

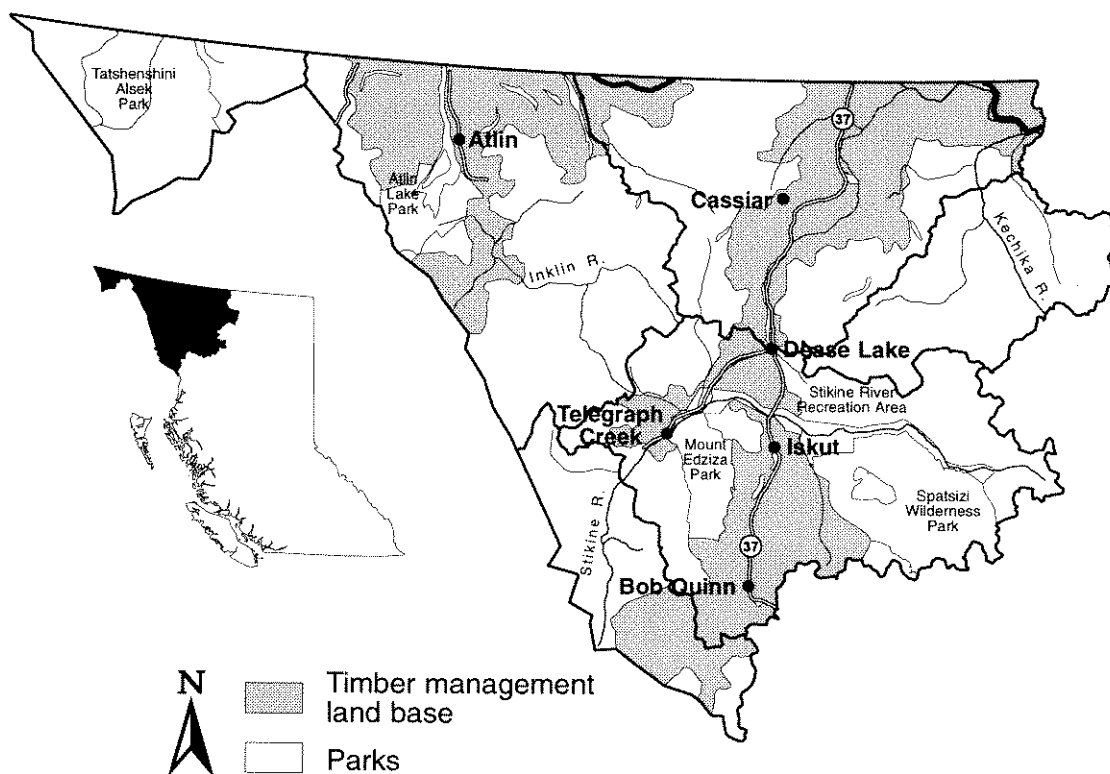


MINISTRY OF FORESTS

Cassiar Timber Supply Area

TIMBER SUPPLY SECTION
RESOURCE PLANNING BRANCH

Timber Supply Review Discussion Paper
November 1994



Province of
British Columbia
Ministry
of Forests

Cassiar Timber Supply Area

Timber Supply Review Highlights

- The British Columbia Forest Service is reviewing the timber supply for all timber supply areas* and tree farm licence* areas in the province. The review examines the impacts of current integrated resource management* practices on the timber supply*, economy and environment of the local area and the province. Based on the results of this review, the chief forester may decide to adjust the allowable annual cut* for the Cassiar Timber Supply Area.
- The Cassiar Timber Supply Area is the largest in British Columbia, covering one-sixth of the province. Only three per cent of the timber supply area is considered economically and environmentally feasible to harvest. The forest industry is small and has operated sporadically. (page 3)
- The current allowable annual cut, set in 1984, is 140,000 cubic metres per year. The average cut for the past three years, however, has been 87,000 cubic metres per year. Almost all of this has been harvested by non-resident contractors and processed at mills outside the timber supply area. It is estimated that the harvest of 87,000 cubic metres per year supports 12 person-years* of employment and contributes \$340,000 in employment income within the timber supply area. (page 4)
- On the provincial level, the current harvest is estimated to support an additional 155 person-years of employment and contribute \$4 million in employment income. The harvest also contributes \$2.4 million to the provincial government in stumpage and personal income and corporate taxes. (page 5)
- The timber supply analysis forecasts that the present allowable annual cut can be maintained and even increased without causing timber supply shortfalls in the future. The base case forecast* indicates a supply of 842,400 cubic metres per year can be sustained, approximately six times greater than the present allowable annual cut. This timber supply level can be maintained for 70 years before it increases to reach the long-term sustainable level of 867,000 cubic metres per year. (page 6)
- The best available information was used in the timber supply analysis. However, using updated or more complete information for the following factors might influence the timber supply estimates:
 - forest inventory dates from the 1970s and does not contain the detail required for reliable forecasting (page 8)
 - historical data is not available to substantiate the forest growth estimates (page 8)
 - only ground-based harvesting techniques are currently used and an estimated 10 to 30 per cent of the timber management land base* is not suitable for these methods (page 8)
 - inventory data for non-timber resources is not available and land base reductions to account for these resources may not be adequate (page 8)
- Several alternatives exist for the chief forester to adjust the short-term allowable annual cut as part of a strategy to achieve the long-term timber supply (page 9):
 - the allowable annual cut could be maintained at the present level
 - small increases could be implemented now, with larger increases in the future
 - a consistent level of increase could occur over the next 50 years
 - a very large increase could be made now, with no future increases
- The timber supply in the Cassiar Timber Supply Area could be affected in the future through decisions from other government initiatives such as the Forest Practices Code*, the Protected Areas Strategy* and First Nations land claims, none of which are accounted for in the timber supply analysis.
- The allowable annual cut will be re-assessed within five years to reflect decisions from other processes and changes in economic conditions, available information and analytical techniques.

