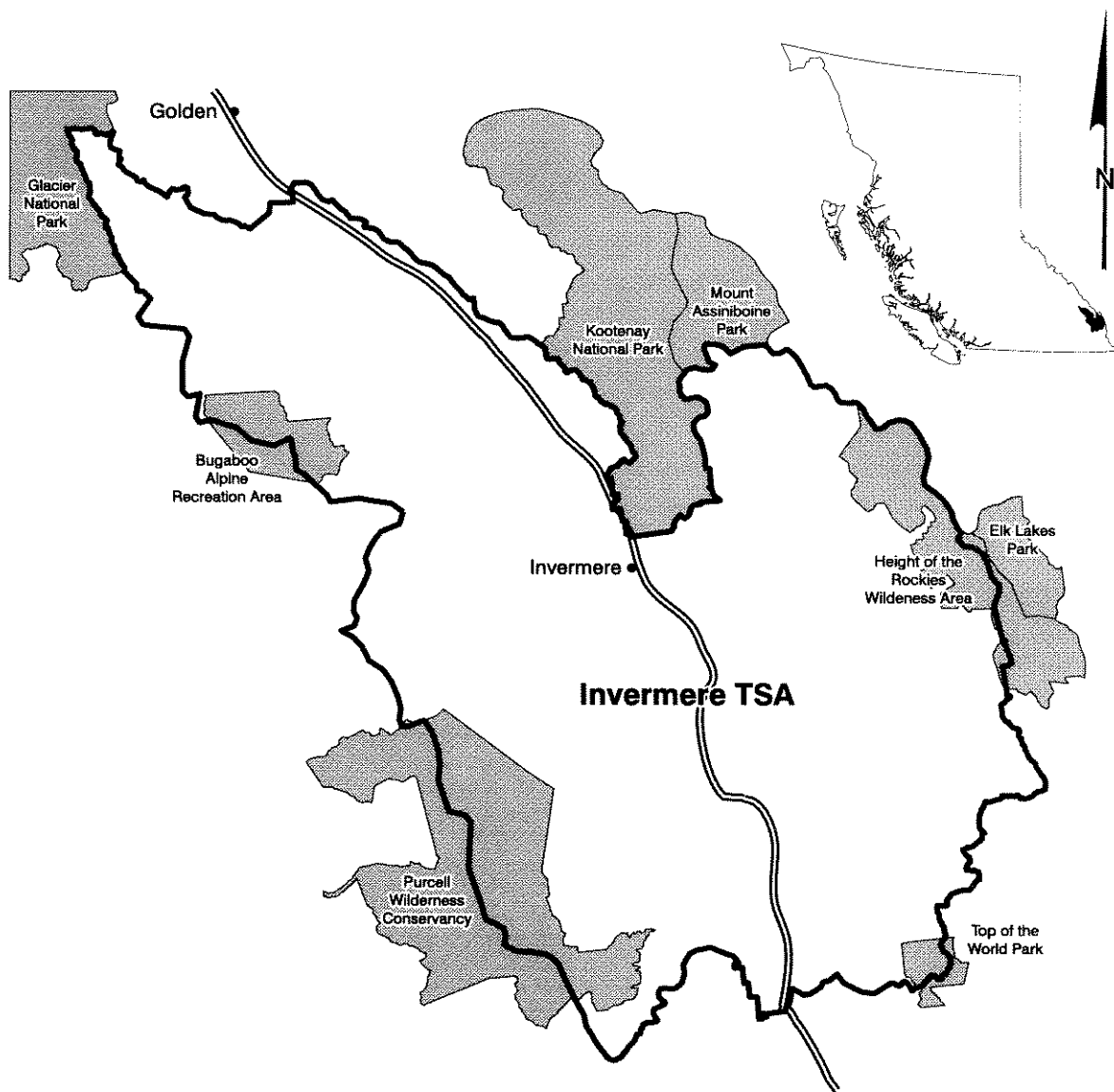




MINISTRY OF FORESTS

Invermere Timber Supply Area

Timber Supply Review Discussion Paper
May 1995



Province of
British Columbia
Ministry
of Forests

Invermere Timber Supply Area

Timber Supply Review Highlights

The Timber Supply Review for the Invermere Timber Supply Area began in May, 1994. The government's East Kootenay Land Use Plan, announced on March 13, 1995, could not be taken into account in this review. It may be possible to assess the timber supply impacts of the Land Use Plan in the Invermere Timber Supply Area before the maximum five year period required by the *Forest Act*.

- The British Columbia Forest Service is reviewing the timber supply in all timber supply areas* and tree farm licence* areas in the province. This review examines the impacts of current forest management practices* on the timber supply*, economy, environment and social conditions of the local area and the province. Based on the results of this review, the chief forester may decide to adjust the allowable annual cut* for the Invermere Timber Supply Area.
- The current allowable annual cut in the Invermere Timber Supply Area was set in 1993 at 657,264 cubic metres per year, including 6,700 cubic metres for woodlots which was not included in this review. This harvest primarily provides timber to large sawmills in Canal Flats and Radium Hot Springs. (page 5)
- Harvesting and processing timber from the Invermere Timber Supply Area supports approximately 553 person-years* of employment in the local area. An additional 878 person-years of employment are created provincially. (page 6)
- The timber supply analysis indicates the current allowable annual cut in the Invermere Timber Supply Area cannot be maintained with current integrated resource management practices without causing severe timber supply shortfalls in the future. The base case timber supply forecast indicates an immediate reduction of approximately 12.7 per cent to 568,000 cubic metres per year is required. This level is projected to be maintained for 10 years followed by a decline of 12 per cent every decade for the following 40 years to 315,000 cubic metres per year (12.5 per cent below the long-term timber supply level). The timber supply is projected to remain at this level for 40 years before rising over 10 years to the long-term sustainable timber supply level of 360,000 cubic metres per year. (page 8)
- The projected timber supply depends a great deal on the number of harvesting entries needed to meet integrated resource management objectives.

