantability**
  For the base case forecast, the minimum merchantable height was set at 17.5 metres. Lodgepole pine forests that were predicted to reach this minimum height in 100 years, and forests of other species predicted to reach this height in 120 years, were included in the timber harvesting land base. This age difference was used because lodgepole pine is a faster-growing, shorter living species.

The base case forecast is dependent on increased harvesting in predominantly lodgepole pine forests with smaller, shorter trees than has occurred in the past. In fact, to date, harvesting has been limited in these forests. The ability of existing timber processing facilities to profitably increase the proportion of these forests in their wood supply is unknown.

The timber supply effects of changing the minimum height criteria from 17.5 to 20 metres are shown in Figure 7. The resulting timber supply reduction is primarily due to the removal of approximately 175,000 hectares of marginally merchantable forests from the timber harvesting land base. (*TSAR* page 31)

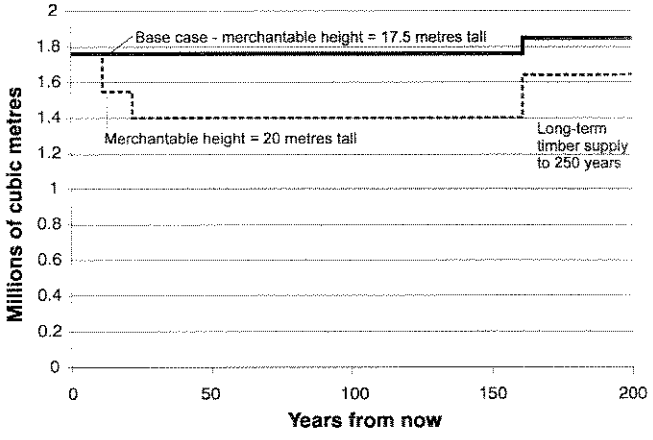


Figure 7. Timber supply impacts if the minimum merchantable height is increased to 20 metres

- **Inventory audit results**
  Since the data for the timber supply analysis was prepared, an audit of the inventory estimates of merchantable timber in existing forests was completed. The principle objective of this audit was to identify timber supply areas or tree farm licences where further timber inventory work is required. While these audit results are not

appropriate to use directly in timber supply analyses, they can provide a general indication of the overall accuracy of the inventory.

The results of this audit indicate that for the timber supply area as a whole, the tree heights predicted by the current inventory may be overestimated by approximately 2.5 metres, and timber volumes, on average, may be overestimated by about 21 per cent. As described above, because minimum height at a specified age was used to define merchantability, the timber harvesting land base would be smaller than defined for the base case if actual heights have been overestimated. Also, lower estimates of merchantable timber volume would result in reduced timber supply forecasts. As Figure 8 illustrates, this audit suggests there may not be as much flexibility in the timber supply as indicated in the base case forecast. Further studies are required to refine the results of the inventory audit.

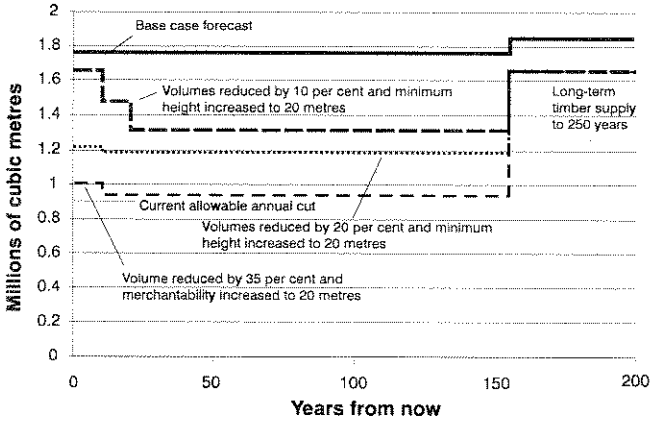


Figure 8. Effects of incorporating the inventory audit results

- **Vegetation management success**
  A substantial portion of the timber harvesting land base in the Fort St. John Timber Supply Area requires silvicultural treatments to manage competing vegetation. In some areas, chemical herbicides are used. Given public concerns surrounding the use of chemical herbicides, their use may become limited in the near future. This could reduce regeneration success on these sites.