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

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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

A timber supply forecast that illustrates the effects of current forest management practices on the timber supply using the best information that was available when the data package was prepared.

Current management practices

Forest practices that were being approved and implemented in the timber supply area when this review was initiated. These practices are described in this paper starting on page 5.

Commission on Resources and Environment (C.O.R.E.)

An independent commission established to develop and test land-use planning processes in consultation with stakeholders.

Forest Practices Code

A law which requires better forest practices, with heavy penalties for violators. The final code is currently planned for implementation in late 1994.

Integrated resource management

The identification and consideration of all resource values, including social, economic and environmental needs, in land use and development 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 area (usually a timber supply area).

Person-year

One person working the equivalent of one full year. If someone works full time for six months, he or she accounts for 0.50 person-years.

Protected Areas Strategy

A provincial government initiative to protect representative areas within each ecological region of the province. This may result in some areas in the Cassiar Timber Supply Area being protected from timber harvesting.

Riparian area

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

Timber management land base

Crown forest land which is economical and environmentally feasible to access and harvest.

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 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 described area of Crown land.

Cassiar 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:

- identifying the economic, environmental and social consequences of existing forest management practices including their impacts on the short- and long-term timber supply
- identifying where improved information is required to make reliable forecasts
- providing 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 from the Timber Supply Review in the Cassiar Timber Supply Area and encourages British Columbians to comment on the findings. Public comments will be accepted until February 15, 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 1991 study completed 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 take into account integrated resource management practices and protection of non-timber values
- the procedures were far too time consuming
- analytical techniques had to be strengthened

As a result, 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.

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
 - 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 from the area due to non-timber resource management objectives
 - any other information which relates to the capability of the area to produce timber

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 to 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 the information needed 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.

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- 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, he cannot allow these determinations to 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 below 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 Cassiar 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.

A *Forest Practices Code Act* for British Columbia was passed in the Legislature in July, 1994. This law 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. Practices which have recently been implemented based on current understanding of the intentions of the Code are identified in this discussion paper. Information will be provided to the chief forester on the timber supply impacts of these practices for consideration in this allowable annual cut determination. In most cases however, further implementation and experience with the Code will be required before the timber supply effects of new practices can be properly assessed, making it necessary to incorporate these factors in future allowable annual cut determinations.

The data package used for the Timber Supply Review in the Cassiar Timber Supply Area was