Increasing the number of harvesting entries may cause a further reduction in the immediate timber supply. (page 9)

- Changes in the estimates for the following factors may either increase or decrease the projected timber supply:
 - estimates of mature timber in the existing forests
 - size of the timber harvesting land base
 - integrated resource management practices, particularly in the wildlife winter habitat zone and the community watershed zone
 - unsalvageable timber losses
 - minimum harvestable ages (page 10)
- Potential opportunities to partially offset the projected timber supply reduction include:
 - improved timber recovery from harvested areas
 - minimizing timber productivity losses due to roads, trails and landings
 - intensive silvicultural treatments
 - commercial thinning (page 13)
- The implications of adjustments in the timber supply on communities in the area is an important consideration in this review. The impact of projected forestry employment losses will depend on the alternative economic strategies that are developed. (page 13)
- The chief forester must determine an allowable annual cut as part of a strategy to achieve the projected long-term timber supply level. The base case timber supply forecast provides one alternative but the chief forester may select a different harvest level based on his consideration of the factors included in Section 7 of the *Forest Act* which are listed on page 1 and 2 of this paper.

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

Columbia River Treaty

Downstream Benefits Agreement

In return for building three dams, British Columbia will receive financial benefits in exchange for the increase in power potential resulting from improved stream flows in the United States.

Commission on Resources and Environment (CORE)

An independent commission established to develop regional land use recommendations in consultation with stakeholders.

Current forest management practices

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

Environmentally sensitive areas

Areas mapped in the forest inventory as land requiring special management attention to protect important recreation and scenic values, fish and wildlife resources, sensitive soils and unstable slopes.

Forest licence

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

Forest Practices Code

A law which requires better forest practices, with heavy penalties for violators. 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 specific 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.

East Kootenay Land Use Plan

A government decision on land use in the East Kootenay area that has been developed in consultation with stakeholders, taking into consideration the recommendations of the Commission on Resources and Environment (CORE).

Land and Resource Management Plan

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

Person-year

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 land adjacent to the normal high water line of a stream, river, lake or wetland including the portion of land influenced by the presence of the adjacent ponded or channeled water.

Timber harvesting land base

Crown forest land within the timber supply area that is currently considered environmentally and economically feasible 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 defined area of Crown land in accordance with the *Forest Act*.

Visual quality objective

Defines an acceptable level of landscape alteration resulting from timber harvesting or other activities.

Invermere Timber Supply Area

Introduction

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

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

This discussion paper summarizes the technical reports for the Invermere Timber Supply Area and encourages British Columbians to comment on the findings. Public comments will be accepted until August 3, 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
- 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. In total, approximately \$400 million in increased timber fees paid by forest companies will be reinvested each year in forest renewal projects.
- 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 the Commission on Resources and Environment and dedicated British Columbians, long-standing land-use debates are being resolved. The government has delivered land-use plans for Vancouver Island, the Cariboo-Chilcotin and the East Kootenay which mark important steps towards securing British Columbia's future.

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

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

Timber Supply Review process

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

Figure 1 illustrates the five-step process that has been developed for the Timber Supply Review in timber supply areas. The diagram also indicates the status of the Timber Supply Review for the Invermere 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 has been designed to reflect the management role of these licensees. In the past, tree farm licences have not included specified timelines for licensees to prepare the information needed by the chief forester to determine allowable annual cuts for these areas. To reflect changing forest management standards, replacement tree farm licences specify timelines for preparing information.

