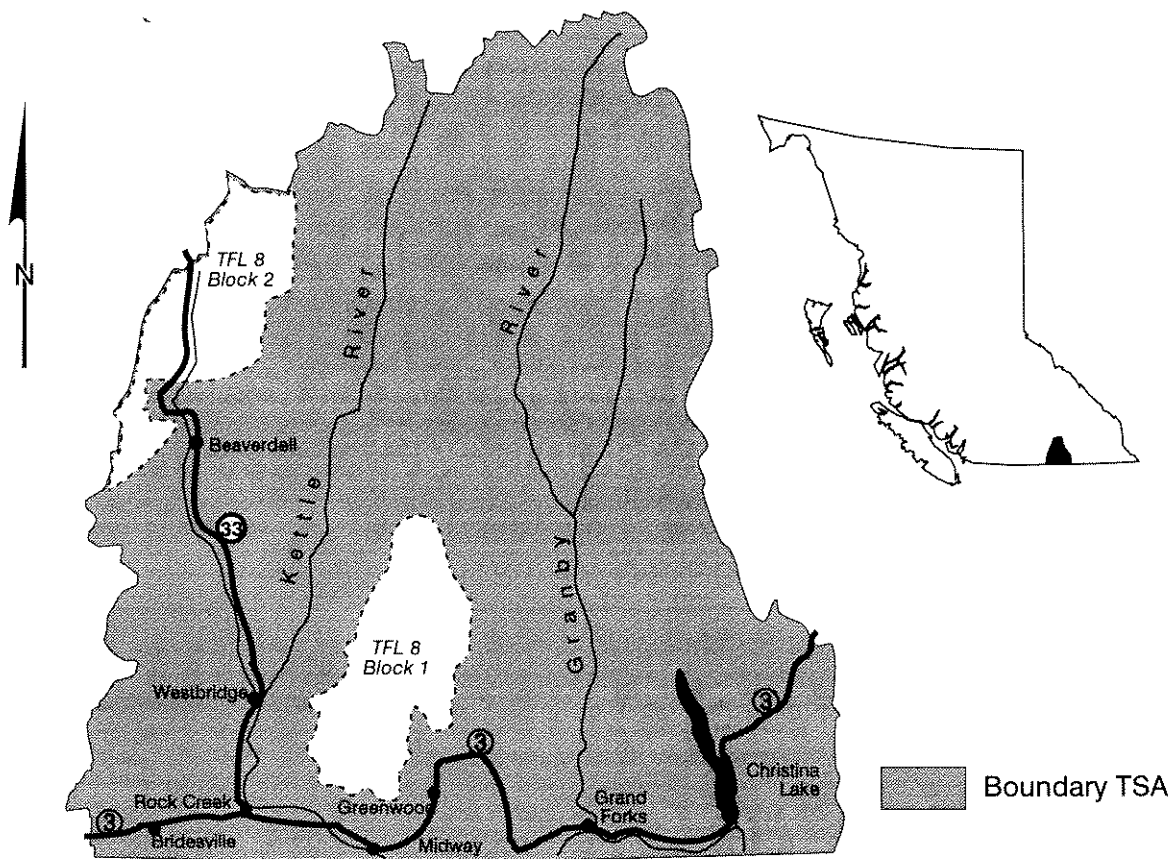




MINISTRY OF FORESTS

Boundary Timber Supply Area

Timber Supply Review Discussion Paper
December 1994



Province of
British Columbia
Ministry
of Forests

Boundary Timber Supply Area

Timber Supply Review Highlights

- The British Columbia Forest Service is reviewing the timber supply in all timber supply areas* and tree farm licence* areas in the province. This review examines the impacts of current 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 Boundary Timber Supply Area.
 - In the Boundary Timber Supply Area, the current allowable annual cut was increased for 1993 to 1995 from 700,000 cubic metres per year to 900,000 cubic metres per year to permit prompt harvesting of timber damaged by mountain pine beetles. Although the actual harvest level increased in 1993, a major decline in the beetle population has occurred, so the harvest level has returned to 700,000 cubic metres in 1994. (page 5)
 - It is estimated that harvesting and processing timber from the Boundary Timber Supply Area generates approximately 518 direct person-years* of employment in the forest sector in the area. An additional 210 person-years of indirect employment are estimated to be created in the area through spending by forest companies and their employees. A further 847 person-years of direct and indirect employment are estimated to be created outside the timber supply area. (page 5)
 - The timber supply analysis indicates it is not possible to maintain the elevated harvest level of 900,000 cubic metres per year without drastic timber supply shortfalls in the future. (page 8)
 - The base case* timber supply forecast indicates the current allowable annual cut of 700,000 cubic metres per year may be maintained for 80 years. Timber supply is then projected to decline over 20 years to the long-term level of 560,000 cubic metres per year. (page 8)
 - There is the potential that several factors may reduce the timber available for harvesting in the next decade, which may necessitate an immediate reduction in the allowable annual cut:
 - reduced estimates of the amount of merchantable timber in the existing mature forests (page 8)
 - revised practices that reduce the amount of timber harvesting permitted in an area at any one time (page 8)
 - new wildlife management practices (page 9)
 - increased protection of riparian* areas (page 10)
 - revised estimates for timber losses to root rots (page 10)
 - There may be opportunities to partially offset reductions in timber supply by:
 - harvesting areas not currently considered economical or feasible to harvest (page 11)
 - implementing a commercial thinning* program (page 11)
 - increasing the amount of timber removed from each cutover area (page 11)
 - Silvicultural treatments (e.g., juvenile spacing, fertilization) or new estimates of the growth rates of managed forests in the Boundary Timber Supply Area are unlikely to increase the short-term timber supply although they will increase the timber supply in the long term. (page 12)
 - The impact of adjustments in the timber supply on local communities is an important consideration in this review. Opportunities to further diversify the local economy look promising. In the long term, the local economy may be sufficiently diversified to absorb any future timber supply reductions. The challenge for these communities is to develop strategies to minimize the impacts of this transition. (page 12)
 - Other initiatives which may influence the timber supply in the Boundary Timber Supply Area include:
 - the Forest Practices Code*, which is to be implemented in the coming months, and
 - the Land Use Plan that will be developed by the provincial government from the recommendations of the Commission on Resources and Environment (CORE)*.
- Where possible the impacts of these initiatives will be considered in this allowable annual cut determination. In most cases, further information will be required before the impacts from these initiatives can be defined. The next review of the timber supply in the Boundary Timber Supply Area will be completed within five years to incorporate these changes, as well as new information about the impact of different forest management practices and the results of the Land and Resource Management Planning* process expected to be implemented sometime after this review is completed.