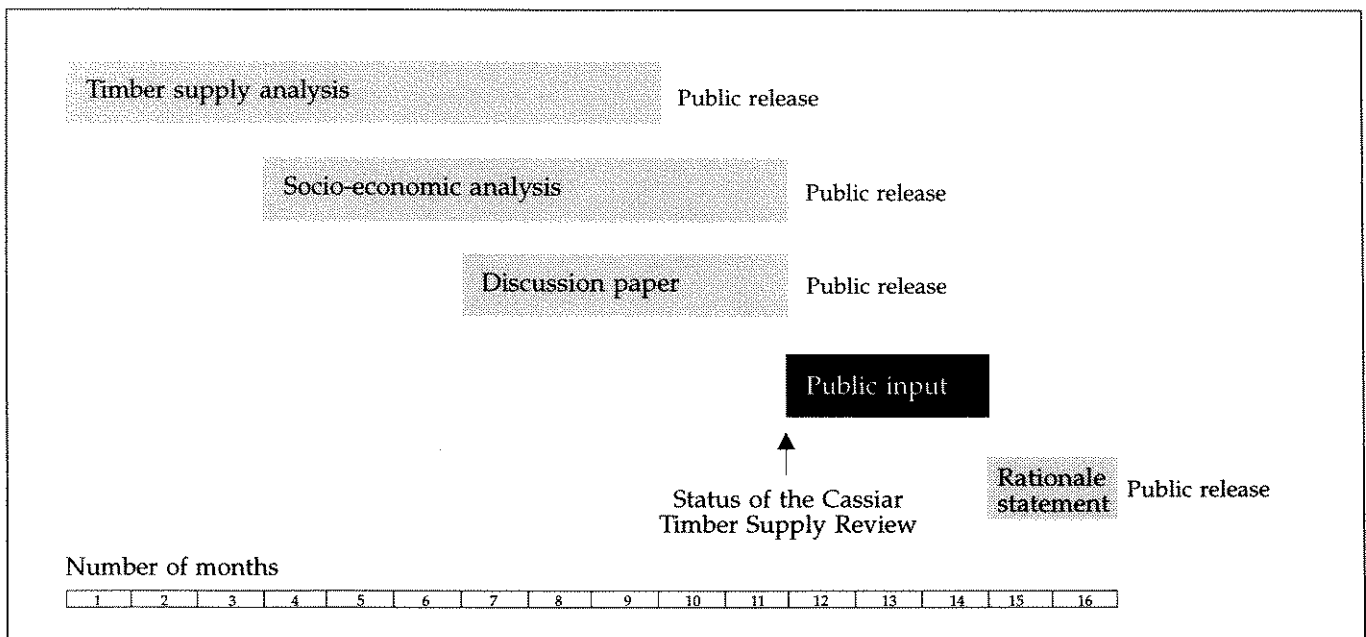


Figure 1 Steps in the Timber Supply Review process

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finalized by Forest Service staff in March, 1994. The Forest Service then conducted and released a short- and long-term timber supply analysis (*Cassiar Timber Supply Analysis*, September, 1994), and a consultant completed a socio-economic assessment of the timber supply forecasts (*Cassiar Timber Supply Area Socio-Economic Assessment*, November, 1994). Both reports are available from the Cassiar Forest District office in Dease Lake, the Atlin field office and the Prince Rupert Forest Region office in Smithers.

In conjunction with the release of this discussion paper and the socio-economic assessment, Forest Service staff will actively solicit public input to ensure the information in the Timber Supply Review for the Cassiar Timber Supply Area is correct. Input will be accepted until February 15, 1995 and will be summarized in a report to the chief forester and the minister of forests.

After weighing all of the available information, the chief forester will determine the allowable annual cut for the Cassiar Timber Supply Area during the spring of 1995. This determination and a *Rationale Statement* for the determination, will be released to the public along with a *Summary of Public Input*.

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. Implementation of major government initiatives such as the Protected Areas Strategy and the land-use recommendations of the Commission on Resources and Environment*, and 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.

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 *Timber Supply Analysis Report*; SEA is the *Socio-Economic Assessment*). Both reports are available from the Cassiar Forest District office in Dease Lake and the Prince Rupert Forest Region office in Smithers.

Description of the Cassiar Timber Supply Area

The Cassiar Timber Supply Area, the largest in the province, is located in the northwest corner of British Columbia. It is bordered by Alaska to the west, the Yukon Territory to the north and the Rocky Mountains to the east (see map on the cover). Administered by the Cassiar District office in Dease Lake and a field office in Atlin, this timber supply area covers approximately one-sixth of the entire province.

Because of its size, there is a wide range of climate and topography within the timber supply area. The coastal regions are dominated by mountainous terrain with large amounts of precipitation, while the interior is characterized by large plateaus which can be very dry.

Forest resources

Timber

The Cassiar Timber Supply Area covers approximately 13.4 million hectares. Approximately 70 per cent is non-forested tundra, rock and alpine, as Figure 2 illustrates. Of the 30 per cent that is forested, more than half is considered unavailable for harvest due to its remote location and difficult access. After additional reductions are made for wildlife management, sensitive areas, riparian areas* and existing and future roads, only 2.7 per cent of the timber supply area or 10 per cent of the forested area is available for timber management.

This timber management land base* is almost three times larger than the area used in the 1984 analysis of timber supply in the Cassiar Timber Supply Area. The difference is due to an increase in the land base considered accessible and the inclusion of balsam and hemlock forest types and pine forests growing on poor quality sites (TSAR page 8).

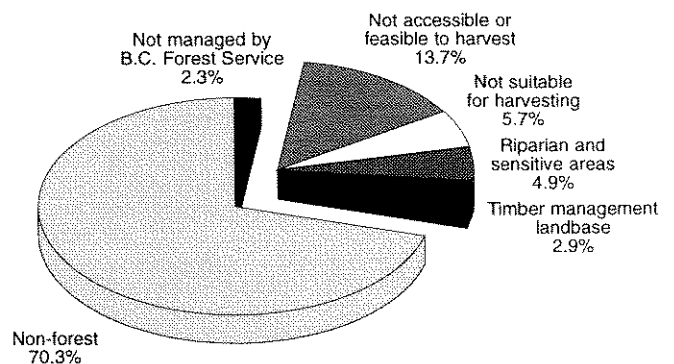


Figure 2 Land base classification

Cassiar Timber Supply Area

The timber management land base is dominated by forests of pine, spruce, hemlock and balsam with a broad range of ages. In the southern portion of the timber supply area, hemlock and balsam forests that are more than 150 years old are most common. Pine forests that are younger than 100 years old dominate the northern portion of the timber supply area. The forests in the north are younger because of frequent wildfires in this area.