A commitment to incorporate change

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

Forest Practices Code

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

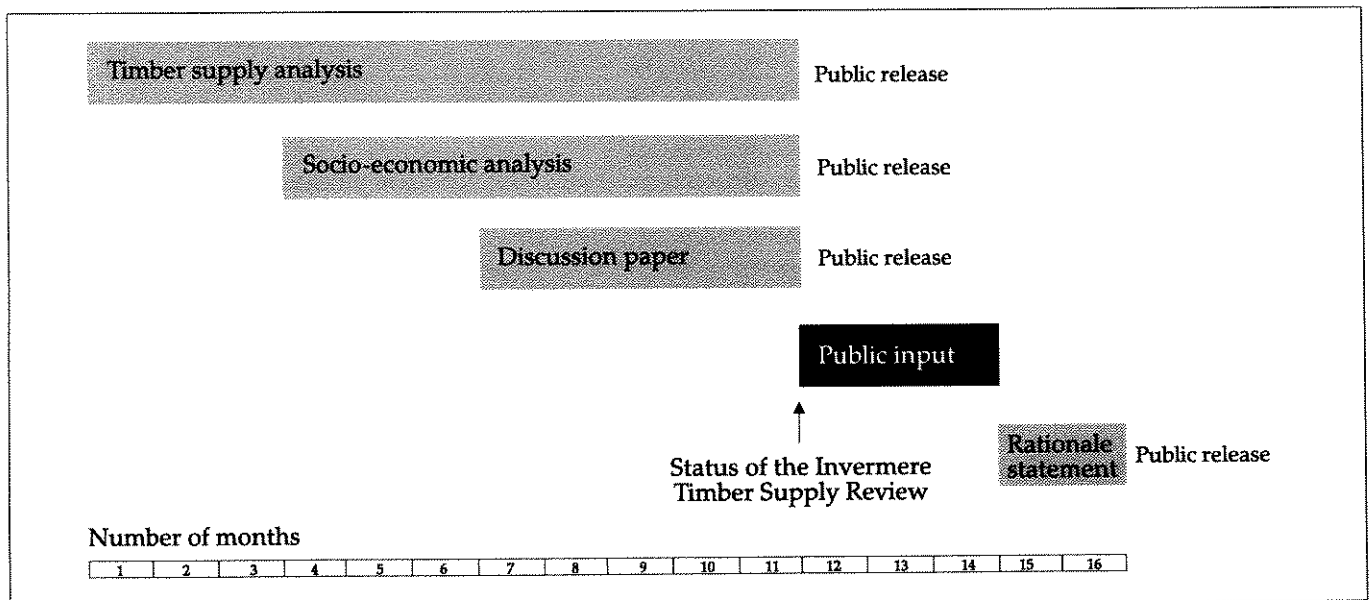


Figure 1 Steps in the Timber Supply Review process

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requires better forest practices throughout the province and establishes heavy penalties for violators. When the Code is fully implemented, forest management practices will 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 Invermere Timber Supply Area based on current understanding of the intentions of the Code. Information about these practices will be provided to the chief forester for consideration in this allowable annual cut determination. In most cases, however, further implementation and experience with the Code will be required before the timber supply effects of new practices can be properly assessed, making it necessary to incorporate these factors in future allowable annual cut determinations.

East Kootenay Land Use Plan

On March 13, 1995, the government of British Columbia announced a Land Use Plan for the East Kootenay region which includes the Invermere Timber Supply Area. This Land Use Plan increased the Protected Areas where commercial timber harvesting will not be permitted to 16.5 per cent of the East Kootenay region. Sustainable resource development was designated for 74 per cent of the area within the following zones:

- Integrated Resource Management Zone (55 per cent)
- Enhanced Resource Development Zone (7.7 per cent)
- Special Resource Management Zone (11.3 per cent)

Broad management objectives that cover all three resource zones include:

- sustainable timber harvesting and related forestry, mineral and other sub-surface resource exploration and development, and sustainable cattle grazing will proceed
- tourism, recreation (motorized and non-motorized), guide-outfitting, trapping, hunting, fishing and agro-forestry will proceed
- government regulations and standards—including British Columbia's Forest Practices Code—apply to all resource activities in the zones
- resource development, and the sites on which it occurs, will be locally guided in a manner which respects sensitive values

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

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

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

In any case, it may be possible to assess the timber supply impacts in the Invermere Timber Supply Area before the maximum five year period required by the *Forest Act*.

Timber Supply Review in the Invermere Timber Supply Area

Forest Service and Ministry of Environment, Lands and Parks staff in the Invermere Forest District prepared the information for the timber supply analysis in July, 1994. This information was provided to local First Nations and major timber companies for comment and is now available for public review at the Invermere Forest District Office. The Forest Service then conducted a short- and long-term timber supply analysis (*Invermere Timber Supply Analysis Report*, May 1995). A socio-economic analysis of the timber supply forecasts was then completed (*Invermere Timber Supply Area: Socio-Economic Analysis*, May 1995). Both reports are available from the Invermere Forest District office and the Nelson Forest Region office.

As the Forest Practices Code and the East Kootenay Land Use Plan did not exist when preparation for the timber supply analysis for the Invermere Timber Supply Area began in May 1994, the *Timber Supply Analysis Report* and the *Socio-Economic Analysis* do NOT include the land use decisions and changes in forest practices resulting from these initiatives.

This discussion paper summarizes the two reports and highlights critical factors the chief forester must consider to determine the allowable annual cut for the Invermere Timber Supply Area. In conjunction with the release of this discussion paper, Forest Service staff will actively solicit public input to ensure the

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information in the Timber Supply Review is correct. Input will be accepted until August 3, 1995, and will be summarized in a report to the chief forester and the minister of forests.

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 *Invermere Timber Supply Analysis Report*, and SEA is the *Invermere Timber Supply Area: Socio-Economic Analysis*)

Description of the Invermere Timber Supply Area

The Invermere Timber Supply Area covers approximately one million hectares in the southeastern portion of British Columbia. The topography is varied, including two rugged mountain ranges (the Rocky Mountains and the Purcell Mountains) separated by a broad, flat valley known as the Rocky Mountain Trench through which the Kootenay river flows south and the Columbia River flows north.