* 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

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

Commercial thinning

A partial cut in older, immature forests where trees have reached merchantable size; it is designed to maximize the growth of the remaining stems.

Commission on Resources and Environment (CORE)

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

Current forest management practices

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

Environmentally sensitive areas

Environmentally sensitive areas are mapped as land requiring special management attention to protect important recreation and scenic values, fish and wildlife resources, sensitive soils and unstable slopes.

Forest cover requirement

The requirement that forest stands with a certain age, size or number of stems per hectare be maintained within a forest over time.

Forest licence

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

Forest Practices Code

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

Green-up

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

Integrated resource management

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

Land and Resource Management Plan

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

Partial cutting harvesting

Harvesting practices where a portion of the trees are removed at one time.

Person-year

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

Protected Areas Strategy

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

Riparian areas

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

Selection silvicultural system

A silvicultural system used to maintain or create areas containing a wide range of tree ages or sizes. The time interval between harvests in such areas is fairly short (usually less than 30 years) and during these harvests, either single or scattered trees or small groups of trees are removed from across the entire area.

Timber management land base

Crown forest land within the timber supply area that is currently considered feasible and economical for long-term timber harvesting. In the *Timber Supply Analysis Report* this area was called the timber harvesting land base because this is where the majority of the timber harvesting occurs.

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 defined area of Crown land.

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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
- to identify where improved information is required to make reliable forecasts
- to 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 Boundary Timber Supply Area and encourages British Columbians to comment on the findings. Public comments will be accepted until March 19, 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 licence areas:

- 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 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 designed to help achieve sustainability:

- The *Forest Renewal Plan* is a partnership of all the forest interests, working together to invest in increasing the value of the forests and strengthening the forest sector economy.
- The *Forest Practices Code* creates a single enforceable law to require better forest practices, with heavy penalties for violators.
- The *Timber Supply Review* is providing 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, the chief forester cannot be inappropriately influenced in these determinations by the advocacy efforts of any group.

Timber Supply Review process

The Timber Supply Review is an improvement over past methods, with better information and superior analytical techniques. The process was designed to stimulate public discussion through the release of reports and this discussion paper, and to accommodate new information, techniques and ideas. Figure 1 illustrates the five-step process that has been developed for the Timber Supply Review in timber supply areas. The diagram also indicates the status of

the Timber Supply Review for the Boundary Timber Supply Area and the estimated time required to complete each step in the process.

As the legal mandate for allowable annual cut determinations for tree farm licence areas is the same as for timber supply areas, the Timber Supply Review process for tree farm licences is based on similar principles, but it has been designed to reflect the management role of these licensees.

A commitment to incorporate change

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.

Other major government initiatives such as the Protected Areas Strategy, the Commission on Resources and Environment (CORE) and Land and Resource Management Plans may also have significant impacts on timber supply in specific timber supply areas and tree farm licence areas.

Where possible, information will be provided to the chief forester on the timber supply impacts of the actual and expected changes in practices resulting from these initiatives for consideration in this allowable annual cut determination. In most cases,

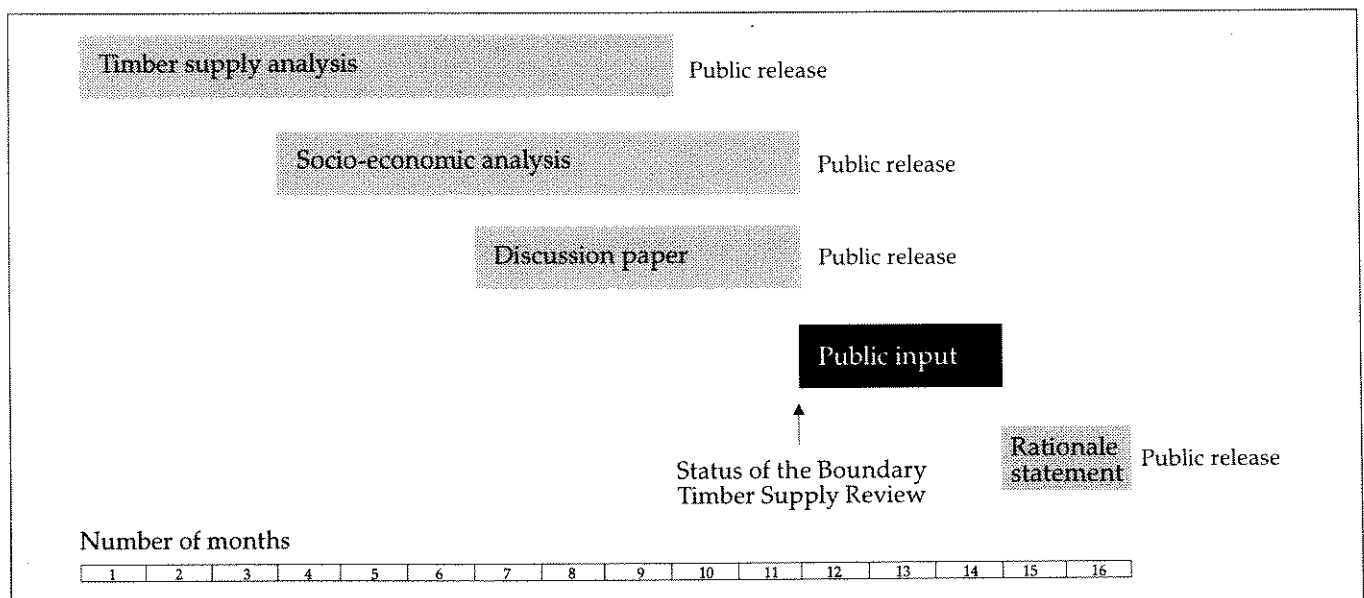


Figure 1 Steps in the Timber Supply Review process

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further implementation and experience will be required before the timber supply effects of these initiatives can be properly assessed, making it necessary to incorporate these factors in future allowable annual cut determinations. 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 new government policies. Where the timber supply impacts of these initiatives are significant the chief forester may decide to determine the allowable annual cut more frequently than every five years.