Wildlife

The ecosystems in the timber supply area provide habitat for numerous wildlife species. Moose are abundant and widely distributed; Dall's and Stone's sheep and caribou also inhabit the area. Grizzly bears, black bears and wolves are common throughout the valleys. The area supports approximately half of the bird species known to the province. In fact, many bird species including the Pacific loon, gyrfalcon, lesser golden plover, Arctic tern and others breed nowhere else in British Columbia. Chinook, chum and sockeye salmon inhabit timber supply area waters, as do freshwater fish including Arctic Grayling, dolly varden, lake trout, whitefish, burbot, northern pike and white sucker (SEA page 13).

Several wildlife species within the Cassiar Timber Supply Area have been identified as being 'at risk' provincially and, in some cases, globally. A few of these species, such as the bald eagle, grizzly bear and western wolverine, commonly use habitat impacted by forestry activities (SEA page 18).

Recreation

Seven provincial parks within the timber supply area total nearly two million hectares. Five of these parks are large and roadless, offering wilderness experiences; two are considerably smaller and are located along Highway 37. In recent years, the use of all parks has been increasing. The recreation opportunities available in the timber supply area include hiking, wildlife viewing, hunting and fishing, and whitewater rafting (SEA page 18).

Current allowable annual cut

The current allowable annual cut for the Cassiar Timber Supply Area was set in 1984 at 140,000 cubic metres per year. Of this, 34,000 cubic metres are allocated to the Small Business Forest Enterprise Program, 2,000 cubic metres are for woodlot licenses (none of which have been issued), and the remaining 104,000 cubic metres are unallocated. A portion of this unallocated allowable annual cut is made available periodically through advertised timber sale licenses.

The average cut for the past three years has been 87,000 cubic metres per year (SEA page 20).

Socio-economic profile

The Cassiar Timber Supply Area is sparsely populated. In 1993, the population was estimated to range between 2,100 during the winter and 2,500 during the summer months (SEA page 4). The fluctuation results from home owners and gold and jade miners who come to the area during the summer months.

Approximately 55 to 65 per cent of the timber supply area's total population is aboriginal people affiliated with one of five First Nations groups: Liard River, Dease River, Iskut, Tahltan and Taku River Tlingit. Each group has its administrative base within the timber supply area. All of the First Nations groups are participating in the British Columbia treaty negotiation process and expect to have greater participation with the forest sector economy (SEA page 9).

Economic opportunities in the Cassiar Timber Supply Area are constrained by lack of infrastructure (e.g., transportation networks), distance to markets, and a small and scattered resident population.

The mining industry is the most important source of employment in the timber supply area, accounting for approximately 26 per cent of jobs in the area (Figure 3). Other important employment sectors are government services, accommodation, food and beverage services, and construction. Together these five sectors account for almost 75 per cent of the employment base in the timber supply area (SEA pages 4-5).

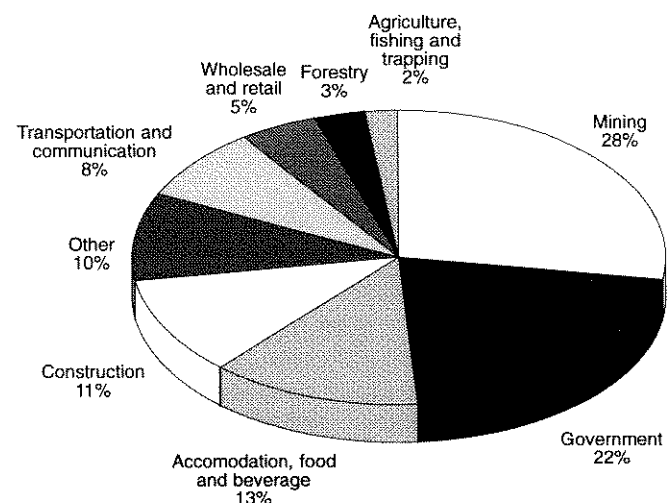


Figure 3 Employment by sector

Cassiar Timber Supply Area

The forest industry within the timber supply area is small and, to date, has operated sporadically. A small portion of the timber harvested within the timber supply area is milled locally to produce rough, green, structural lumber for local sale. The larger volumes, however, are generally harvested by non-resident contractors and shipped out of the area to processing facilities located along Highway 16, between Houston and Terrace (*SEA* pages 21-23). Some local residents are employed in logging road construction and silviculture activities.