Forest resources

Timber

About 51 per cent of the provincial land in the Invermere Timber Supply Area is either not managed by the British Columbia Forest Service or is not forested (Figure 2). Of the productive forest land managed by the Forest Service, more than half is currently not economical or feasible to harvest and reforest due to environmental sensitivity*, low timber productivity, rough terrain, difficult access, wildlife habitat requirements or non-merchantable timber. Only 23 per cent of the timber supply area is within the timber harvesting land base—the public forest land currently economical and feasible for timber harvesting and reforestation using current methods to meet existing land management objectives. (TSAR page 8)

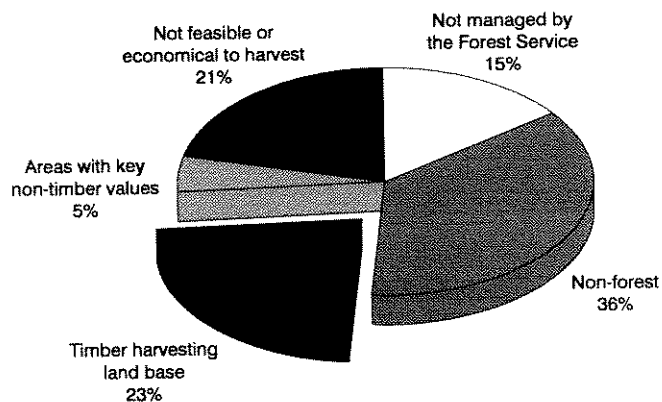


Figure 2 Classification of the land within the Invermere Timber Supply Area

Notes: Total area: 1,018,356 hectares

Study areas under consideration for protected status in the East Kootenay Land Use Plan were included in the timber harvesting land base pending government land use decisions.

Areas with key non-timber values include environmentally sensitive areas, riparian zones and forest ecosystem networks.

Figure 3 illustrates the range of commercial tree species in the forests within the Invermere Timber Supply Area. Lodgepole pine forests over 80 years old cover more than 20 per cent of the timber harvesting land base. These forests are becoming susceptible to the mountain pine beetle which can kill large areas of forests rapidly. (TSAR page 10)

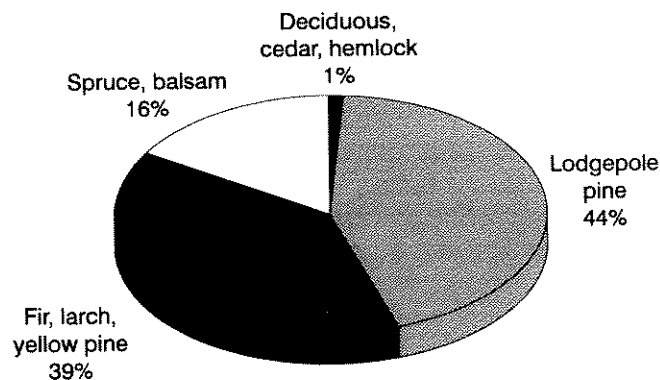


Figure 3 Area occupied by commercial tree species in the timber harvesting land base

Figure 4 illustrates the irregular distribution of forest ages within the timber harvesting land base of the Invermere Timber Supply Area. (TSAR page 11)

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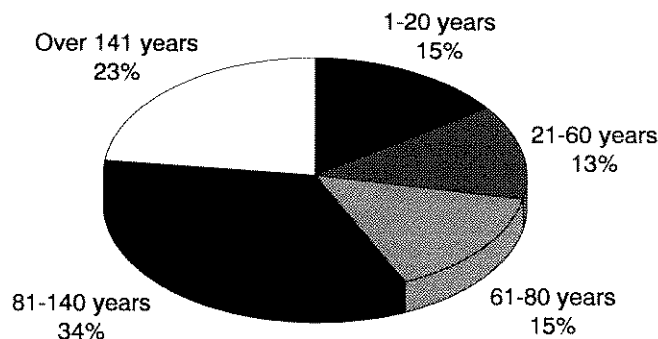


Figure 4 Forest ages within the timber harvesting land base

Wildlife

The Invermere Timber Supply Area is well-known for its wildlife diversity and highly productive wildlife habitat. Some of the highest value wildlife winter range in all of North America is within this timber supply area. Elk, moose, mule and whitetail deer, bighorn sheep, mountain goat, mountain caribou, grizzly bear, black bear, wolverine, cougar, bobcat, lynx, small mammals and rodents, amphibians, reptiles, insects, and many resident and migratory bird species all depend on the wildlife habitats within the timber supply area. This wildlife contributes to the significant biodiversity of the area. (SEA page 14)

Range

An active ranching industry within the timber supply area depends on the extensive public rangelands throughout the area. Potential opportunities exist to rehabilitate rangelands and increase grazing use. (SEA page 39)

Recreation

Recreational values are also extremely high. Sightseeing, camping, fishing, boating, cycling, downhill, cross-country and helicopter skiing, snowmobiling, hiking, mountaineering, caving, mountain biking, canoeing, kayaking and hunting are all popular recreational activities. The diverse wildlife in the area supports public recreational opportunities such as wildlife viewing and a guided hunting industry catering to mainly foreign hunters. Approximately 17 per cent of all hunting in British Columbia occurs in the southeast Kootenay region. (SEA page 34)

Current allowable annual cut

The total allowable annual cut in the Invermere Forest District was set in 1993 at 657,264 cubic metres per year. Approximately 84 per cent of this allowable annual cut is allocated to long-term licences, 12 per

cent is harvested through the Small Business Forest Enterprise Program administered by the Forest Service, two per cent is allocated to woodlot licences and two per cent is unallocated. (SEA page 46)

Because the allowable annual cuts for woodlots are determined separately, the land base for woodlots is not included in the timber harvesting land base for this review. Consequently, the 6,700 cubic metres of allowable annual cut for woodlots was deducted from the cut, creating an allowable annual cut of 650,564 cubic metres for this review.