Timber Supply Review in the Boundary Timber Supply Area

The data package used for the Timber Supply Review in the Boundary Timber Supply Area was finalized by Forest Service staff in March 1994, and made available for public review. The Forest Service then conducted a short- and long-term timber supply analysis (*Boundary Timber Supply Area Timber Supply Analysis*, December 1994). A consultant then completed a socio-economic analysis of the timber supply forecasts (*Socio-Economic Analysis of the Boundary Timber Supply Analysis*, December 1994). Both reports are available from the Boundary Forest District office in Grand Forks and at the Nelson Forest Region office.

On October 31, 1994, the Commission on Resources and Environment announced their recommendations for land use and resource management for the West Kootenay-Boundary Region. The Commission's report calls for the designation of the Granby and Gladstone study areas within the Boundary Timber Supply Area as protected areas. It also recommends some forest management objectives and practices that differ from the current practices that were assessed in this review. Where possible, these differences are identified in this discussion paper. The government is expected to announce a Land-Use Plan resulting from the Commission's recommendations early in 1995.

In conjunction with the release of these reports and this discussion paper, Forest Service staff will actively solicit public input to ensure the information in the Timber Supply Review is correct. Input will be accepted until March 19, 1995. Public input will be summarized in a report to the chief forester and the minister of forests.

Information will be provided to the chief forester on the timber supply impacts of the actual and expected changes in practices resulting from the Forest Practices Code and the Land Use Plan for consideration in this allowable annual cut determination. In most cases however, further implementation and experience with these initiatives 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.

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

Throughout this discussion paper the page numbers from the technical reports are provided so that you can refer to them for additional information (*TSAR* is the *Timber Supply Analysis Report*; *SEA* is the *Socio-Economic Analysis*). Both reports are available from the Boundary Forest District office in Grand Forks and the Nelson Forest Region office in Nelson.

Description of the Boundary Timber Supply Area

The Boundary Timber Supply Area is located in south-central British Columbia, along the border with the United States. This area includes the cities of Grand Forks and Greenwood, the village of Midway, and smaller communities such as Bridesville, Rock Creek, Westbridge, Beaverdell and Christina Lake. The geographic feature linking the area is the Kettle River system.

Forest resources

The Boundary Timber Supply Area encompasses approximately 580,000 hectares. Figure 2 shows that 54 per cent of the area is presently suitable for harvesting using current methods. Although much of the remaining area is forested, 20 per cent is not suitable for timber harvesting because of key recreational features (approximately 1 per cent), severe reforestation difficulties, rough terrain, difficult access, unmerchantable timber or environmental sensitivity, including slope instability. (*TSAR* page 7)

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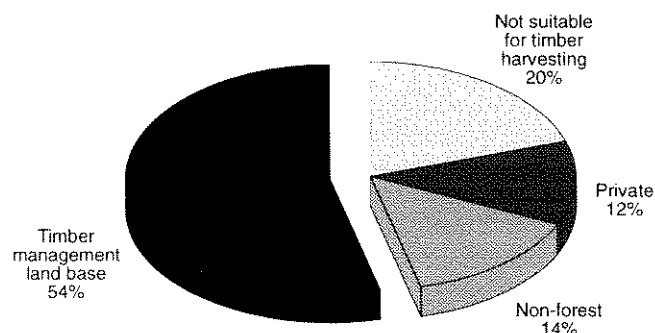


Figure 2 Land classification in the Boundary Timber Supply Area

Notes: As land-use decisions have not been finalized for candidate or study areas under the Protected Areas Strategy, these areas were not deducted from the land base for this review. These areas occupy approximately 75,000 hectares of the total land base or approximately six per cent (18,000 hectares) of the timber management land base.

The forests in the Boundary Timber Supply Area are unusually diverse, as illustrated in Figure 3. Lodgepole pine is the most common commercial tree species; it occurs in stands mixed with other species and in large tracts of pure lodgepole pine.

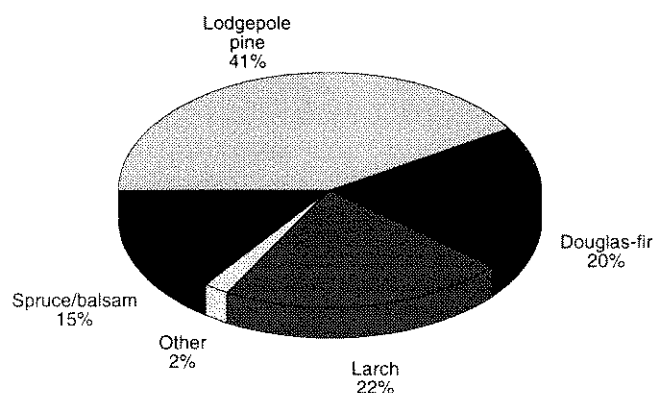


Figure 3 Area of dominant tree species in the timber management land base

The Boundary Timber Supply Area has a relatively balanced representation of age classes in its forests (Figure 4). Much of the forest in the 61 to 80 year age class is lodgepole pine which will become susceptible to attack by the mountain pine beetle, possibly creating catastrophic timber losses.

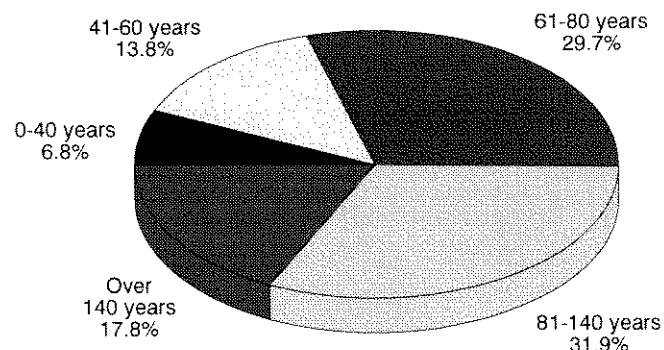


Figure 4 Forest ages within the timber management land base

Timber is considered the primary economic resource of the forests within the Boundary Timber Supply Area and is the basis of the most important industrial sector. However, the forests contain other resources. They provide habitat for a wide variety of wildlife species, including grizzly bears. Forests and grassland areas provide range lands for cattle. Water from sources within the forest land base is important for wildlife and fisheries habitats, domestic use and agricultural irrigation.