The current average annual harvest level of 87,000 cubic metres supports approximately 12 person-years of employment and contributes \$340,000 in employment income within the timber supply area. Seven of those person-years of employment are harvesting-related, two are in forestry services (i.e. silviculture), and three are related to 'spin-off' activities, such as forestry suppliers and consumer-oriented industries (*SEA* page v).

Provincial economy and revenues

On the provincial level (which includes the timber supply area), the current harvest level is estimated to support a total of 167 person-years of employment and contribute \$4 million in employment income (*SEA* page v).

In addition, the harvest contributes \$2.4 million to the provincial government in stumpage and personal income and corporate taxes (*SEA* page v). These estimates were developed before the new Forest Renewal Plan was announced and do not include the increased stumpage revenues that will be generated through this plan. While 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 timber, range and recreation resources on public lands. BC Environment is responsible for managing fish, wildlife and water resources. 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 existing land-use designations and the current management

practices* that were being approved and implemented in the Cassiar Timber Supply Area when the data package was created. Future changes in management practices resulting from initiatives such as the Forest Practices Code or changes in land-use designations resulting from a Land and Resource Management Plan will be considered following implementation.

The current integrated forest management practices that are implemented in the timber supply area are briefly described below. The listing is not inclusive, but reflects those key practices that were included in the timber supply analysis.

Readers are encouraged to review the *Timber Supply Analysis Report* (page 14 and Appendix A) for more details.

- **Basic silviculture** - British Columbia laws require areas that are harvested and expected to produce timber in the future must be reforested with ecologically acceptable species within a specified time frame (see *TSAR* page 66 for more details). The typical silvicultural practice is to harvest; site prepare, if necessary; reforest by planting with a mix of species or by relying on natural regeneration; and control competing vegetation in the plantation. It is assumed that harvested areas will be restocked within four to five years after harvesting.
- **Forest health and unsalvaged losses** - Forest losses due to wildfire, insects, diseases and blow down are minimized as much as possible. About 7,600 cubic metres of timber is lost annually to fire damage. This is timber that cannot be salvaged or recovered. No significant loss of timber is expected as a result of either wind, forest insects or disease.
- **Timber utilization** - Merchantable timber within cutblocks is used to a 10-centimetre diameter top and a 30-centimetre stump height, for commercial species of the following size or greater:
 - 12.5-centimetre diameter at chest height for lodgepole pine
 - 17.5-centimetre diameter at chest height for all other speciesA forest is not considered merchantable until the volume reaches 140 cubic metres per hectare.
- **Minimum harvest age** - Minimum harvest age is defined as the time it takes for stands to grow to harvestable size. The minimum harvest ages used in the timber supply analysis vary by tree species and site productivity. For existing forests, these minimums range from 60 to 140 years. For regenerated forests, a range from 44 to 123 years was used.

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- **Forest cover requirements** - To promote biological diversity and minimize the visual impact, the amount of harvesting that is permitted in any area is restricted. Current practices require that a given area cannot be harvested until the regenerated forest on adjacent, previously harvested areas is at least three metres tall. Also, at any one time no more than 25 per cent of the timber management land base in the southern portion of the timber supply area can be harvested and regenerated with forest less than three metres tall. The same restriction applies to 33 per cent of the timber management land base in the northern portion.
- **Viewscape** - Many timber supply areas have landscape inventories along major highway corridors, around major population centers and from high-use areas such as parks. These inventories define the management practices necessary to minimize the impacts of forest harvesting on the viewshed. The Cassiar Timber Supply Area did not have a landscape inventory available when this analysis was completed.

Although a landscape inventory isn't available, the Cassiar Forest District has placed a 500-metre no-harvest zone on each side of Highway 37; this amounts to 27,030 hectares. In the southern portion of the timber supply area, a four-pass harvesting system is being used to minimize the visual effects of harvesting in areas that are visible from provincial parks such as Mt. Edziza. The major rivers within the timber supply area such as the Iskut and Dease have 150-metre buffers on each side to minimize the visual impacts of harvesting in the vicinity of these rivers.

- **Fish and wildlife** - Streamside or riparian areas are protected and maintained by removing these areas from the timber management land base. Approximately 2.5 per cent of the total productive forest was deducted for this reason from the timber management land base for the Cassiar Timber Supply Area (TSAR page 9).

Old-growth forest cover requirements are not currently necessary in the Cassiar Timber Supply Area because of the large expanses of wilderness, areas which are inaccessible to forestry activities and many other land base reductions that ensure the protection of wildlife habitat. Integrated resource management plans within the area also ensure wildlife habitats are linked so that the natural migration of wildlife continues to occur.

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 harvests to sustainable levels. The base case forecast and the critical factors described below are part of the information that will be used by the chief forester to determine the allowable annual cut for the next five years.

