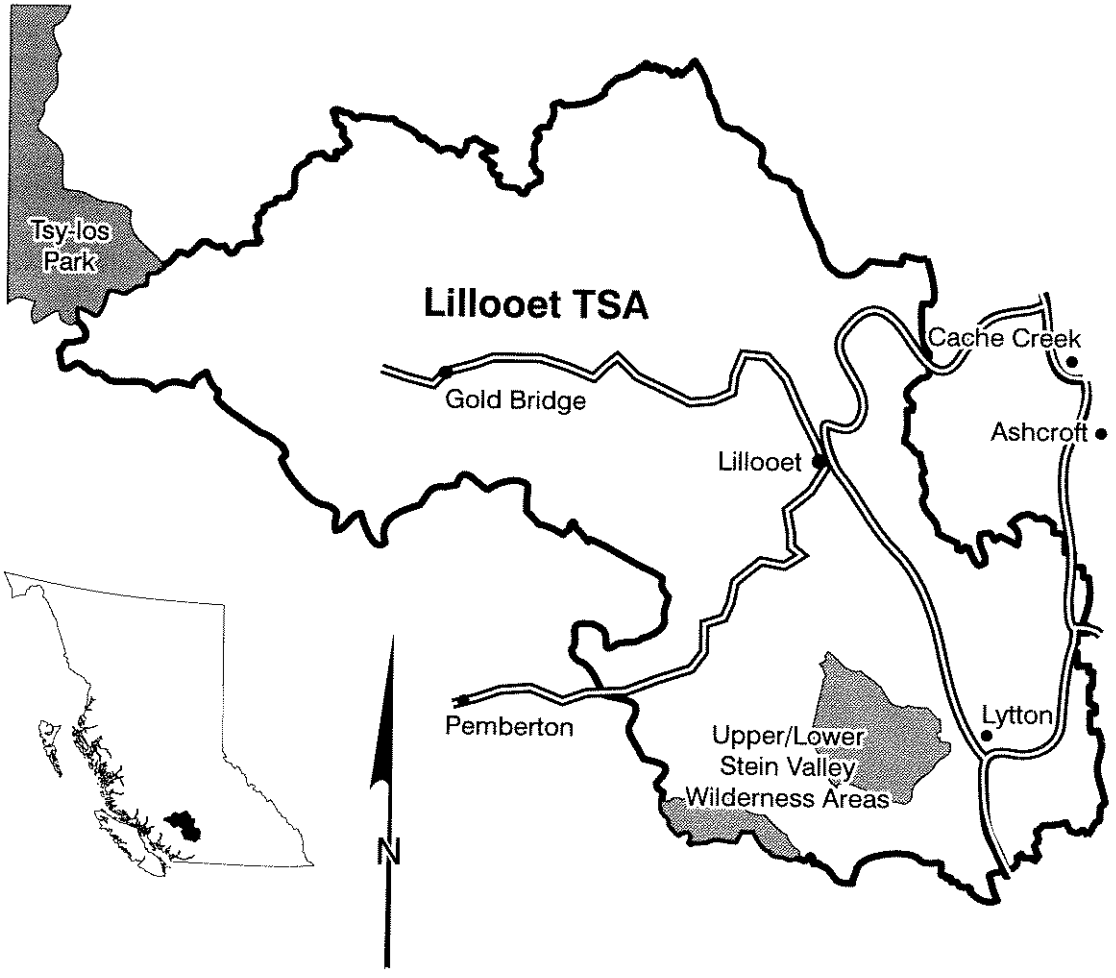
MINISTRY OF FORESTS

Lillooet Timber Supply Area

Timber Supply Review Discussion Paper
July 1995



Province of British Columbia
Ministry of Forests

Lillooet Timber Supply Area

Timber Supply Review Highlights

After the *Lillooet Timber Supply Area Timber Supply Analysis Report* was released in December 1993, errors were discovered in the computer coding used to define the timber harvesting land base for the original analysis. As well, forest management practices have changed in the Lillooet Timber Supply Area since this analysis was completed. A *Timber Supply Analysis Addendum* has been prepared with corrected computer coding and expanded analysis of the timber supply impacts of changes in forest management practices. The *Addendum* is being distributed with this *Discussion Paper*. The data and forecasts included in this *Discussion Paper* are from the revised analysis.

- The British Columbia Forest Service is reviewing the timber supply for 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 adjust the allowable annual cut* for the Lillooet Timber Supply Area.

- The current allowable annual cut in the Lillooet Timber Supply Area was set in 1988 at 650,000 cubic metres per year. The 1993 harvest of 636,000 cubic metres supported an estimated 483 person-years* of direct forestry employment in the timber supply area and an additional 158 person-years of employment in the supplier, service and retail sectors through forestry sector spending. An additional 503 person-years of direct employment and 1,317 person-years of spin-off employment were estimated to be created outside the Lillooet Timber Supply Area. (page 5)

- The base case* timber supply forecast predicts the current allowable annual cut can be maintained for 30 years. Then the timber supply is projected to decline eight per cent every 10 years for the next 70 years, until the long-term sustainable level of 362,600 cubic metres per year is reached. (page 7)

- Forest Service staff are concerned about the accuracy of some of the information used in the timber supply analysis. Particularly, they are of the opinion that the size of the timber harvesting land base may have been overestimated while the amount of existing mature timber in the timber harvesting land base may be underestimated. (pages 7 and 8)

- Additional factors suggest the short-term timber supply may be lower than initially predicted:
  - changes in integrated resource management* practices that have occurred since the timber supply analysis was completed
  - the combined impacts of a reduced timber harvesting land base and new practices (pages 8 and 9)

- There may be some opportunities to partially offset projected reductions in the timber supply by:
  - increasing the use of non-conventional harvesting methods on steep, sensitive sites where traditional methods are unacceptable
  - implementing intensive silvicultural treatments or commercial thinning (page 10)

- The implications of adjustments in the timber supply on local communities is an important consideration in this review. The town of Lillooet has recognized that continued heavy reliance on forestry may lead to instability, particularly given the declines in timber harvesting that may occur. The community has encouraged local land use planning and economic development initiatives to create other options. (page 11)

- The chief forester must determine an allowable annual cut as part of a strategy to achieve the projected long-term sustainable timber supply level. The base case forecast provides one alternative, but the chief forester may select another harvest level based on his consideration of the factors required under Section 7 of the *Forest Act*, listed on pages 1 and 2 of this discussion paper.