Recreational values are also high. Hiking, mountain-biking, hunting, fishing, boating, back-country recreation and wildlife viewing are all common recreational activities. In the winter, snowmobiling, cross-country skiing and downhill skiing are popular. Important transportation corridors and popular lakes such as Jewel and Christina are highly valued for their scenic values.

The Boundary area has a history of mining and exploration continues in hopes of finding new mining opportunities.

Current allowable annual cut and historical harvest levels

In 1987 the allowable annual cut for the Boundary Timber Supply Area was set at 700,000 cubic metres per year. Approximately 74 per cent of this allowable annual cut is allocated to major long-term licences, 23.5 per cent is harvested by the Small Business Forest Enterprise Program administered by the Forest Service, 1.5 per cent is harvested by woodlot holders and one per cent is unallocated.

Management of the mountain pine beetle in the Boundary Timber Supply Area has prompted recent, temporary changes in the allowable annual cut. The mountain pine beetle has damaged lodgepole pine forests in the Boundary Timber Supply Areas at an increasing rate over the last 15 years. Beetle killed timber deteriorates rapidly, resulting in substantial

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losses in timber quality and merchantable volumes if it is not harvested in the short term.

Surveys completed in 1991 indicated beetle populations had increased in certain areas and substantial losses in timber values were predicted. To allow prompt salvage of this damaged timber, and harvesting of timber blown over in a windstorm in 1991, the chief forester, in September 1992, approved an increase in the allowable annual cut for the Boundary Timber Supply Area to 900,000 cubic metres per year for 1993 to 1995. The allowable annual cut for Tree Farm License 8, which is within the Boundary Forest District (see map on cover), was also increased for 1992 to 1994. These increases were only to be implemented if required to harvest priority beetle salvage and blowdown areas.

The increased allowable annual cut was implemented in 1993. In late 1993, surveys indicated a dramatic decline in the beetle population, probably due to the very cool, moist summers and years of aggressive and pro-active management of the beetle problem. It was decided that the increased harvest level was not required in 1994, the standard allowable annual cut was sufficient to harvest existing areas where beetle populations were a problem. The temporary increase in the allowable annual cut has not been cancelled for the timber supply area. It remains in effect until the end of 1995 and may be implemented if there is a significant increase in the beetle population. The increased allowable annual cut for the tree farm licence has recently been cancelled.

Socio-economic profile

The Boundary area is sparsely populated and has historically been dependent on forestry, mining and agriculture. In recent years some diversification of the local economy has occurred with the development of a growing service sector and increased tourism. The mild climate, attractive living environment and available services have also attracted many retirees to settle in the Boundary area, which has boosted the economy.

However, the area remains highly dependent on forestry and forestry-related manufacturing for employment and income. Three of the largest four employers in the area are involved in forestry-related manufacturing. As figure 5 indicates, forestry accounts for 35 per cent of the basic income in the area (SEA page 20). The agricultural and mining sectors continue to be significant. The main agricultural enterprise is cattle production, with beef herds utilizing Crown range land and locally produced forage. No major producing mines remain in the area. However, as the area is richly mineralized, exploration continues and has increased recently due to higher metal prices.

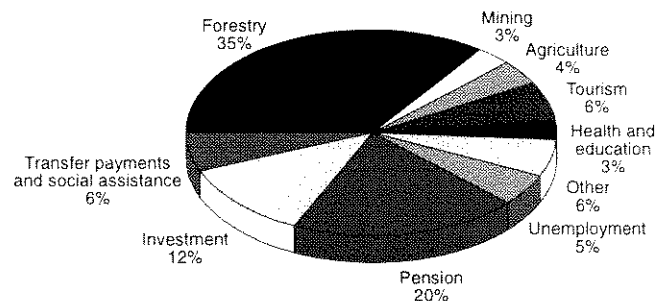


Figure 5 Regional income sources by sector

Approximately 72 per cent of the timber harvested in the timber supply area is processed at two sawmills operated by one company at Grand Forks and Midway (SEA page 41). Dimensional lumber is the primary product, but wood chips are sold to a pulpmill in Castlegar (outside the timber supply area) and a large proportion of the milling residues are sold to a particleboard plant in Grand Forks. Several smaller mills within the timber supply area also produce lumber. In recent years there has been considerable competition from Okanagan mills for timber harvested from this timber supply area.

It is estimated that approximately 1,000 direct jobs in the area can be attributed to the forest industry (SEA page 22), of which 558 result from harvesting in the Boundary Timber Supply Area (SEA page 48). The remainder are generated by timber harvested from Tree Farm License 8, private land and from land outside the area.

It is estimated that 518 person-years of direct forestry employment are created in the local area by the harvesting and processing of timber from the Boundary Timber Supply Area. An additional 210 person-years of employment are created through the spending of forest companies and their employees in the area.

The status of the temporary harvest increase to salvage beetle damaged timber has generated local concerns and media coverage. In May 1994, the forest company which operates the mill in Grand Forks announced they would reduce mill production to one shift as of January 1995, because of the loss of the temporary increase in the harvest level. A socio-economic impact assessment completed by a consultant on behalf of the Regional District of Kootenay Boundary estimated that over 100 jobs in the sawmill could be lost. Additional jobs in harvesting related activities are also predicted to be lost. The report also noted that the overall impact on the community is not expected to be severe provided the current population and job trends continue.

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Provincial economy and revenues

On a provincial basis, it is estimated that a total of approximately 1575 person-years of direct and indirect employment are created at the provincial level, including the employment within the timber supply area, from timber harvested within the Boundary Timber Supply Area. This employment is estimated to generate \$47.6 million in annual employment income. (SEA page 58)

Based on the allowable annual cut of 700,000 cubic metres, it is estimated that forestry within the Boundary Timber Supply Area generates approximately \$16.0 million in provincial revenue and \$12.3 million in federal revenue annually. Stumpage accounts for \$6.2 million of provincial revenues (SEA pages 61-62). 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 on a provincial basis stumpage rates are expected to increase by as much as 80 per cent, it will not be possible to accurately estimate the impact of this change until the new policy has been in place for a period of time.