  Figure 9 shows the timber supply impacts of limited vegetation management success on the better growing sites in the timber supply area (approximately 15 per cent of the land base). Limited vegetation management success leads to changes in timber species composition and longer regeneration delays which influences the projected timber supply. Forest Service staff are of the opinion that regeneration success may be reduced on a wider range of sites than were included in this analysis, which would have an even greater impact on the projected timber supply. (*TSAR* page 39)

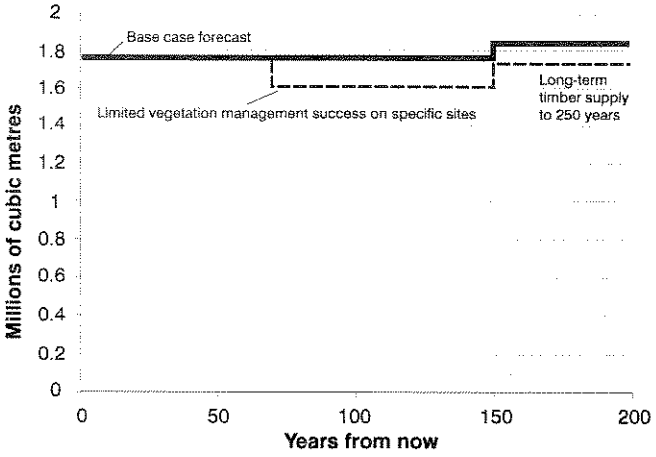


Figure 9. Timber supply impacts of limited vegetation management success on specific sites

Factors that may either increase or decrease the timber supply

- **Older forest cover requirements**
  In the base case analysis, older forests (100 years or older) must occupy at least 10 per cent of the timber harvesting land base at all times in the integrated resource management zone. This estimate may or may not be adequate to provide for wildlife habitat and movement corridors and for general biodiversity. Figure 10 shows the timber supply impacts of changes in this estimate. (*TSAR* page 37)

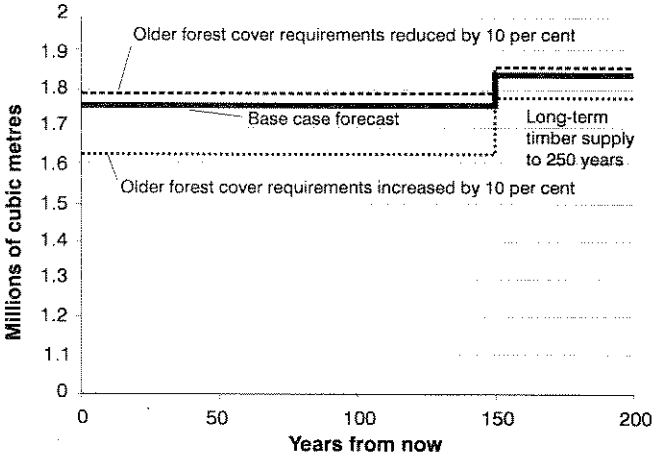


Figure 10. Timber supply impacts of changes in the older forest cover requirements

- **Size of the coniferous timber harvesting land base**
  Defining the timber harvesting land base for this analysis involved several estimates and projections about the forested land that is available and feasible for harvesting. Forest inventory classifications and forest development plans were used to approximate which forests are merchantable and feasible to access and harvest with existing technology.

Several factors may result in an increase or decrease in the size of the timber harvesting land base compared to the estimates used in the base case forecast:

- **timber inventory data**
  As discussed, the recent audit of the timber inventory suggests the data used in the base case forecast may have overestimated the size of the timber harvesting land base.