- The available timber supply in the Lillooet Timber Supply Area is also influenced by the deferral of harvesting in areas under consideration in the Protected Areas Strategy and where negotiations with First Nations are ongoing. Until final decisions are made, in the timber supply analysis it was assumed that these areas are available for timber harvesting. If, in the future, these areas are designated for protection, the allowable annual cut will be reassessed and adjusted if necessary. (page 12)

- By law, another review of the timber supply in the Lillooet Timber Supply Area must be completed within five years to incorporate decisions from these initiatives and new information on the impact of different forest management practices.

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

Definitions

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

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

Current forest management practices
Forest practices that were being approved and implemented in the area when this review was initiated. These practices are described in this paper beginning on page 5.

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

Forest Practices Code
A law which requires better forest practices, with heavy penalties for violators. The code will be implemented June 15, 1995.

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.

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 government initiative to protect representative ecosystems and special features on a regional basis.

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

Selection management
A system used to maintain or create forests containing a wide range of tree ages or sizes.

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 which provides for the establishment, management and harvesting of timber by a private interest on a described area of Crown land in accordance with the *Forest Act*.

Lillooet Timber Supply Area

Introduction

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

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

This discussion paper summarizes the technical reports from the Timber Supply Review in the Lillooet Timber Supply Area and encourages British Columbians to comment on the findings. Public comments will be accepted until October 9, 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 fully account for integrated resource management practices and protection of non-timber values
- the procedures were far too time-consuming
- analytical techniques had to be strengthened

The study also showed that because of these procedural weaknesses, very few timber supply analyses had been completed since the early 1980s, with few allowable annual cut adjustments.

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

The chief forester's responsibility

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

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

- The new Forest Renewal Plan 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 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 allowable annual cut 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 when determining allowable annual cuts. In these determinations, the chief forester considers relevant information from any source, including interest groups. However, these determinations cannot be inappropriately influenced by the advocacy efforts of any group.

Timber supply review process

The Timber Supply Review is an improvement over past methods, with better information and superior analytical techniques. The process was designed to stimulate public discussion through the release of reports and this discussion paper, and to accommodate new information, techniques and ideas. A five-step process has been developed for the Timber Supply Review in timber supply areas:

1. Timber Supply Analysis
2. Socio-Economic Analysis
3. Public Discussion Paper
4. Public review and input
5. Allowable annual cut determination and Rationale Statement

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

A commitment to incorporate change

The *Forest Act* requires the chief forester to reassess the allowable annual cut for each timber supply area and tree farm licence area at least every five years after this review is completed to incorporate new information, new practices and government policies. Implementation of major government initiatives such as the Forest Practices Code, Protected Areas Strategy 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.

The *Forest Practices Code of British Columbia Act* became law on June 15, 1995 and is now being implemented. The Code requires better forest practices throughout the province, with 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 Lillooet 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 of 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.

Timber Supply Review in the Lillooet Timber Supply Area

The data package used for the Timber Supply Review in the Lillooet Timber Supply Area was finalized by Forest Service staff in October 1993 and was reviewed by local timber tenure holders. The Forest Service then conducted and released a short- and long-term timber supply analysis (*Lillooet Timber Supply Analysis Report*, December 1993) which included timber supply forecasts.

After the Lillooet Timber Supply Area Timber Supply Analysis Report was released, errors were discovered in the computer coding used to define the timber harvesting land base for the original analysis.

As well, forest management practices have changed in the Lillooet Timber Supply Area since this analysis was completed. A Timber Supply Analysis Addendum has been prepared with corrected computer coding and expanded analysis of the timber supply impacts of changes in forest management practices. The Addendum is being distributed with this Discussion Paper. The data and forecasts included in this Discussion Paper are from the revised analysis.

When the re-analysis of the timber supply was completed, the Forest Service finalized a socio-economic analysis of the timber supply forecasts that had been undertaken by a consultant (*Lillooet Timber Supply Area Socio-Economic Analysis*, July 1995). All three reports are available from the Lillooet Forest District office, the Kamloops Forest Region office and Timber Supply Branch in Victoria.

In conjunction with the release of this discussion paper, the *Timber Supply Analysis Addendum* and the *Socio-Economic Analysis*, Forest Service staff will actively solicit public input to ensure the information in the Timber Supply Review for the Lillooet Timber Supply Area is correct. Input will be accepted until October 9, 1995 and will be summarized in a report to the chief forester and the minister of forests.

After considering the available information, the chief forester will determine the allowable annual cut for the Lillooet Timber Supply Area early in 1996. This determination and a *Rationale Statement* for the determination will be released along with the *Summary of Public Input*.

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

Description of the Lillooet Timber Supply Area

The Lillooet Timber Supply Area is located in the south-western portion of British Columbia. It is bounded by the Pacific Range to the west, the Southern Chilcotin Mountain Range to the north, the Cascade Mountains to the south, and the Clear and Marble Ranges to the east. Due to the mountainous terrain, the climate and ecology of the area vary greatly. The western portion of the timber supply area includes wet coastal conditions and drier interior mountain ranges, while the eastern portion has the characteristic low rainfall of the interior dry belt.

Timber

The varying climate and mountainous terrain create diverse forests with a variety of tree species. Lodgepole pine, interior Douglas-fir and spruce are the most common mature species, with lesser amounts of Ponderosa pine, white bark pine, balsam, cedar and hemlock.