Current management practices

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

The information for the timber supply analysis was based on land-use designations and management practices that were being implemented in the Boundary Timber Supply Area in the fall of 1993 when this analysis was initiated. These practices are described below. Readers are encouraged to read Section 2 and Appendix A of the *Timber Supply Analysis Report* or the data package for more information.

Some of these practices have changed since the fall of 1993, particularly practices to protect biodiversity, old-growth forests, wildlife species such as grizzly bears, and water resources. These changes and their impact on timber supply are discussed in the section on Critical Factors.

Management zones

To assess the timber supply impacts of current practices the timber management land base was divided into five management zones based on integrated resource management objectives (TSAR page 12). Forest management practices are defined for each zone based on the management objectives. Where an area fell into more than one zone, the overlap area was assigned to the most restrictive zone. The area of the timber management land base in each zone is shown in figure 6.

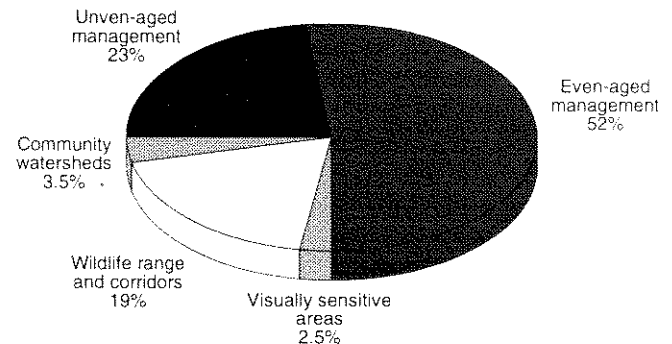


Figure 6 Area in each management zone

- **Uneven-aged management zone** (71,472 hectares) - Includes Douglas-fir, larch and ponderosa pine forests where integrated resource management is accomplished using selection silvicultural systems with partial cutting harvesting methods.
- **Wildlife winter range and corridors** (59,278 hectares) - Includes low elevation areas that provide shelter for deer and other wildlife species during the winter and wildlife corridors that have been established in some parts of the timber supply area to provide forested links between lower and upper elevation areas and adjacent watersheds. The management objective in this zone is to maintain the integrity of winter range and wildlife corridors by managing the area to create older forests (up to 170 years old).
- **Community watersheds** (10,819 hectares) - Includes all designated community watersheds. Where the guidelines developed for the Italy Sutherland Watershed Plan are implemented. Harvesting within this zone will generally be less frequent than in other zones. A maximum of 20 per cent of the area within a specific watershed is permitted to have timber below five metres tall at any time. Also, 10 per cent of the area must be maintained as old-growth forests at least 150 years old.

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- **Visually sensitive areas** (7,900 hectares) - Includes areas that can be seen from major highway corridors or from Christina and Jewel Lakes. The management objective is to maintain the visual quality of the landscape seen from these sensitive areas.
- **Even-aged management zone** (161,852 hectares) - Includes the timber management land base not assigned to another zone. The objective is to manage these areas on an integrated resource management basis using silvicultural systems for even-aged forests.
- **Harvest ages** - 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 range from 60 to 120 years based on site productivity and current management practices. Due to the mountain pine beetle, pine stands as young as 60 years are currently being harvested.
- **Harvest priority**- Until 1993, up to 80 per cent of the allowable annual cut was harvested from lodgepole pine forests that were susceptible to the mountain pine beetle. Because beetle populations have declined, currently only 50 per cent of the allowable annual cut is from pine stands at risk of beetle attack.

Current practices

The current management practices that are approved and implemented in each zone are briefly described below.

- **Wildlife/biodiversity** - Deciduous trees in mainly coniferous forests and in deciduous forests are excluded from the timber management land base. Live trees and short, dead trees that provide wildlife habitat are left in many areas following harvesting and represent a small annual reduction in available timber.
- **Water management** - To protect water quality and flow levels in all zones outside the community watershed zone, harvesting is limited so that no more than 30 per cent of an area is permitted to be harvested and reforested with trees less than three to five metres tall at any time. The minimum height for acceptably reforested areas varies in each management zone. In areas that have been harvested more than this practice permits due to salvage of mountain pine beetle infested timber, the analysis precluded further harvesting until reforested areas reached the minimum heights.
- **Basic silviculture** - By law, harvested areas that are expected to produce timber in the future must be reforested with ecologically acceptable species within a specified time period. In the Boundary Timber Supply Area reforestation is achieved by a combination of natural regeneration and planting, with regeneration delays of three to seven years. Mixtures of lodgepole pine and other species are being encouraged to reduce the risk of mountain pine beetle outbreaks. Areas reforested since 1984 are assumed to be managed forests with faster timber growth rates than unmanaged forests.
- **Timber utilization** - Within cutblocks, timber that meets or exceeds the following size limits and is suitable for manufacturing lumber is considered merchantable and must be utilized:
 - logs from trees must be at least 50 per cent usable
 - tree diameters at chest height must be 12.5 centimetres for lodgepole pine and 17.5 centimetres for other species
 - top diameter of cut logs is 10 centimetres
- **Soil conservation** - Road building and harvesting layout follow provincial guidelines. It is estimated that 3,300 hectares (less than one per cent of the productive forest land base) is occupied by roads, skid trails and landings which are considered non-productive and which have been deducted from the timber management land base. Over the long term, construction of roads, skid trails and landings is expected to reduce the timber management land base by about 12,300 hectares or approximately three per cent. Actual losses may be higher than estimated depending on the harvesting methods used.
- **Unsalvaged losses** - Forest losses due to wildfire, insects, diseases and blowdown are minimized as much as possible. Current management practices are estimated to maintain unsalvaged losses to an average of 50,400 cubic metres per year from the following sources:
 - wildfire - 3,500 cubic metres
 - blowdown - 5,000 cubic metres
 - insects - 5,800 cubic metres
 - wildlife habitat and seed trees - 6,100 cubic metres
 - root rots - 30,000 cubic metres

Estimating losses for root rot is especially difficult. Actual future losses may be higher or lower than estimated.