Base case forecast

To complete a timber supply analysis for the Cassiar Timber Supply Area, a computer model was used to attempt to generate a base case timber supply forecast which met the following conditions:

- it maintained the projected harvest at the highest possible level
- the timber supply forecast was not allowed to decline below the initial level

In the Cassiar Timber Supply Area, the present allowable annual cut can be maintained or increased without causing timber supply shortfalls in the future. The base case timber supply forecast illustrated in Figure 4 indicates an initial rate of harvest of 842,400 cubic metres per year, approximately six times greater than the present allowable annual cut of 140,000 cubic metres per year. This timber supply level can be maintained for 70 years before it increases to reach the long-term harvest level of 867,000 cubic metres per year (TSAR page 21).

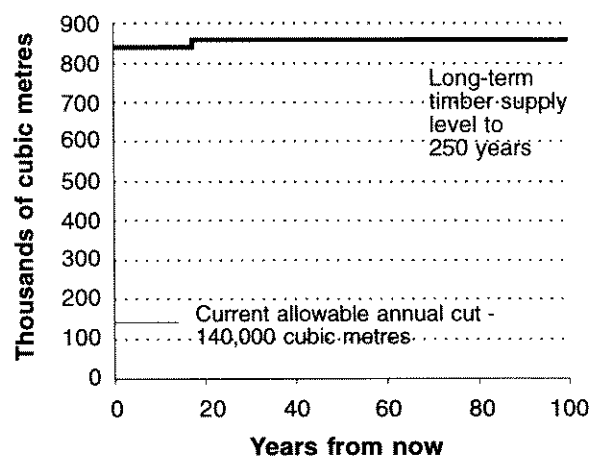


Figure 4 Base case timber supply forecast

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Critical factors

When the information for the timber supply analysis was collected in 1993, there were concerns about the uncertain nature of some of the data. The potential of some of these uncertainties to affect the timber supply forecast was tested by changing the values for certain critical factors in the analysis. Some of these changed values altered the timber supply forecast greatly, particularly in the short term.

Since the analysis, local Forest Service staff have further examined the information that was used for these critical factors. Their perspectives are outlined in the following discussion. Other factors in the analysis were tested and are discussed in the *Timber Supply Analysis Report* (see pages 21-34) 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.

Factors affecting the size of the timber management land base

In the Cassiar Timber Supply Area, the process of defining the timber management land base is complicated by the size of the area, the lack of historical experience in the area and the lack of up-to-date, detailed data as described below.

- **Defining the economically accessible land base**

Although the Cassiar Timber Supply Area is the largest in the province, much of the area is not forested, and other areas are remote and inaccessible. The following factors were considered to define the area that is economically accessible:

- whether the area is forested
- current road access
- presence of terrain such as mountain ranges that prohibit road access
- whether road access is possible using current road construction technology and cost allowances

Broad watershed areas were classified based on these factors. It is possible that within these larger areas that are classified as economically accessible, there are relatively small sites that should be excluded from the timber management land base, but it is not possible to identify these sites with the available information.

- **Defining the harvestable land base**

During the short history of harvesting in the Cassiar Timber Supply Area, only ground-based harvesting methods, such as wheeled skidders, which cannot operate on steep slopes, have been used. While much of the economically accessible land base in the Cassiar Timber Supply Area can be harvested with ground-based equipment, some areas can only be harvested using other methods such as cable harvesting, and other areas cannot be harvested with any of the current methods.

The terrain information that is necessary to accurately determine how much of the area cannot be harvested using current methods is not available. Cassiar Forest District staff estimate that 10 to 30 per cent of the economically accessible land base cannot be harvested with current harvesting methods. No adjustment to the land base in the timber supply analysis was made to account for this factor.

- **Deducting areas required to manage non-timber resources**

Another step in defining the timber management land base is to identify areas that must be reserved from harvesting to protect non-timber resources, and deduct these areas from the database for the timber supply analysis. There are concerns that in the following areas, deductions from the timber management land base may not be adequate to manage non-timber resources.

- **Riparian areas**

Riparian areas are important wildlife habitats and they provide natural filters for sediment and debris which may be transported from harvested areas. For the timber supply analysis, a 150-metre buffer on both sides of rivers and streams that contain salmon or sport fish was deducted from the timber management land base. A 20-metre buffer was deducted for other streams. Riparian areas around lakes that are larger than 400 hectares were also deducted from the database.

- **Environmentally sensitive areas**

When the data for the timber supply analysis was prepared, maps were available for only approximately 15 per cent of the timber supply area to identify environmentally sensitive areas that have special wildlife values, soil conditions, or forest regeneration. The amount of environmentally sensitive area on these maps was extrapolated to define the total sensitive area that was deducted from the timber management land base.

- **Visually sensitive areas**

As described in Current Practices, detailed mapping of visually sensitive areas is not available for the Cassiar Timber Supply Area.