- **area that is feasible to access and harvest**
  Detailed assessment of the area that is feasible to access and harvest with existing technology had not been completed for approximately seven per cent of the timber supply area when the data was compiled for the timber supply analysis. However, a review of sample map sheets indicates areas that are not feasible to harvest were generally removed from the timber harvesting land base through other deductions because they are classified as non-productive area or the existing timber is unmerchantable.

- **riparian habitat area**
  In the timber supply analysis, 17,352 hectares of riparian habitat areas were excluded from the timber harvesting land base. This represents approximately 1.5 per cent of the timber harvesting land base. Ministry of Environment, Lands and Parks staff are concerned this estimate may be low, based on indications from other areas where studies have shown that riparian areas occupy more of the timber harvesting land base. A higher estimate of riparian area would reduce the size of the timber harvesting land base which may result in a reduction in the timber supply.

Tests completed during the timber supply analysis indicate a 15 per cent increase or decrease in the size of the timber harvesting land base results in a corresponding increase or decrease of approximately 300,000 cubic metres of timber supply annually. (*TSAR* page 32)

Possible opportunities to further increase the timber supply

- **Intensive silvicultural treatments**
  In some situations, intensive silvicultural treatments that increase tree growth (such as juvenile spacing and fertilization) also increase the short- and long-term timber supply. However, the Timber Supply Review was designed to assess the timber supply impacts of current practices, which do not include intensive silvicultural treatments. As a result, the range of intensive silvicultural treatments that might be implemented in the Fort St. John Timber Supply Area was not examined. Further analyses are required to examine the potential opportunities for intensive silvicultural treatments and the implications of these treatments on timber supply and other resources.

- **Commercial thinning**
  Approximately 27 per cent of the timber harvesting land base in the Fort St. John Timber Supply Area has forests between 40 and 80 years old that might be candidates for commercial thinning. However, to date no commercial thinning has occurred in the area. Some opportunities may exist to thin dense lodgepole pine forests.

Deciduous timber supply

Base case forecast

The deciduous base case forecast for the Fort St. John Timber Supply Area is based on forest practices being implemented in 1994 when the analysis was initiated and meets the requirements outlined earlier for the analysis. It indicates the current allowable annual cut of 915,000 cubic metres per year can be maintained for 20 years (Figure 11) before declining by 10 per cent per decade over 30 years to the long-term sustainable level of 635,000 cubic metres per year. (*TSAR* page 22)

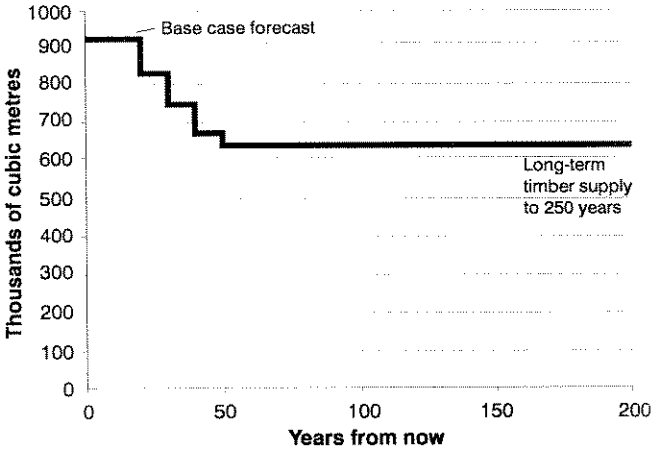


Figure 11. Deciduous base case timber supply forecast

Two factors interacted to create this forecast:

- **reduced timber volume estimates for existing forests**
  A significant reduction in estimated timber yields from existing deciduous forests is the most important factor resulting in the forecasted reduction in the deciduous timber supply. Current estimates are approximately 20 per cent below estimates used in past analyses. This reduction primarily results from the use of updated inventory information to estimate forest growth.