The mountainous terrain in much of the timber supply area limits the size of the timber harvesting land base*. Figure 1 illustrates that most of the land base is not available for timber harvesting because it is either not Crown land, not forested or not suitable for timber harvesting due to environmental sensitivity, rough terrain, difficult access or low timber values. The remaining 25 per cent of the total land base is suitable for timber harvesting using current methods and is included in the timber harvesting land base. (*TSAAR* page 2)

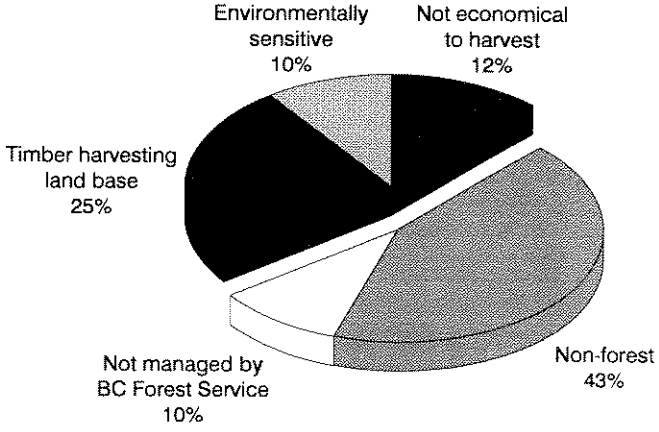


Figure 1 *Classification of land in the Lillooet Timber Supply Area*

Notes: Total area: 1,123,800 hectares
As government decisions on the land-use designation of the Mid-Stein and Spruce Lake areas, two study areas for the Protected Areas Strategy, have not yet been made, these areas were included in the timber harvesting land base for this analysis.

The initial timber supply analysis was based on a timber harvesting land base of 304,580 hectares. The revised analysis in the addendum report used a timber harvesting land base of 278,178 hectares.

Wildlife and fisheries

The timber harvesting land base in the Lillooet Timber Supply Area contains diverse forests which provide important habitat for a wide variety of wildlife species including deer, grizzly and black bear, bighorn sheep, mountain goat, moose, elk, small mammals and many bird species. Seton, Anderson, Carpenter and Downton Lakes, the Fraser, Stein,

Thompson and Bridge rivers and numerous smaller rivers, streams and lakes provide important habitat for salmon, rainbow trout, whitefish, kokanee, bull trout and sturgeon. (*SEA* pages 23-24)

Tourism and recreation

Tourism and recreational opportunities abound in the Lillooet Timber Supply Area because of the spectacular mountain scenery, as well as special features such as Spruce Lake and the Stein Valley—internationally recognized backcountry areas. Activities such as hiking, horseback riding, mountain climbing, mountain biking, glacier viewing, heli-hiking, heli-skiing, kayaking and whitewater rafting are popular. More common activities include boating, camping, hunting, fishing, walking and car touring, particularly along the Duffey corridor and the Fraser River. In the winter, snowmobiling and cross-country skiing are popular, particularly in the Gold Bridge/ Spruce Lake and Joffre Lakes areas. (*SEA* pages 17-18)

Current allowable annual cut

The allowable annual cut for the Lillooet Timber Supply Area was set in 1988 at 650,000 cubic metres per year. Approximately 72 per cent of the allowable annual cut is allocated to three long-term renewable licences and 23 per cent is harvested through the Small Business Forest Enterprise Program administered by the Forest Service. The remaining five per cent is divided between temporary licences, woodlots and an unallocated reserve. (*SEA* page 29)

In addition to the timber harvesting rights allocated under the allowable annual cut, a recent pulpwood agreement authorizes harvesting of 25,000 cubic metres per year of pulpwood from a portion of the timber supply area. Because there had not been any harvesting under this agreement when the revised timber supply analysis was completed, pulpwood harvesting was not considered current practice and was not included in the timber supply analysis.

Socio-economic profile

It is estimated that 5,680 people live within the Lillooet Timber Supply Area, with the major population centre being the village of Lillooet.

First Nations

The three First Nations in the timber supply area (the Stl'atl'imx, the Nl'aka'pamux and the Shuswap) include 13 bands. Approximately 2,700 people reside in First Nations communities in the timber supply area, mainly near Lillooet and Lytton. Many are employed in the forest sector, either as employees or independent contractors; about 35 per cent of the mill employees in the timber supply area are First Nations people. (*SEA* page 11)

First Nations people pursue many of the traditional, cultural and spiritual uses of the land in this timber supply area. At the same time, the First Nations are interested in the long-term prosperity of the forest industry. Treaty negotiations are a means of resolving these issues.

Local economy

The local economy depends significantly on the forest industry, particularly in Lillooet where 28 per cent of the current employment depends on the forest sector. Figure 2 illustrates the employment generated by each sector within the timber supply area in 1991. (*SEA* page 7)

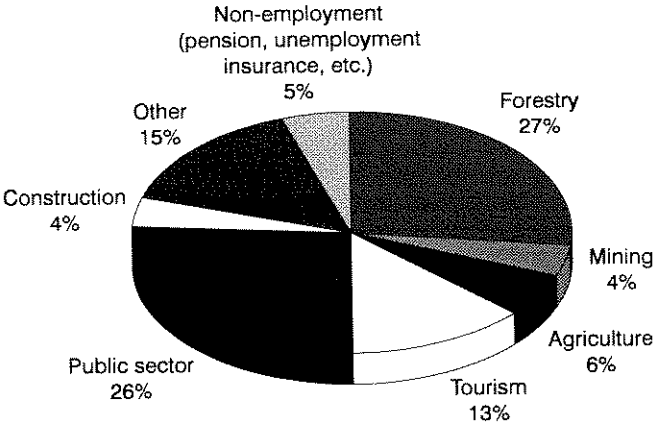


Figure 2 Sources of employment within the timber supply area

B.C. Rail is the second largest employer in the timber supply area. Over the past several years, the volume of passenger and tourist traffic through the area has increased notably. (*SEA* page 20)