Socio-economic profile

The total population of the Invermere Timber Supply Area in 1991 was 7,185, with 31 per cent residing in the community of Invermere, 11 per cent in Windermere, 10 per cent in Canal Flats, five per cent in Radium Hot Springs and the remainder in other smaller communities or living rurally. The area is experiencing rapid growth, with migrants attracted by the natural environment and high quality of life offered by the area.

First Nations

The Invermere Timber Supply Area is within the traditional territory of the Ktunaxa/Kinbasket Nation which represents five bands. Approximately 400 members of the Columbia and Shuswap bands live within the timber supply area.

Local economy

The Invermere Timber Supply Area has a growing, diversified economy. As Figure 5 illustrates, tourism, the forest industry and the public sector are the primary sources of employment. (SEA page 29)

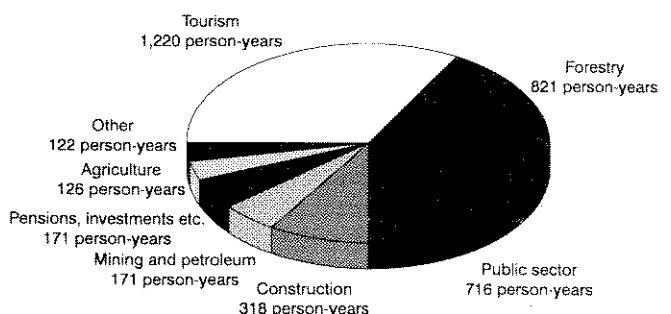


Figure 5 Sources of employment in the Invermere area

While tourism creates the most employment in the area, forestry provides the greatest amount of income: 22 per cent of the total income in the area is created through forestry employment and 16 per cent by tourism.

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Timber industry

Two large firms operate sawmills at Canal Flats and Radium Hot Springs which secure an average of 54 per cent of their timber supply from the Invermere Timber Supply Area. Remaining supplies are secured from a Tree Farm Licence, the Small Business Forest Enterprise Program, private lands, other timber supply areas and forests outside British Columbia. The majority of wood chips are shipped to the pulp mill at Skookumchuk. Four smaller firms operate sawmills and value-added manufacturing operations. (SEA page 48)

Harvesting and processing the current allowable annual cut in the Invermere Timber Supply Area generates an estimated 403 person-years of direct forestry employment within the timber supply area. This direct employment is estimated to generate an additional 150 person-years in spin-off employment in the area. (SEA page 51)

Provincial employment and revenues

On a provincial basis, it is estimated that timber harvested from the Invermere Timber Supply Area generates 1,431 person-years of employment, including 553 person-years within the timber supply area. This employment is estimated to generate \$38.7 million in annual employment income. (SEA page 59)

Harvesting and processing timber from the Invermere Timber Supply Area is estimated to generate approximately \$19.3 million in provincial revenue. These estimates include the increased stumpage revenues being generated to fund the Forest Renewal Plan. (SEA page 61)

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

To facilitate integrated resource management, Total Resource Planning, a consultative decision-making process, has been used since 1989 in the Invermere Forest District. These comprehensive plans provide detailed direction to operational practices. More than 60 per cent of the Invermere Timber Supply area is currently included in approved Total

Resource Plans. Public consultation on these plans occurs through annual open houses and meetings with specific stakeholder and user groups.

The timber supply analysis was based on current management practices in approved Total Resource Plans—practices actually being approved and implemented in the Invermere area in July, 1994, when the timber supply analysis was initiated. Readers are encouraged to review the *Invermere Timber Supply Analysis Report* (Pages 12 to 15 and Appendix A) for more detailed information.

Management zones and integrated resource management practices

For the timber supply analysis, Forest Service staff divided the timber harvesting land base into management zones by grouping areas where similar integrated resource management practices are implemented. This approach permits analysis of the different types of forests and the range of practices in the Invermere 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 generalized practices used in the analysis.

Figure 6 illustrates the area within each of the zones.

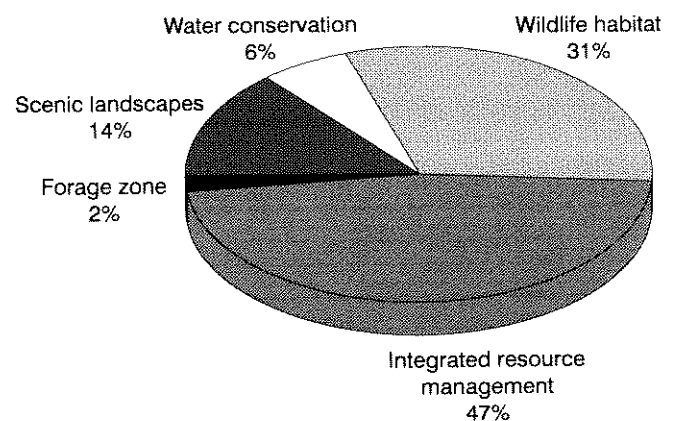


Figure 6 Area within each management zone

The information used in the analysis to describe the integrated resource management practices in each zone are outlined below. An assessment was done to determine if the conditions required to maintain old-growth forests within the timber harvesting land base in each zone were met by areas of old growth that had been deducted from the land base due to environmental sensitivity, steep slopes or other reasons. The assessment indicated old-growth requirements were met in the core caribou habitat zone and the water conservation zone.