- **reduced timber harvesting land base**
  The area of deciduous forest estimated to be available and suitable for harvesting has been reduced from the previous estimates used in the 1990 deciduous timber supply analysis. This area reduction is partly the result of applying estimates of timber merchantability based on actual harvesting in similar forests in the Dawson Creek Timber Supply Area.

Factors indicating the timber supply may be higher than predicted in the base case

- **Estimated timber volumes in existing forests**
  To examine the accuracy of the deciduous timber volumes used in the base case forecast, 280 sample growth plots were used from deciduous forest types in the Fort St. John Timber Supply Area. Results from these sample growth plots indicate, on average, deciduous timber volumes may be underestimated by 13 to 19 per cent in the base case forecast. In addition to potential timber volume increases, these results also suggest the timber harvesting land base may be larger than estimated in the base case because fewer areas would have been deducted due to low timber productivity or volume if the revised information had been used.

Deciduous timber volumes were also sampled in the recent forest inventory audit in the Fort St. John Timber Supply Area. The audit also suggests deciduous volumes may be underestimated in the inventory, however, the sample size is too small to draw a statistically reliable conclusion.

There is no evidence that indicates deciduous volumes used in the base case forecast might be overestimated.

Figure 12 illustrates the effects of increased deciduous timber volume estimates. (*TSAR* page 42)

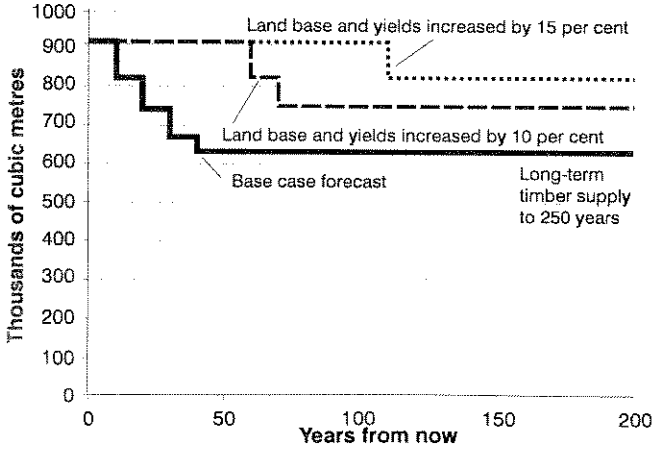


Figure 12. Effects of increased deciduous timber volume estimates

Factors that may either increase or decrease the timber supply

- **Older forest cover requirements**
  In the base case analysis, older forests (100 years or older) must occupy at least 10 per cent of the timber harvesting land base at all times in the integrated resource management and visually sensitive zones. This estimate may or may not be adequate to provide for wildlife habitat and movement corridors and for general biodiversity, particularly given the lack of knowledge regarding how older deciduous forests in this area change over time. Figure 13 shows the timber supply impacts of changes in this estimate. (*TSAR* page 45)

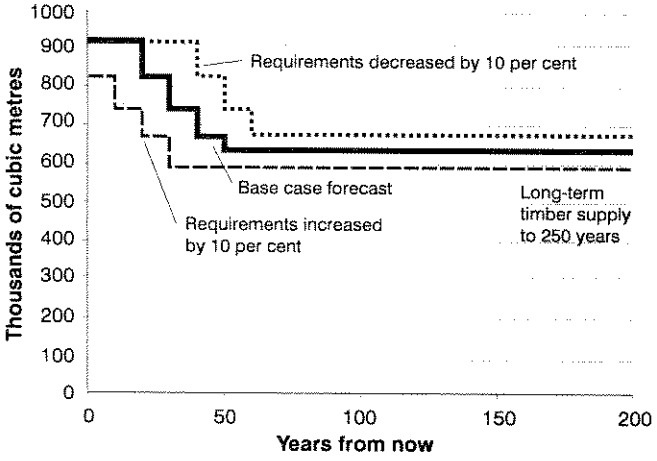


Figure 13. Effects of changes in the older forest cover requirements

- **Forest cover requirements in the caribou habitat zones**
  In the deciduous base case analysis, caribou habitat management was estimated by requiring that at least 40 per cent of the timber harvesting land base in the caribou habitat zones be occupied by forests at least 100 to 140 years old. These forest cover requirements may or may not adequately reflect caribou habitat requirements.