Tourism is the third largest sector in the Lillooet Timber Supply Area and has excellent growth potential. Outstanding and varied landscapes within travelling distance of the Lower Mainland and the Trans-Canada Highway create a variety of tourism opportunities. (*SEA* page 17)

Timber industry

The wood-processing industry in the timber supply area includes a veneer plant and sawmill in Lillooet, sawmills in Lytton and Boston Bar (the latter is located outside the timber supply area but relies partly on timber from it), and a value-added operation in Lillooet that manufactures home components for the Japanese prefabricated housing industry. During 1992, the major timber companies secured approximately 38 per cent of their mill

requirements from their licences in the Lillooet Timber Supply Area. (*SEA* page 30)

The 1993 harvest of 636,000 cubic metres from the timber supply area supported approximately 483 person-years of direct forestry employment. An additional 159 person-years of employment were estimated to be created in the supply, service and retail sectors in the timber supply area through forestry sector spending. (*SEA* page 34)

Provincial economy and revenues

Harvesting and processing timber from the Lillooet Timber Supply Area plus forestry sector spending is estimated to create a total of 2,462 person-years of employment provincially (including employment within the timber supply area). (*SEA* page 37)

Approximately $20.6 million in provincial revenues is generated annually by timber harvesting in the Lillooet Timber Supply Area. This figure is based on the 1994 average total fees for harvesting public timber in the area ($15.71 per cubic metre), plus personal income taxes and other tax revenues such as sales tax and corporate income tax. (*SEA* page 39) These estimates include the increased stumpage revenues being generated to fund the Forest Renewal Plan.

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. The Ministry of Environment, Lands and Parks is responsible for management of fish, wildlife, water resources and parks. Both agencies subscribe to the principle of integrated resource management, where all resources are considered before management decisions are made.

Both of the timber supply analyses completed for this review are based on existing land-use designations and the management practices being approved and implemented in the timber supply area in 1992. Since that time, changes in practices have resulted from initiatives such as Local Resource Use Plans, visual landscape management planning and the implementation of harvesting guidelines. In recent months, practices have been revised to be consistent with the Forest Practices Code Act. These changes are noted where they are important to this review. Readers are encouraged to review the original *Timber Supply Analysis Report* (pages 4-12 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 an analysis of the different types of forests and the range of practices in the Lillooet Timber Supply Area. The area in each zone was estimated from existing plans and the guidelines for integrated resource management in the timber supply area. Site specific practices implemented in any one area may differ from the general practices represented in the analysis.

Figure 3 illustrates the area within each of the zones. The information used in the analysis to describe the integrated resource management practices in each zone is described below.

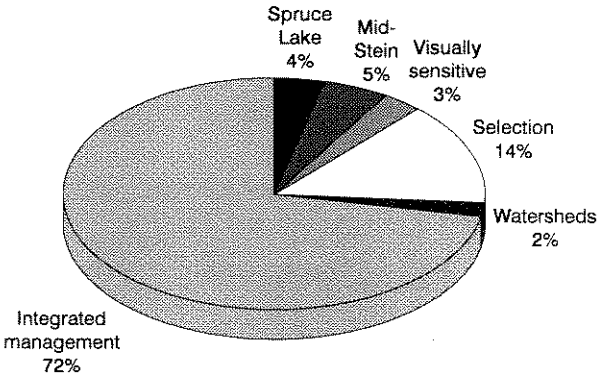


Figure 3 Area in each management zone

- **Spruce Lake** (10,536 hectares) — an approved study area under the Protected Areas Strategy with wilderness and back-country recreation values, mineral potential and timber values. A moratorium on timber harvesting has been in place since 1981 when an Integrated Resource Management Plan deferred further development until the year 2000 for most of this area. As the status of the area has not yet been determined, it was assumed to be available for harvesting. In the timber supply analysis, a maximum of 33 per cent of the timber harvesting land base in this area was permitted to be harvested and regenerated with forests less than three metres tall at any time.
- **Mid-Stein** (13,736 hectares) — an unroaded area with wilderness values, cultural features and old-growth forests. Located between two existing wilderness areas, it has been the subject of study and contention for over 20 years. Although harvesting was approved in 1976 and 1987, it is now a study area under the Protected Areas Strategy. Timber harvesting and other development are not permitted in the area.

Because of its uncertain status when the timber supply analysis was completed, the Mid-Stein was assumed to be available for harvesting. Due to hydrological and other forest values in the area, the community watershed practices were applied: no more than 24 per cent of the timber harvesting land base was permitted to have forests less than six metres tall at any time.

- **Community watersheds** (6,200 hectares) — includes community watersheds for Lytton, Lillooet, Spences Bridge and Gold Bridge. The management objectives are to maintain the watershed in a sufficiently greened-up state, through controlled harvesting, to achieve water quality and quantity objectives necessary for drinking water. In the timber supply analysis, no more than 24 per cent of the timber harvesting land base in this zone was permitted to have forests less than six metres tall at any time.

- **Selection management* zone** (36,535 hectares) — Douglas-fir forests on dry sites in the timber supply area where selection management is used to encourage forest regeneration. In the timber supply analysis, it was estimated that 40 per cent of the timber volume is harvested from each cutblock during the first entry and, following that, a constant volume is harvested every 30 years.

- **Visually sensitive zone** (7,756 hectares) — areas visible from major centres and highway corridors as well as selected backcountry areas where the scenic landscape is considered to be particularly important. In the timber supply analysis, no more than 14 per cent of the timber harvesting land base in this zone was permitted to have forests less than six metres tall at any time.

- **Integrated resource management zone** (188,355 hectares) — areas not assigned to other zones. The management emphasis is on timber harvesting provided management objectives for non-timber resources can be achieved. In the timber supply analysis, no more than 33 per cent of the timber harvesting land base in this zone was permitted to have forests less than three metres tall at any time.

Other practices

The following forest management practices are used in all management zones and were included in the timber supply analysis.