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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 the timber supply analysis for this review, the analyst attempts to generate a base case timber supply forecast that meets all of the following conditions:

- the current allowable annual cut is maintained for as long as possible, or if this is not possible, the maximum initial harvest level is found, then
- the timber supply is reduced within a defined range, usually eight to 12 per cent per decade, until the long-term timber supply level is reached, and
- the projected timber supply is maintained at or above the predicted long-term level at all times

For the Boundary Timber Supply Area it was difficult to accurately depict some management practices in the analysis. However, the available information and the analytical techniques used provide the best analysis that is available at this time.

Figure 7 illustrates the impact of maintaining the allowable annual cut at the elevated harvest level of 900,000 cubic metres per year that was established to salvage timber damaged by the mountain pine beetle. While the analysis predicts that it is possible to maintain the harvest at this level for the first 30 years, this leads to drastic timber supply shortages in the future.

Based on current management practices, the existing land base and the best information that was available in 1993, the base case forecast predicts the current allowable annual cut of 700,000 cubic metres per year may be maintained for 80 years. This is followed by a decline in timber supply over a 20-year period to the long-term sustainable level of 560,000 cubic metres per year. (Figure 7)

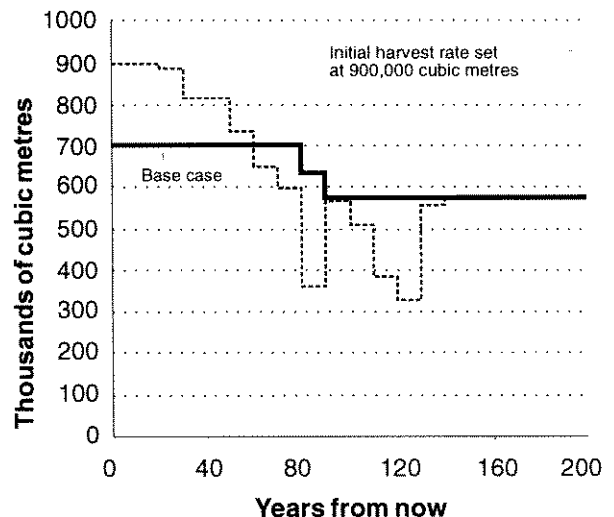


Figure 7 Base case and elevated timber supply forecast

Examining critical factors

Since 1993 when the data was prepared for the timber supply analysis, Forest Service and Ministry of Environment, Lands and Parks staff have been collecting more information for some of the factors in the analysis. Also, tests completed during the timber supply analysis identified which factors had the greatest effect on the timber supply forecasts, particularly in the next 20 years. These critical factors are discussed in this section. Other factors in the analysis were tested and are discussed in the timber supply review report (TSAR pages 25-51) 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 when assessing the allowable annual cut and identifying where improved information is needed. We encourage you to do the same.

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

- **Increased green-up requirements**
Based on management practices that were being implemented in 1993 to protect water quality, forested areas adjacent to harvested cutovers were not considered available for harvesting in the timber supply analysis until the new forests on the cutover areas had grown to be three to five metres tall. This was expected to take 20 to 25 years in the timber supply analysis. The minimum height (green-up requirement) was based on the management objectives in each management zone.

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Since 1993, management guidelines have changed and indications are that green-up in many areas may not be achieved until trees reach nine metres in height. This is a significant change that warrants careful consideration in the allowable annual cut determination.

The impact of increasing the green-up requirements to minimum heights that were estimated to take 30 to 38 years to achieve is shown in figure 8 (TSAR page 31). This test indicates the current allowable annual cut can only be maintained for 10 years before it starts declining to a long-term level of 510,000 cubic metres.

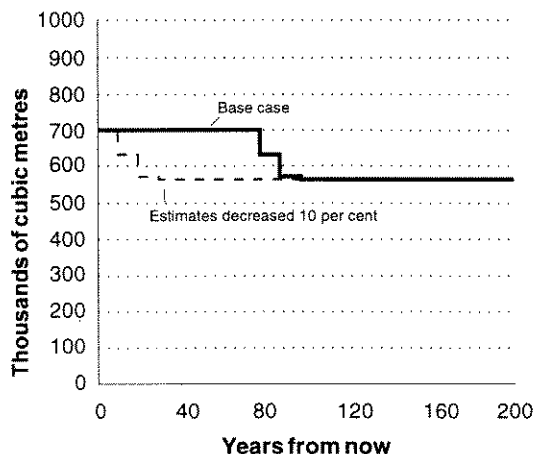


Figure 8 Impacts of changing the green-up requirements

- **Increased forest cover requirements**

The timber supply in the Boundary Timber Supply Area also depends on forest cover requirements—the amount of forest in a geographic area that can be harvested and reforested with trees below a specified height at any time. The impacts of changing the forest cover requirements are shown in figure 9.

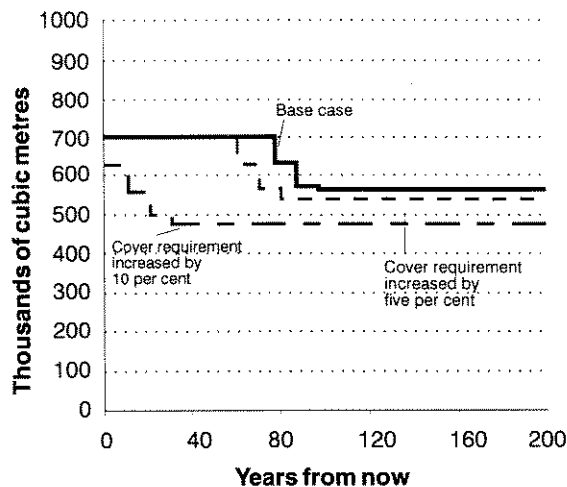


Figure 9 Impacts of changing forest cover requirements

Recent changes in integrated resource management practices and the effects of previous harvesting patterns may necessitate higher forest cover requirements than were defined in the base case analysis and this may restrict the amount of timber available for harvesting. The recent report from the Commission on Resources and Environment also includes recommendations for increased forest cover requirements. Forest District staff expect forest cover requirements to change.