Figure 14 illustrates the effects of increasing the forest cover requirements in the caribou management zones. Decreasing the requirements by 10 per cent has no effect on the base case forecast. (*TSAR* page 46)

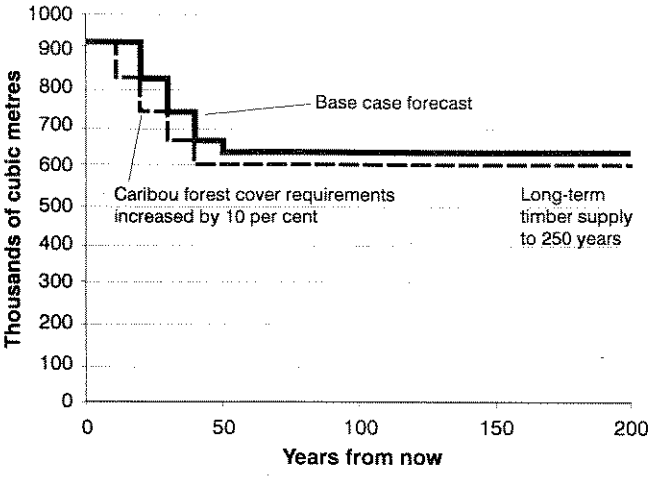


Figure 14. Effects of increasing the forest cover requirements in the caribou management zones

- **Size of the deciduous timber harvesting land base**
  There has been limited harvesting and use of deciduous timber in the Fort St. John Timber supply Area, making it difficult to estimate the forest types and site conditions that are feasible and economical to harvest. For this analysis, criteria for defining the deciduous timber harvesting land base were adapted from the Dawson Creek Timber Supply Area where deciduous harvesting is ongoing. This may or may not adequately represent the deciduous forest areas suitable for harvesting in the Fort St. John Timber Supply Area.

  In addition, as outlined for the coniferous timber harvesting land base, it is possible that the riparian area has been underestimated, which may result in a reduction in the size of the deciduous timber harvesting land base and possibly in the projected timber supply.

  Figure 15 shows the effects of changes in the size of the deciduous timber harvesting land base. (*TSAR* page 48)

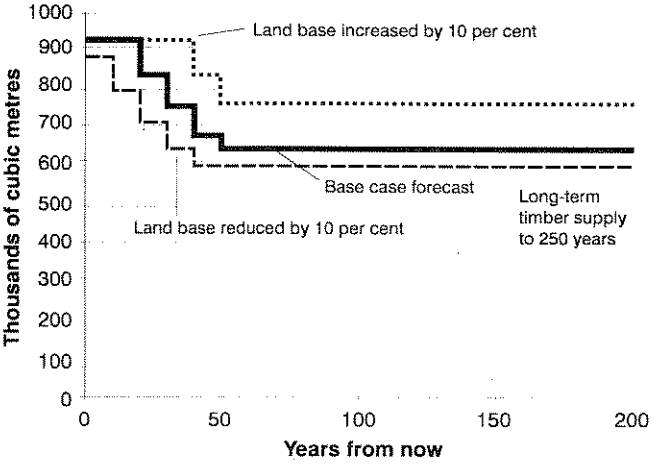


Figure 15. Effects of changes in the size of the deciduous timber harvesting land base

Environmental and socio-economic implications

Environmental concerns

The base case timber supply forecast proposes harvesting levels that may affect the integrity of natural ecosystems over the long term. The forecasted levels will create younger forests on much of the area and this will have negative consequences for wildlife species that depend on older forests. Dispersed harvesting will increase older forest habitat fragmentation.