- **Wildlife** - Wildlife habitat requirements were accounted for in the timber supply analysis by requiring that 20 per cent of the timber harvesting land base has trees older than 80 years at all times and by deducting sensitive wildlife areas from the database for the analysis. Trees which provide wildlife habitat such as snags and large, old trees are retained on cutblocks.

- **Basic silviculture** - British Columbia laws require that harvested areas which are expected to produce timber in the future must be reforested with ecologically acceptable species within a specified time frame. The most common silvicultural practices on moist sites are to clearcut harvest, prepare the site for reforestation if needed, then plant and brush if needed. On interior dry belt Douglas-fir sites, selection management using partial cutting harvesting techniques is used.

- **Harvestable ages** - Minimum harvestable age is defined as the time it takes for forests to grow to harvestable size based on minimum average tree size and volume per hectare. The minimum harvestable ages used in this timber supply analysis range from 80 years for lodgepole pine to 120 years for other species.

- **Green-up** - To provide wildlife cover and promote watershed stability, the forest cover in a harvested area must be at least three metres tall before the adjacent timber can be harvested.

- **Forest health and unsalvaged losses** - Losses of timber to fire, wind damage, insects, disease and animals are minimized, and damaged timber is salvaged where and when feasible. Annual losses which are not salvaged are estimated to be 26,500 cubic metres per year based on the average losses over a number of years. The actual loss fluctuates depending on pest populations, weather and other factors.

- **Timber utilization** - Within areas that are clearcut, all coniferous trees that are greater than the following dimensions and that can be manufactured into lumber are considered merchantable and must be removed:
  - 10 centimetre top diameter
  - 15 centimetre stump diameter for lodgepole pine; 20 centimetre stump diameter for all other species

- **Soil conservation** - Harvesting layout follows provincial guidelines which limit the amount of land that can be occupied by roads, landings and skid trails. For the timber supply analysis, almost 12 per cent of areas with forests less than 40 years old and 1.5 per cent of areas with forests older than 40 years within the timber harvesting land base were deducted from the database to account for roads, trails and landings that have become non-productive through harvesting. To account for future roads, landings and trails, areas with forests older than 40 years were reduced by a further 8.1 per cent.

Timber supply forecasts and critical factors

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

Base case timber supply forecast

To complete the timber supply analysis for the Lillooet Timber Supply Area, a computer model was used to generate a base case* timber supply forecast using the following principles:

- maintain the current allowable annual cut, or if this was not possible, find the maximum initial harvest level
- if the predicted long-term sustainable timber supply was lower than the initial harvest level, reduce the timber supply within a defined range of eight to 12 per cent per decade, until the long-term level was reached
- if possible, maintain the timber supply level at or above the predicted long-run sustainable level at all times

Based on the best available information about the forest management practices in 1992 when the timber supply analysis was initiated, the base case timber supply forecast for the Lillooet Timber Supply Area indicates the current allowable annual cut cannot be maintained over the long term. Within 90 years, the timber supply is projected to decline to a long-term sustainable level of 362,600 cubic metres per year.

There are many ways to phase in this long-term reduction in timber supply in the Lillooet Timber Supply Area. Figure 4 illustrates the base case timber supply forecast which projects the current allowable annual cut can be maintained for 30 years, followed by an eight per cent decline every 10 years for the next 70 years until the long-term sustainable level is reached. (*TSAAR* pages 1-3) However, critical factors that were not assessed in the timber supply analysis may significantly affect the projected short-term timber supply. These factors will be considered by the chief forester in the allowable annual cut determination

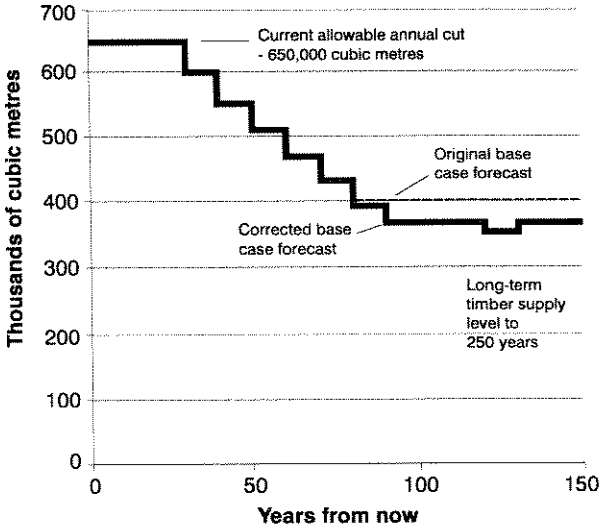


Figure 4 Base case timber supply forecast

Examining critical factors

Since 1992 when the data was prepared for the timber supply analysis, Forest Service staff have collected more information for some of the factors in the analysis. Also, tests completed during the timber supply analysis identified factors that had the greatest effect on the timber supply forecasts. These critical factors are discussed in this section.

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

Accuracy of the land base and timber information

The forest land base in the Lillooet Timber Supply Area ranges from grasslands with scattered trees to coastal rain forests, and from flat plateaus to very steep mountains. This diversity makes it difficult to prepare accurate information for some factors in the timber supply analysis. District staff are concerned about the accuracy of the following factors:

- **Area within the timber harvesting land base**
  The following factors made it difficult to estimate the area within the timber harvesting land base in the Lillooet Timber Supply Area:
  - **lack of detailed studies**
    In 1992, when the data was prepared for the timber supply analysis, the area that was feasible and economical to harvest due to terrain and other physical considerations was estimated by Forest Service staff because a detailed study of the timber supply area was not available at that

time. A study is underway to confirm the accuracy of the estimates used in the timber supply analysis.

- **expensive road access**
  The mountainous, steep terrain in this area makes road access expensive to construct and maintain. In some drainages it may not be economical to construct roads, which may limit harvesting options and reduce the size of the timber harvesting land base.