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• Defining merchantable forests

Only merchantable forests where the value of the timber is greater than the cost of harvesting and reforestation are included in the timber management land base for a timber supply analysis. However, due to relatively outdated forest inventory information in the Cassiar Timber Supply Area, and lack of local experience with harvesting and reforestation, it is difficult to identify merchantable and non-merchantable forests in this area.

The identification of merchantable forests also shifts over time as timber values and the costs of harvesting and reforestation change. In the Cassiar Timber Supply Area it is particularly difficult to classify forests with low timber volumes, and those growing on poor sites.

In the timber supply analysis, Cassiar Forest District staff tested the impacts of 30 and 50 per cent increases and reductions in the size of the land base. In all cases the timber supply impact is directly proportional to the size of the increase or decrease in the land base (i.e. a 30 per cent reduction in the land base creates a 30 per cent reduction in the forecasted timber supply), illustrating the importance of ensuring the timber management land base is accurately defined.

Factors affecting the reliability of available information about the forest

The short history of forest management in the Cassiar Timber Supply Area has made it difficult to collect the type of detailed information about the forests that is required to complete an accurate timber supply analysis. Two factors are of particular concern to Cassiar Forest District staff.

• Forest inventory

The current forest inventory, which describes the species, ages and size of the existing forests, was completed in the mid 1970s. This inventory has been updated periodically to record wildfires and forestry activities, and to incorporate new information, such as sensitive site mapping. Given the size and diversity of the Cassiar Timber Supply Area, it is likely that this inventory data is not entirely accurate. However it was used in the timber supply analysis as it was the best information available at the time.

• Timber growth estimates

The short history of timber harvesting and forestry activities in the Cassiar Timber Supply Area makes it impossible to confirm the estimates of timber growth and merchantable volume used in the timber supply analysis. Tests were completed in the timber supply analysis to evaluate the impact of changes to these growth estimates.

When the estimated merchantable timber volumes in the existing mature forests were increased, the impact on the timber supply forecast was as follows:

- a 10 per cent increase in volume created a 4.5 per cent higher timber supply forecast over the first 70 years, to 880,400 cubic metres
- a 25 per cent increase in volume created a seven per cent higher timber supply forecast over the first 70 years, to 924,400 cubic metres.

Figure 5 illustrates the impacts of reducing the estimated merchantable timber volumes in the existing mature forests.

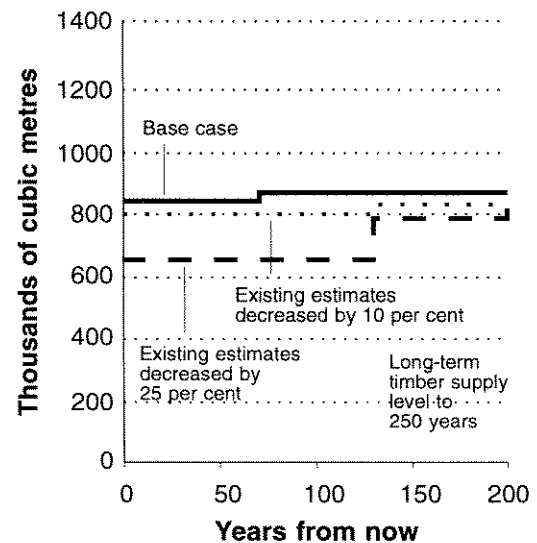


Figure 5 Impacts of reducing the estimates of merchantable timber volume in the existing mature forests

Changing the estimated timber volumes for regenerated forests also affected the timber supply forecast. Table 1 summarizes these impacts.

Change in estimated merchantable volume	Timber supply impact
Increase volume estimates by 10 or 25 per cent	No impact on short-term timber supply; timber supply increased by same per cent after 140 years
Reduce volume estimates by 10 per cent	Timber supply reduced to 782,400 cubic metres (seven per cent below the initial base case level)
Reduce volume estimates by 25 per cent	Timber supply reduced to 682,400 cubic metres (19 per cent below the initial base case level)

Table 1 Impacts of changing the estimated merchantable timber volume in regenerated forests.

Cassiar Timber Supply Area

Environmental and socio-economic impacts

Environmental impacts

Because of the limited quantity of non-timber resource inventory information in the timber supply area, it is difficult to comment on how increased harvest levels may impact wildlife populations and habitat.

In general, existing forest management practices tend to reduce the amount of mature or older forests. Under the base case forecast, most of the older forest included in the timber management land base will be converted to younger forest within the next 100 years. Once converted, the majority of this regenerated forest will be harvested before it can provide the same conditions as an older, mature forest. From a wildlife standpoint, the conversion of older forests to younger forests may cause changes in species distribution and population levels. These possible impacts will be minimized through the retention of riparian areas, protection of high use wildlife habitats and the distribution of forestry activities over the entire timber supply area.