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- **Habitat for key wildlife species** — areas managed to provide or maintain critical wildlife habitats:
 - **winter habitat zone** (69,848 hectares) — area critical as winter habitat to wildlife species including deer and elk. No more than 33 per cent of the timber harvesting land base is permitted to have forests less than 15 metres tall at any time. At least six per cent of the land base must have forests at least 141 years old to meet old growth and biodiversity objectives.
 - **core caribou habitat zone** (2,169 hectares) — an area identified by the Ministry of Environment, Lands and Parks that is critical to the health of a particular caribou herd. Current management requires at least 40 per cent of the area in this zone to have forests over 121 years old, and allows a maximum of 40 per cent of the area to have forests less than three metres tall at any time.
- **Scenic landscape zone** — areas where the emphasis is on protecting scenic values. In these areas, studies have shown that forests must be at least six metres tall to meet visual quality objectives.
 - **very visually sensitive/retention visual quality objective** (9,914 hectares) — areas along the Rocky Mountain Trench where changes to the landscape would be conspicuous. A maximum of six per cent of the area within this zone is permitted to have forests less than six metres tall at any time.
 - **moderately visually sensitive/partial retention visual quality objective** (19,963 hectares) — areas along the Rocky Mountain Trench and Toby Creek where changes to the landscape would be less conspicuous but evident. A maximum of 16 per cent of the area within this zone is permitted to have forests less than six metres tall at any time. Four per cent of this zone must be maintained in forests over 141 years old.
 - **less visually sensitive/modification visual quality objective** (3,980 hectares) — areas along the Rocky Mountain Trench and Toby Creek where more changes in the visual landscape are acceptable. A maximum of 33 per cent of the area within this zone is permitted to have forests less than six metres tall at any time. Four per cent of this zone must be maintained in forests over 141 years old.
- **Water conservation zone** (13,519 hectares) — licensed community watersheds identified by the Ministry of Environment, Lands and Parks and other similar areas. To protect water quality, quantity and flow rates, no more than 30 per cent of the area is permitted to have forests less than nine metres tall at any time.
- **Forage zone** (6,450 hectares) — areas in the Rocky Mountain Trench that have been prioritized for forage production in the Trench Integrated Renewable Resource Management Plan and areas of dry-belt Douglas-fir forests that are critical to wildlife species such as deer and elk. In this zone, no more than 50 per cent of the land base is permitted to have forests less than 15 metres tall at any time. A minimum of six per cent of the land base must have forests at least 141 years old.
- **Integrated management zone** (114,366 hectares) — areas not included in the above zones. Current management requirements allow a maximum of 40 per cent of the timber harvesting land base in a specific area to have forests less than three metres tall after the first harvesting entry. Thereafter, no more than 33 per cent of the area is permitted to have forests below this height at any time. After accounting for the amount of older forests outside of the timber harvesting land base in specific areas, between 0 and 11 per cent of the timber harvesting land base is to be maintained in forests at least 141 years old

Current practices

The current forest management practices that were being approved and implemented in each zone when the timber supply analysis was initiated are briefly described below:

- **Basic silviculture** — British Columbia laws require areas that are harvested and expected to produce timber in the future to be reforested with ecologically acceptable species within a specified time frame (four to seven years was used in the analysis). The most common silvicultural practice is to clearcut harvest, allow for natural regeneration and/or plant, then brush and weed if needed.
- **Incremental silviculture** — Juvenile spacing, pruning, and commercial thinning are practised on some of the most productive sites in the Invermere Timber Supply Area.
- **Protection** — Forest losses due to wildfire, insects, diseases and blowdown are minimized as much as possible, and damaged timber is salvaged when feasible. Based on the best available information from the past 10 years, unsalvaged losses are estimated to be 63,597 cubic metres per year from the following sources:
 - diseases (especially root rot) - 26,667 cubic metres
 - insects (especially mountain pine beetle) - 18,050 cubic metres

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- wildfire - 16,470 cubic metres
- other sources (including unsalvaged seed trees) - 2,410 cubic metres
- **Riparian areas** — Current management practices in riparian reserves mapped during the Land Use Planning process essentially preclude harvesting in order to protect water quality, fisheries and wildlife habitats, and biodiversity. Forest Practices Code requirements will soon identify riparian management zones adjacent to riparian reserves where some harvesting will be permitted.
- **Wildlife/biodiversity** — Eight per cent of the timber harvesting land base (18,946 hectares) has been designated for a network of forest ecosystems that connect important wildlife habitat throughout the timber supply area. This area was deducted from the timber harvesting land base for this analysis. During harvesting, current wildlife management practices include leaving a number of dead trees and larger trees, either individually or in clumps, to provide wildlife habitat.
- **Harvestable ages** — Minimum harvestable age is defined as the time it takes for forests to grow to harvestable size. The minimum harvest ages used in the timber supply analysis range from 70 to 160 years based on trees species and ecological information.
- **Soil conservation** — Harvesting layout follows provincial and regional guidelines. For the timber supply analysis, 10.5 per cent of the timber harvesting land base with forests less than 40 years old was deducted for existing roads and landings. To account for future roads and landings, 10.5 per cent of the land base with forests greater than 40 years old is deducted after these forests are harvested.