- **estimated deductions for roads, trails and landings**
  For the timber supply analysis, an average of 10 per cent of the forested land base was deducted from the timber harvesting land base to account for roads, trails and landings. Reducing this estimate would increase the size of the timber harvesting land base.

It is the opinion of Forest District staff that the timber harvesting land base may be overestimated in the timber supply analysis. Figure 5 illustrates the impact of reductions in the size of the timber harvesting land base. (*TSAAR* page 4)

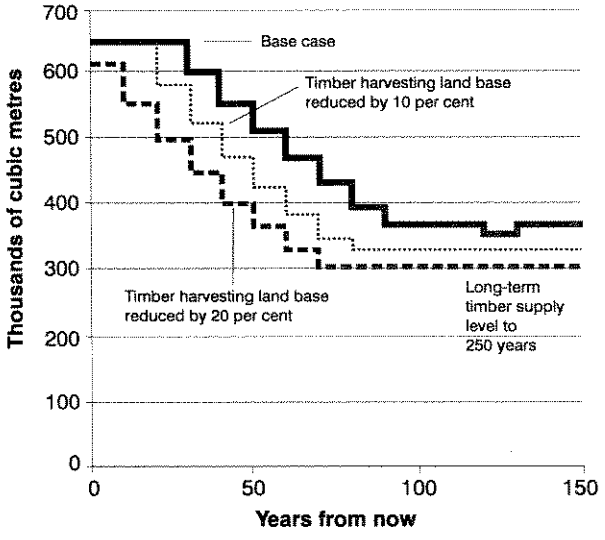


Figure 5 *Impacts of reductions in the size of the timber harvesting land base*

Timber inventory

Since 1992 when the data was prepared for the timber supply analysis, areas previously classified as poor quality growing sites have been reassessed and in some cases their classifications have changed. It is not known what the impact of these reclassifications would be on the timber supply forecasts.

In addition, preliminary studies indicate the existing inventory information may underestimate the amount of mature timber in the total area within the Lillooet Timber Supply Area. It is unclear how this information relates specifically to the timber on the timber harvesting land base. Figure 6 illustrates the timber supply impacts of changes in the estimates of mature timber in the timber harvesting land base. (*TSAAR* page 7)

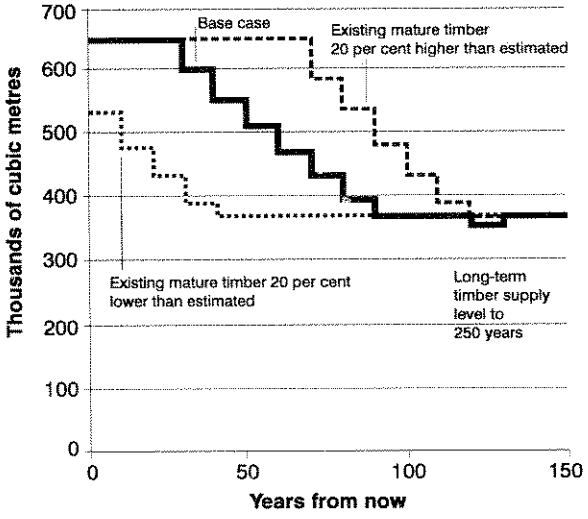


Figure 6 *Impact of changes in the estimates of mature timber in the timber harvesting land base*

Critical factors that indicate a reduction in the short-term timber supply compared to the base case

Changes in practices in the integrated resource management zone

Since 1992 when the data was prepared for the timber supply analysis, several of the integrated resource management practices have changed in the Lillooet Timber Supply Area. The new practices and their estimated impacts on timber supply include:

- **Riparian* and streamside buffers**
  Buffer areas along streams and riparian areas where timber harvesting is restricted are now required in the Lillooet Timber Supply Area. This reduces the area within the timber harvesting land base. It has not yet been possible to estimate the area required for streamside buffers in the Lillooet Timber Supply Area.

- **Area and practices in community watersheds**
  In the timber supply analysis, two per cent of the timber harvesting land base (6,200 hectares) was designated as community watersheds where more restrictive timber harvesting practices are required. Since the analysis was initiated, an additional 18 community watersheds have been identified covering approximately 24,000 hectares, including land that is not within the timber harvesting land base.

In addition, the forest cover requirements in watersheds have become more restrictive to timber harvesting. In the future, the minimum height regenerated forests must reach before adjacent timber can be harvested may be taller than the six metres used in the timber supply analysis. The timber supply impacts of these changes were not evaluated in the timber supply analysis.

- **Increased forest cover requirements**
  Changes in practices regarding the maximum size and distribution of cutblocks and the amount of area that can be cut over at any one time, and the addition of requirements to maintain areas in old-growth condition, have limited the amount of timber harvesting that can occur in the integrated resource management zone at any one time.

In the timber supply analysis, it was estimated that the timber in this zone could be removed in three harvest entries, with approximately 33 per cent of the mature timber being removed in each entry. Current management plans indicate that four or five passes will be required, with less area harvested in each entry. A four-pass harvesting system did not change the base case timber supply forecast. Figure 7 illustrates the timber supply impacts of a five-pass system. (*TSAAR* page 3)

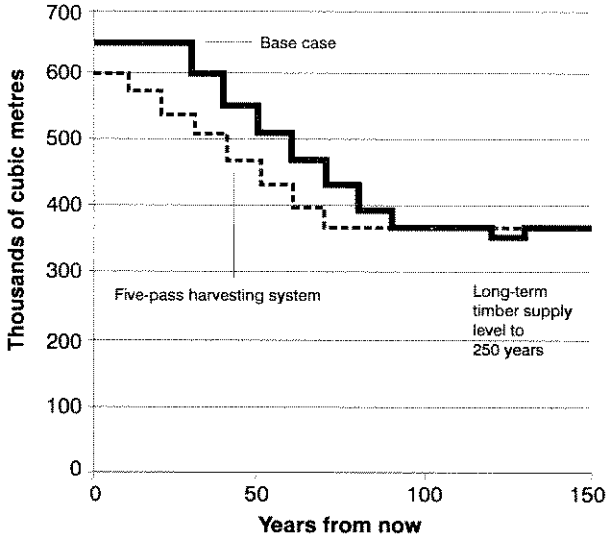


Figure 7 Impacts of a five-pass harvesting system

- **Pulpwood harvesting**
  Harvesting initiated under the new pulpwood agreement in the northeastern portion of the timber supply area may increase the timber supply impacts of these requirements. Availability of sawlog quality timber may be restricted while the areas harvested for pulpwood are reforested and grow to fulfil the minimum height requirements.