Also of concern from an environmental standpoint is the effect of improved access to previously remote areas that will occur as a result of increased timber harvest levels. Areas that become accessible through new logging roads could be significantly impacted. Fish and wildlife populations may suffer due to changes in predator/prey relationships and/or increased human use. Careful planning of road building and deactivation will help to reduce the long-term effects on fish and wildlife populations.

It is important to note that these environmental implications only relate to the timber management land base, which is approximately three per cent of the Cassiar Timber Supply Area.

First Nations impacts

Higher harvest levels may lead to more economic opportunities for First Nations through involvement in the forest industry. The specific impacts that First Nations' communities could experience would depend on what role they choose to take, and their geographic proximity to forest harvesting and manufacturing activities. First Nations will have to weigh the economic benefits associated with involvement in the forest industry against any impacts on their traditional way of life.

Community impacts

For the purpose of the socio-economic analysis, two hypothetical allowable annual cut levels were chosen: 240,000 cubic metres per year and 640,000 cubic metres per year.

At an allowable annual cut level of 240,000 cubic metres per year, the majority of the increased economic activity would occur outside of the timber supply area. It is assumed that much of the harvesting would still be undertaken by contractors from neighboring timber supply areas, and almost all of the processing would occur at mills along the Highway 16 corridor from Houston to Terrace.

In this situation, it is estimated that total employment within the timber supply area would increase from the current level of 12 person-years to 56 person-years. Harvesting, forestry services and some small-scale milling would account for 42 person-years, while the other 14 are associated with spin-off economic activities, i.e. forestry suppliers and consumer-oriented industries. Total employment income would be \$1.52 million, an increase of \$1.18 million over the current situation (SEA page 41).

At an allowable annual cut level of 640,000 cubic metres per year, it is assumed that the timber supply area's economy would already be larger and more diversified and would have experienced considerable infrastructure development. Thus, the analysis assumed that the timber supply area's share of harvesting, processing and forestry services employment would increase to 50 per cent, from its current share of 13 per cent. Included as part of this increase is the development of a large wood processing facility within the timber supply area.

Based on these assumptions, a level of 640,000 cubic metres would support total employment of 349 person-years, more than a six-fold increase over the employment achieved at the 240,000-cubic-metre harvest level. Harvesting and forestry services would account for 115 person-years, while processing would contribute 131 person-years. Another 103 person-years are associated with spin-off economic activities. Total employment income would be \$9.24 million (SEA page 41).

The effects of these economic opportunities on specific communities would depend to a large degree on the amount of investment in the local communities by the forest industry. A community that acquires a large wood processing facility would most likely experience the greatest increase in population, infrastructure, private industry and social services.

Cassiar Timber Supply Area

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

Provincial impacts

At the provincial level, it is estimated that an allowable annual cut of 240,000 cubic metres would support a total of 462 person-years of employment and contribute approximately \$11.1 million in employment income. If the level increased to 640,000 cubic metres, it would support an estimated 1,232 person-years of employment and contribute \$29.5 million in employment income (SEA page 39).

Provincial government revenues are projected to be \$6.6 million with an allowable annual cut of 240,000 cubic metres. They would reach \$17.5 million annually if the level was increased to 640,000 cubic metres. These estimates do not include expected increased stumpage revenues from the recently announced Forest Renewal Plan (SEA page 39).

Chief forester's determination

Several alternatives exist for the chief forester to adjust the short-term allowable annual cut as part of a strategy to achieve the long-term timber supply level:

- the allowable annual cut could be maintained at the present level
- small increases could be implemented now, with larger increases in the future
- a consistent level of increase could occur over the next 50 years
- a very large increase could be made now, with no future increases

The chief forester must decide what the short-term allowable annual cut should be as part of the strategy to phase in the long-term adjustment.

Other forest management initiatives

Other initiatives such as the Protected Areas Strategy have the potential to change land-use designations and forest management practices, both of which may impact future timber supply. If these changes significantly impact the timber supply in the Cassiar Timber Supply Area, these impacts will be assessed in the next timber supply review within five years.

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 you feel are relevant.

If you prefer, additional comments or a detailed submission can be written on separate pages. Feedback is welcome on any aspects of this discussion paper, the *Timber Supply Analysis Report*, the *Socio-Economic Assessment* and other topics related to the timber supply in the Cassiar Timber Supply Area. Forest district staff would be pleased to discuss questions or concerns that you may have 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 February 15, 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.

Gary W. Miltenberger R.P.F.
District Manager
Cassiar Forest District
Stikine and Commercial
P.O. Box 247
Dease Lake, B.C.
V0C 1L0
Phone: (604) 771-4211

Discussion Paper Response Form

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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 Cassiar Timber Supply Area. Further information on the critical factors outlined on pages six to eight in this paper would be most helpful.

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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

Address (optional)

Gary W. Miltenberger R.P.F.
District Manager
Cassiar Forest District
Stikine and Commercial
P.O. Box 247
Dease Lake, B.C.
V0C 1L0
Phone: (604) 771-4211