- **New wildlife management practices**

The following practices are being implemented in the Boundary Timber Supply Area to improve management of wildlife species. As these were not current practices in 1993, they were not included in the timber supply analysis. It is expected these practices will impact the timber supply.

- **increased deer winter range requirements**

The area of deer winter range has been redefined by Ministry of Environment, Lands and Parks staff. Forest Service staff are of the opinion that the new requirements for managing deer winter range may be more restrictive to timber harvesting than indicated in the base case.

- **grizzly bear habitat**

Ministry of Environment, Lands and Parks has also identified a large area of grizzly bear habitat including the Upper Kettle, Granby/Burrell and areas north of Christina Lake which are of concern to them. Special management requirements are being developed by Ministry of Environment, Lands and Parks.

- **old-growth forests**

New biodiversity guidelines may require 12 per cent of each ecological type to be maintained in old-growth forests greater than 140 years old. Recommendations regarding maintenance of old-growth forest characteristics are also included in the recent report from the Commission on Resources and Environment (CORE).

When they are implemented, these requirements will restrict the availability of mature timber in the Boundary Timber Supply Area. The impact of this requirement was tested in the timber supply analysis and resulted in a forecast of the current allowable annual cut being maintained for only 40 rather than 80 years as in the base case forecast. The long-term sustainable yield is also reduced to 532,000 cubic metres per year.

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- **forest ecosystem networks**

When the timber supply analysis was completed, existing wildlife corridors were included in a management zone for wildlife winter range and corridors. Since that time, additional networks of forest ecosystems designed to provide travel corridors and habitat for wildlife species have been identified. Although there will likely be some opportunities to harvest timber within these networks, it appears the timber management land base may have to be reduced to ensure these areas are maintained. Ministry of Environment, Lands and Parks staff estimate this may require a reduction of up to eight per cent of the timber management land base.

- **Protection of riparian areas**

In the Boundary Timber Supply Area, current practice in riparian zones restricts the use of machinery along water courses and in streamside buffer strips. Riparian areas are not reserved entirely from harvesting as some of the merchantable timber in these areas can be harvested with these practices. Thus, in the timber supply analysis, a deduction was not made from the timber management land base for the protection of riparian habitats. Also, this would not have been possible as the necessary information was not available.

quantity *-FPC?*
In the future, timber harvesting may not be permitted in some riparian habitats necessitating deduction of these areas from the timber management land base. The timber supply may be reduced if this occurs.

- **Estimates of mature timber**

In the Boundary Timber Supply Area the estimates of merchantable timber in the existing mature forests have a substantial impact on the timber supply forecast. A 10 per cent reduction in these estimates reduces the projected timber supply to 10 years at the current allowable annual cut level rather than 80 years as in the base case forecast. (TSAR page 33)

X
In recent years, harvesting has been concentrated in pine forests where a limited comparison indicates the harvested timber volumes have been reasonably close to the projected volumes used in the timber supply analysis. However, because in adjacent districts lower timber volumes have been removed from similar forests with tree species other than pine, Forest District staff are concerned that the mature timber may be over-estimated, particularly in the older forests.

- **Estimates of timber losses to root rots**

For the timber supply analysis it was estimated that 30,000 cubic metres of timber are lost annually to root rots. As there is considerable debate on the impacts of root rots, this estimate is based on the current understanding of decay rates and the impact of root rots on forest growth, and the potential for reducing these losses through forest management practices. It is possible further studies will indicate these losses are higher or lower than estimated.

- **Combined impacts**

Each of the critical factors explained above may negatively impact the timber supply. Boundary Forest District staff believe the risk of these factors occurring together is high. In some cases the impacts of those factors may be compounded. In other cases the impacts may overlap. The relationship of these factors will be considered in the allowable annual cut determination.

Possible opportunities to partially offset timber supply reductions

- **Increasing the timber management land base**

One of the first steps in a timber supply analysis is to define the area within the timber management land base. In the Boundary Timber Supply Review environmentally sensitive areas, areas with special recreational or other values, forest types that currently are not considered merchantable and areas where timber harvesting is currently not feasible were deducted from the timber management land base.

It has been suggested by the forest industry that if timber values increase or the economics of using different harvesting systems improve, more of the forested area within the timber supply area could be suitable for harvesting. If this should happen, it could lead to an increase in the timber supply.

The following areas may provide opportunities for increasing the timber management land base:

- areas that are not economically feasible to harvest using current harvest methods (44,622 hectares)

Note: Approximately 45 per cent of this area is located within areas that were recommended for protection in the recent report from the Commission on Resources and Environment.

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- forests that currently are not merchantable including those with very dense, small diameter lodgepole pine, very old cedar and hemlock that is highly decayed or relatively short, and spruce and balsam that is growing very slowly at high elevations (14,151 hectares)
- **Increasing the growth rate of regenerated forests**
Few regenerated stands have grown to maturity in the Interior of British Columbia, making it difficult to estimate the amount of merchantable wood we can expect to harvest from these forests. There are opinions that, with planting and stand tending practices such as juvenile spacing and fertilization, the growth rate of these regenerated areas will be higher than the estimates used in the base case analysis. This could result in an increase in the short- and long-term timber supply.

However, a test of the impacts of a 20 per cent increase in the growth rate of regenerated forests in the Boundary Timber Supply Area did not show this result. The long-term timber supply did increase, but the short-term supply was unchanged.

- **Commercial thinning**
Although approximately 14 per cent of forests in the timber management land base are between 41 and 60 years old, and may be candidates for commercial thinning. To date hardly any commercial thinning has occurred in the Boundary Timber Supply Area.

Lodgepole pine forests are possibly the best candidates for commercial thinning because they have a tendency to become overly dense, resulting in slow height growth and reduced merchantability. Commercial thinning to remove some of the trees in these forests before height growth is delayed may ensure more of these forests are economical to harvest in the long term.

Commercial thinning also has other benefits such as maintaining forest cover, increasing available timber during periods of shortages, improving forest health and also providing an option for removing timber volume where clearcutting is not acceptable.