- **Other practices**
  Additional changes, such as the need to retain dead trees and patches of uncut timber to provide wildlife habitat on cutblocks, also have an impact on timber supply by reducing the amount of timber volume that is available for harvesting.

Combined impacts

The size of the timber harvesting land base may be overestimated in the timber supply analysis and a four- or five-pass harvesting system may be required to meet the integrated resource management objectives in the Lillooet Timber Supply Area. Figure 8 illustrates the combined impacts of these two factors on the projected timber supply. (*TSAAR* pages 4-6)

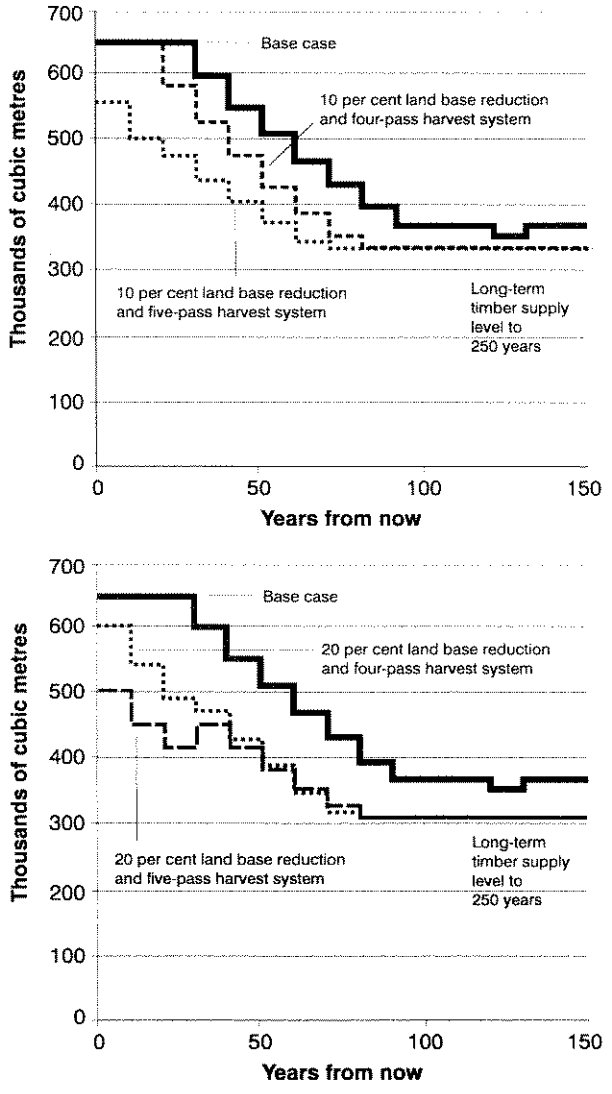


Figure 8 Combined impacts of a smaller timber harvesting land base and increased number of entries

Possible opportunities to partially offset reductions in timber supply

Harvesting practices for steep slopes
Much of the timber harvesting land base within the Lillooet Timber Supply Area is very steep, often with unstable, sensitive soils, making traditional ground-based harvesting methods environmentally unsound. Non-conventional harvesting methods such as helicopters or skyline systems may make it possible to harvest these areas without detrimental environmental impacts. These systems also require less road construction. This would increase the timber harvesting land base and the available mature timber.

Intensive silvicultural treatments
Few regenerated stands have grown to maturity in the Lillooet Timber Supply Area, or in the interior of British Columbia, making it difficult to estimate the amount of merchantable timber that can be expected from these areas. There are opinions that planting and stand tending practices (juvenile spacing, fertilization, etc.) may produce a growth rate for regenerated forests that is higher than the estimates used in the timber supply analysis. This may result in an increase in timber supply.

A test of the possible impacts of a 10 per cent increase in the growth of regenerated stands in the Lillooet Timber Supply Area indicated an increase in the long-term timber supply can be expected in about 80 years but the projected short-term timber supply did not change (*TSAR* page 27). The impacts of a larger increase in the growth rate of regenerated stands was not tested. Expecting a larger increase may not be realistic given the influence of factors such as root rot and the need to manage for biological diversity in plantations.

The Timber Supply Review was designed to assess the timber supply impacts of current practices. As a result, the range of intensive silvicultural treatments that might be implemented in the Lillooet Timber Supply Area was not examined. Further analyses are required to examine the potential opportunities for intensive silvicultural treatments and the implications of those treatments on timber supply and other resources.

Commercial thinning
The feasibility of commercial thinning in the Lillooet Timber Supply Area is limited by the area of younger forests and the steep slopes. Approximately 10 per cent of the timber harvesting land base has forests between 40 and 80 years old which might be candidates for commercial thinning. Only a small portion of these forests are on gentler slopes where commercial thinning may be possible.