Ministry of Environment, Lands and Parks staff are concerned that current management strategies do not address all the issues that threaten fish and wildlife populations. Specific concerns include but are not limited to:

- **biological diversity and the sustainability of ecosystems**
  Areas already identified as inoperable, non-merchantable or environmentally sensitive will help protect biodiversity in the short term, but additional measures are likely needed to reduce the fragmentation and degradation of wildlife habitat and ensure long-term sustainability of natural ecosystems. Options include alternatives to clearcutting, managing road access, limiting conversion of natural forests to plantations, limiting disturbance of riparian corridor ecosystems, and increasing the amount of residual coarse, woody debris and number of standing dead trees left after harvesting.
- **protection of older-aged forest habitats**
  Many important and vulnerable wildlife species, including caribou and pine marten, depend on older forest habitats. Although some of this habitat will be maintained through inoperable and non-merchantable forested areas, sustainability requires careful, long-term planning with extended rotations in selected areas and managed forest ecosystem networks. Large, connected forests provide critical habitat for these and other forest dwelling species that are at risk.
- **road building and increased human access**
  Expanding the road network within the timber supply area is likely to threaten many wildlife species, such as grizzly bear, caribou, wolf and bull trout, through increased hunting and fishing. (*SEA* page 49)
- **hardwood habitats**
  The long-term health and survival of some wildlife species are dependent on hardwood forests. It is important that hardwood forests, once harvested, be allowed to regenerate. This will ensure the continued presence of these types of habitats, and the wildlife species that depend on them. (*SEA* page 50)

Fort St. John Timber Supply Area

First Nations implications

As an increase in the coniferous timber supply is projected, there will be increased opportunity for employment of First Nations people within the Fort St. John Timber Supply Area. First Nations are concerned with their ability to access a share of the allowable annual cut in the near future to assist with economic development. An increase in the rate of harvest has the potential to negatively impact areas of traditional First Nation use if not adequately planned.

Community implications

The impact of timber supply adjustments on local communities and the provincial economy is an important consideration in the Timber Supply Review. Communities within the Fort St. John Timber Supply Area recognize the importance of the timber industry in their economy, and have expressed concern about possible changes in timber supply resulting from this review and other government initiatives, such as the Forest Practices Code and the Protected Areas Strategy.

An increase in the allowable annual cut will create new employment opportunities within the timber supply area. If substantial enough, the increase could draw significant numbers of people to the area and improve the local tax base. This development could also enhance the forest sector's capability to act as a buffer to the volatile oil and gas industry. Conversely, a substantial increase in timber supply would put pressure on community infrastructure, including the local housing market. In addition, some economic sectors, such as guide-outfitting which is dependent on undisturbed settings, could be negatively impacted by higher harvesting levels.

The impacts of increased timber harvesting on tourism are uncertain. However, it is likely that the demand for recreation opportunities in the timber supply area will continue to increase.

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 may select another harvest level based on his consideration of the factors required under Section 7 of the *Forest Act*, which are listed on page 1 and 2 of this paper.

Your input is needed

The allowable annual cut determination is an important decision 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 that you feel are relevant. If you prefer, additional comments or a detailed submission can 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*, and other topics related to the timber supply in the Fort St. John Timber Supply Area. Forest Service district staff would be pleased to discuss questions or concerns that would help prepare your response.

Please mail the completed questions and your comments to the forest district manager at the address below. Your comment will be accepted until June 11, 1996.

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 made available from the district manager when the chief forester's allowable annual cut determination is announced.

For more information contact:

J.D. Lawson
District Manager
Fort St. John Forest District
8808-72 Street
Fort St. John, BC
V1J 6M2

Phone: (604) 787-5600

Fort St. John 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 Fort St. John 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 11, 1996.

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 Fort St. John 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 Fort St. John Timber Supply Area. Further information on the critical factors outlined on pages 9-13 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:

J.D. Lawson
District Manager
Fort St. John Forest District
8808-72 Street
Fort St. John, BC
V1J 6M2

Phone: (604) 787-5600