Timber supply forecasts and critical factors

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

Base case forecast

To complete the timber supply analysis for the Invermere 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 level was lower than the initial harvest level, the timber supply was reduced within a defined range of eight to 12 per cent per decade, until the long-term level is reached
- if possible, maintain the timber supply at or above the predicted long-term sustainable level at all times

If a timber supply forecast could not be generated that met all of these conditions, the analyst adjusted the conditions until a feasible forecast could be produced. Several of these conditions had to be adjusted to create a base case timber supply forecast for the Invermere Timber Supply Area, given the best available information about management practices in place when the analysis was initiated in 1994.

As Figure 7 illustrates, the initial analysis indicated that maintaining the current allowable annual cut would result in a projected decline in timber supply to well below the long-term sustainable level in 60 years. Figure 7 also illustrates a test which confirmed that the reduction below the long-term level could not be avoided. A further test was completed to evaluate the immediate reduction and rate of decline required to achieve the long-term sustainable level. This test is also included in Figure 7. (TSAR pages 29-30)

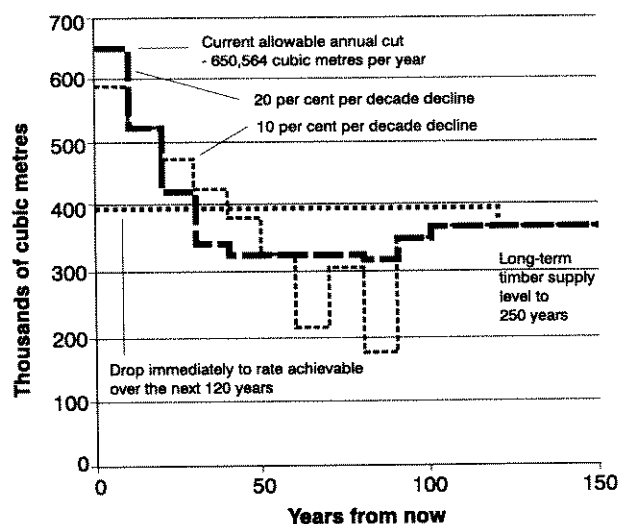


Figure 7 Initial timber supply forecasts

Invermere Timber Supply Area

Based on the information from these initial forecasts, a base case timber supply forecast was developed which balanced the short- and long-term impacts of the required timber supply adjustment (Figure 8). The base case forecast indicates that an immediate reduction of 12.7 per cent (83,564 cubic metres) in the allowable annual cut is required, to 568,000 cubic metres per year. It is possible to maintain this level for 10 years followed by a projected decline of 12 per cent per decade for the next 40 years, to 315,000 cubic metres per year (12.5 per cent below the long-term level). The timber supply is projected to remain at that level for 40 years before rising over 20 years to the long-term level of 360,000 cubic metres per year. (TSAR page 18)

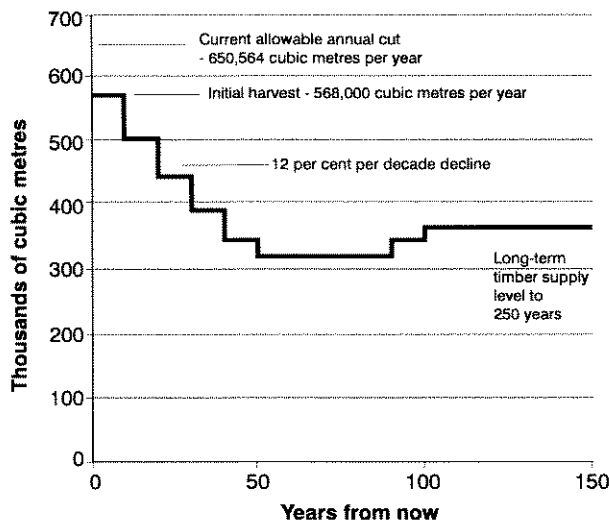


Figure 8 Base case timber supply forecast

This base case forecast is the result of several factors:

- **size of the timber harvesting land base**
The timber harvesting land base in this analysis is smaller than the land base in previous timber supply analyses. This is primarily the result of deductions for the Height of the Rockies Wilderness Area, updated information on steep slopes and other areas that are not feasible or economical to harvest, and the creation of ecosystem networks of older forests and riparian reserves where harvesting is not permitted in order to maintain wildlife habitat and meet biodiversity objectives.
- **management practices included in the analysis**
Since the last analysis, analytical techniques have improved to better incorporate integrated resource management practices. Also, management practices have become more restrictive on timber harvesting in some areas than was estimated in previous analyses. Two situations are particularly important in the Invermere Timber Supply Area:

- **wildlife winter ranges**
Thirty-one per cent of the timber harvesting land base is within wildlife habitat areas where no more than 33 per cent of the land base is permitted to have forests less than 15 metres tall at any time. In comparison, in the integrated resource management zone, trees need only be three metres tall before harvesting in adjacent areas is permitted.
- **scenic landscapes**
Scenic landscapes occupy 14.5 per cent of the timber harvesting land base. In these areas, harvested blocks must have forests at least six metres tall before adjacent mature timber can be harvested. The area within this zone permitted to have forests below six metres tall at any one time depends on the sensitivity of the landscape. On over half of this area, a maximum of 16 per cent is permitted to have forests below the specified height at any time.