Environmental and socio-economic implications

Environmental concerns

The base case timber supply forecast indicates that, within 100 years, most of the old-growth and mature forests in the timber harvesting land base will have been harvested and converted to young forests. As the most productive forests, from a biodiversity standpoint, are in the timber harvesting land base, Ministry of Environment, Lands and Parks staff predict this will lead to a loss of biodiversity and possible declines in the populations and distributions of wildlife species dependent on older forests. Linkage corridors between seasonal habitats for some species could also be disrupted by timber harvesting. Relatively adaptable species and species that thrive in younger forests will likely increase. (*SEA* pages 50-54)

Logging roads may lead to greater recreational access, further disturbing wildlife populations and habitat. (*SEA* page 56)

The potential for soil erosion and hydrological impacts on fisheries habitat and domestic water is also of concern. (*SEA* pages 54-55)

Reduced harvest levels would be preferred from an environmental perspective due to the lower risk to wildlife and fish habitat and populations, watersheds, terrain and visual landscapes, and preserving more flexibility for future resource management and land use initiatives. (*SEA* page 57)

Community implications

The implication of changes in the allowable annual cut on local communities is an important consideration in the Timber Supply Review. For the *Socio-Economic Analysis* it was assumed that the economic impacts of a change in timber supply would be directly related to the size of the reduction or increase in timber supply (i.e., a 10 per cent reduction in timber supply would result in a 10 per cent reduction in forest-related employment).

This timber supply analysis indicates the current allowable annual cut for the Lillooet Timber Supply Area cannot be maintained in the long term. Lillooet and Lytton depend on the forest industry and would be affected by reductions in the harvest level. However, there may be time for these communities to plan for lower harvests. Both communities have recognized the need to diversify their economies and have initiated community-based processes to address this challenge. The recently announced Forest Renewal Plan is also providing new employment opportunities.

The impacts of the base case on the tourism sector and recreational activities are difficult to gauge. Lillooet's tourism and recreation marketing relies on natural features which can be adversely affected by timber harvesting. It is important to recognize the need to preserve these features. On the other hand, forestry can complement some forms of recreation by, for example, providing access roads. Generally speaking, lower levels of harvesting are probably beneficial for tourism and wilderness-based recreation, but the nature of the trade-off is difficult to assess. (*SEA* pages vi, 40-41)

First Nations implications

Some First Nations people believe reduced logging would better preserve their cultural, heritage and spiritual values. Some also believe immediate harvest reductions are desirable until land claim issues are settled.

First Nations, however, would be negatively affected in economic terms by lowered timber supply levels. First Nations people account for over 35 per cent of mill employment within the timber supply area and several First Nations people are independent contractors involved in harvesting and silviculture activities.

Several bands are currently seeking and developing forestry-related opportunities to create employment for their members. For example, six bands from the Nl'aka'pamux Nation have jointly entered into a proposal for a forest licence with a local forest company. Also, the Lytton Indian Band has recently opened a school to instruct band members on renewable resource management, particularly forest management.

Provincial implications

As the base case forecast indicates the current allowable annual cut may be maintained for 30 years, followed by a gradual decline, no immediate employment impacts are predicted. It is estimated that province-wide, total employment (including within the Lillooet Timber Supply Area) may fall by 1,057 person-years over 90 years as the timber supply declines to the long-term, sustainable level. This estimate is based on continuation of current practices and manufacturing processes. It is estimated that provincial government revenues may decline by about $9.0 million over the same period.

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 pages 1 and 2 of this paper.

Factors which may impact timber supply in the future

Several areas within the Lillooet Timber Supply Area are currently deferred from harvesting while processes are underway to resolve resource use issues. To avoid pre-judging government land use decisions, the timber supply impacts of these deferrals could not be considered in this review. However, this information is provided to indicate processes which may impact timber supply in the future.

- **Protected Areas Strategy**
  Several areas within the Lillooet Timber Supply are currently being assessed for protected status under the Protected Areas Strategy. These include the Spruce Lake and Mid-Stein areas, both approved study areas where harvesting has been deferred for as long as 20 years. Approximately nine per cent of the timber harvesting land base, with approximately 12 per cent of the mature timber volume, is included in these two areas. During the deferral period, timber harvesting has been concentrated in other areas where new integrated management objectives now limit further harvesting.

  In addition, 18 areas of interest have been identified within the timber supply area where harvesting is also currently deferred pending land-use decisions. These areas include approximately 10 per cent of the timber harvesting land base and approximately 13 per cent of the mature timber.

  Until final decisions are made for these areas it is not possible to consider the impact of these decisions on the timber supply in the Timber Supply Review. These areas have therefore been included in the timber harvesting land base for this review.

- **Negotiations with First Nations**
  Harvesting is currently deferred in the Pavilion, Fountain and Siska areas until aboriginal rights have been addressed. Harvesting in Camoo Creek is also currently not possible while negotiations proceed. These areas include approximately four per cent of the timber harvesting land base and the same proportion of the existing mature timber volume.

  Until final decisions are made by government, these areas must be included in the timber harvesting land base for the timber supply analysis.

- **Land and Resource Management Plan**
  A Land and Resource Management Planning process will be initiated in the Lillooet Timber Supply Area sometime after the Timber Supply Review is completed. This process provides an opportunity for the public and interest groups to work with government agencies to make choices about future management objectives and practices for public forest land in B.C. New management practices will be assessed and approved by government through the LRMP process. If these decisions require changes to land use or forest management practices that significantly impact the timber supply in the Lillooet Timber Supply Area, these impacts will be included in the next allowable annual cut review.

Your input is needed

The allowable annual cut 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 may be written on separate pages.

Feedback is welcomed on any aspect of this discussion paper, the *Timber Supply Analysis Report,* the *Timber Supply Analysis Addendum,* the *Socio-Economic Analysis* and other topics related to the timber supply in the Lillooet Timber Supply Area. Forest Service staff would be pleased to discuss questions or concerns you may have that would help you prepare your response.

Please mail the completed response form and your comments to the forest district manager at the address below. Your comments will be accepted until October 9, 1995.

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

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

For more information, contact:

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Lillooet 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 Lillooet 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 October 9, 1995.

A. Economic and social objectives

Please use the space below to provide your comments regarding the economic and social objectives you believe should be considered in determining the allowable annual cut for the Lillooet 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 Lillooet Timber Supply Area. Further information on the critical factors outlined on pages seven to ten 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:

Dan Donaldson
District Manager
Lillooet Forest District
Bag 700
Lillooet, B.C. V0K 1VO
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