Further study is required to examine the feasibility of implementing commercial thinning in candidate forests in the Boundary Timber Supply Area, and to assess the impact on the projected short- and long-term timber supply.

- **Improved utilization**
Over the last five years, an average of 63,000 cubic metres per year of relatively poor quality, small timber that does not meet the current timber utilization standards has been removed from

cutover areas. Much of this wood is recovered while beetle damaged forests are harvested. Because this timber has not been included in the merchantable volumes used to determine the present allowable annual cut, it has been harvested in addition to the allowable annual cut.

Much of this wood has been manufactured by the major sawmills; some is traded to small manufacturers for use as fence posts, building logs and to produce small dimension lumber. In addition, one small mill in the area has been seeking opportunities to obtain cutting rights for small diameter timber below the current utilization standards.

Recovering timber that does not meet the current utilization standards may provide an opportunity to increase the timber supply in both the short- and long-term. However, an analysis of the effects of this approach on the timber supply and the biological effects of removing this amount of wood from the forest is necessary before this approach can be widely implemented.

Environmental and socio-economic impacts

Environmental concerns

Ministry of Environment, Lands and Parks staff support many of the current management practices used in the Boundary Timber Supply Area to protect watersheds and wildlife habitat. However, they are concerned about some of the information used in the timber supply analysis, and the potential impacts of some current practices on water, wildlife and biodiversity as outlined below: (SEA page 73)

- Watershed assessment and management guidelines, including forest cover and green-up requirements, are presently being refined. A number of changes are likely in the near future which appear to be more restrictive on timber harvesting than those used in the timber supply analysis.
- The current analysis does not fully account for a number of practices that are important for maintaining wildlife habitats and populations such as provision of young and old-growth forests, establishing networks of important and diverse forest ecosystems, maintaining coarse woody debris on cutover sites, and protection of riparian areas. Many of these practices will be required in the new Forest Practices Code and may have both short- and long-term effects on the timber supply.

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- The impact of both the rate and distribution of harvest on the grizzly bear population in the area is not well understood (SEA page 10). There are concerns that harvesting may affect grizzly bear forage and that roads established for harvesting could lead to more human-bear encounters which are likely to be detrimental to the bear population. Plans are in place to study grizzly bear travel and habitat use patterns to refine the information on this issue.

Community impacts

Assessing the impacts of changes in the allowable annual cut in Boundary communities is complicated by the current adjustment to the end of the beetle salvage and changes in employment due to the modernization of the local mills. Jobs are expected to be lost in the near future. A recent study determined that while this job loss was significant, the overall impact on the community is not expected to be severe provided current population and job growth trends in the area continue.

The base case harvest forecast indicates job stability and employment may be maintained for 80 years, provided the use of labor in harvesting and processing timber remains constant (SEA page 55). This stability would be desirable because of the relatively high community dependence on forestry, and the anticipated job losses associated with end of the elevated harvest level. Beyond 80 years it is difficult to predict the potential social impacts that may result from changes in the allowable annual cut.

In the *Socio-Economic Analysis* it was assumed that a change in timber supply would create economic impacts that are directly related to the size of the timber supply reduction or increase. For the purposes of illustration, it was predicted that if the allowable annual cut were reduced by 15 per cent, 78 person-years of direct employment would be lost. (SEA page 65). The loss of these jobs in addition to the current employment adjustment could overtax the existing social services in the area.

Since timber processing is concentrated at two mills owned by one company, any reduction of timber supply has a greater potential impact than if a diversity of mills existed in the area. If other sources of timber cannot be found, resulting changes in milling production may have major repercussions in Grand Forks and the Boundary area as a whole. Eventually the company may be forced to reconfigure the older, less efficient Grand Forks mill to manufacture value-added products, or possibly to shut it down, with resulting employment impacts. (SEA page 43)

It is difficult to predict the social impacts related to changes in allowable annual cut. The Boundary community exhibits a number of positive characteristics or trends that may help mitigate negative economic impacts: there is a strong sense of identity and cohesion with a core of residents having long-standing ties to the community. There is also a well-developed base of social services that can assist families in difficult times.

Opportunities for further diversification of the local economy also look promising. In the long term, the local economy may be sufficiently diversified to absorb any future reductions. Within the forest sector, future employment losses may be minimized by encouraging value-added manufacturing, by harvesting stands that are not currently considered merchantable and by employing alternative harvest systems which are more labor intensive. Additional opportunities are expected to be developed through the Forest Renewal Plan. The challenge for the community is to develop a strategy to minimize the impact of the projected long-term timber supply adjustment.

Provincial impacts

Maintaining the current allowable annual cut as in the base case forecast indicates a total of approximately 630 person-years of direct forest sector employment will be generated annually throughout the province, including the timber supply area, over the first 80 years, with \$22.2 million in direct income (SEA page 58). This timber supply level would also support another 945 person-years of indirect and induced employment which generates another \$25.4 million in income. Approximately \$16 million in provincial government revenues would also be generated annually during the first 80 years. As noted earlier, these estimates do not include the impacts of the new Forest Renewal Plan.

Chief forester's determination

The base case timber supply forecast is not the only pattern that can be chosen to reduce the timber supply in the Boundary Timber Supply Area. 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 harvest reduction:

- the allowable annual cut could be maintained for a longer period, with larger reductions in the future
- small reductions could be implemented now, with larger reductions in the future
- a consistent level of reduction could occur throughout the transition period, or,
- large reductions could be made now, with smaller reductions in the future

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Factors to be examined in other planning processes

Land-use designations and forest management practices will change through the implementation of the Forest Practices Code and the Land Use Plan that will follow the recent report from the Commission on Resources and Environment. Where possible the impacts of these initiatives will be included in this review. Where further information is required, the factors will be incorporated in future allowable annual cut determinations.

It is also expected that a Land and Resource Management Plan will be implemented some time after this review is completed. The Land and Resource Management Plan 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 through this planning process.

Your input is needed

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

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

Please mail the completed questions and your comments to the forest district manager at the address below. Your comments will be accepted until March 19, 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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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 Boundary Timber Supply Area. Further information on the critical factors outlined on pages eight to 11 in this paper would be most helpful.

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

Address (optional) _____

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