Examining critical factors

Since 1994 when the data was prepared for the timber supply analysis, Forest Service staff have been collecting more information for some of the factors in the analysis. Also, tests completed during the timber supply analysis identified which factors had the greatest effect on the timber supply forecasts. These critical factors are discussed in this section. Other factors in the analysis were tested and are discussed in the *Timber Supply Analysis Report* (see pages 31-52) but were not considered as 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 number of harvesting entries**
Currently, operational harvesting plans indicate the mature timber within the integrated resource management area can be harvested in three entries, with 40 per cent of the timber harvested in the first pass. After the harvested areas are reforested and meet the green-up* requirements, 30 per cent of the remaining timber is planned to be removed in each of two future entries.

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It is possible that this harvesting pattern may not continue to be feasible. If the number of harvesting entries must be increased, this will reduce the available timber supply.

Factors that may either increase or decrease the short-term timber supply

- **Estimates of existing mature timber**

As Figure 9 illustrates, the estimates of merchantable timber in the existing mature forests in the timber harvesting land base have a substantial impact on the projected timber supply. (TSAR page 34)

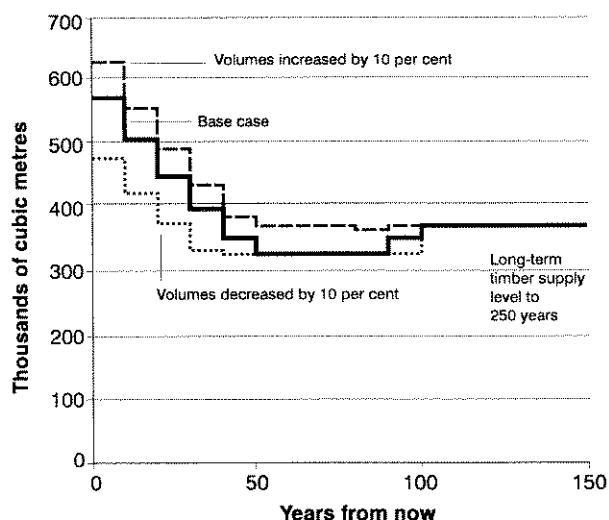


Figure 9 Impact of varying the estimates of mature timber

The forest inventory in the Invermere Timber Supply Area has recently been updated. A preliminary study is underway to examine the consistency between the actual amount of mature timber in selected forests and the amount of mature timber predicted through this inventory.

- **Size of the timber harvesting land base**

The projected timber supply is closely related to the size of the timber harvesting land base. As mentioned earlier, one of the main reasons for the projected immediate reduction in the timber supply is the substantial change in the size of the timber harvesting land base.

Of particular interest is the amount of area required to create networks of ecosystems of older forests throughout the timber supply area which provide wildlife habitat and meet biodiversity objectives. Based on practices in place when the data was developed for the timber supply analysis,

approximately eight per cent of the timber harvesting land base was deducted from the database for these networks. This may under- or over-estimate the actual area required for these networks in the future.

As new technologies become available, and as timber values increase, it is possible some of the areas deducted from the timber harvesting land base for this review may be feasible to harvest and reforest in the future.

However, many of the areas currently excluded from the timber harvesting land base are required to meet non-timber resource management objectives such as forest cover requirements. Harvesting these areas could restrict harvesting in higher value timber lands to meet these objectives. Also, despite advances in technology, it may not be feasible to harvest some of these areas without compromising their environmental values.

The size of the timber harvesting land base will also be affected in the future by the designation of East Purcells Protected Area in the East Kootenay Land Use Plan.

The impacts of changes in the size of the timber harvesting land base are illustrated in Figure 10. It is important to note that increasing the land base by eight per cent does not appear to increase the immediate timber supply because the mature timber that is made available is projected for harvesting 50 to 100 years from now. (TSAR page 37)

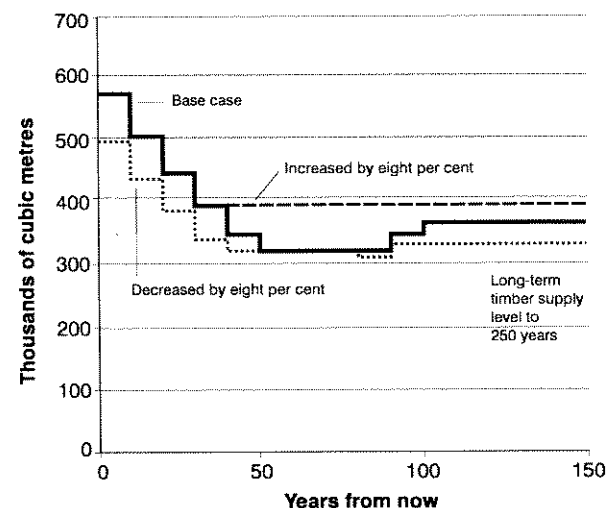


Figure 10 Impacts of changes in the size of the timber harvesting land base

Invermere Timber Supply Area

- Integrated resource management practices**

The timber supply in the Invermere Timber Supply Area depends to a large degree on integrated resource management objectives and the resulting forest cover requirements—the amount of forest within a geographical area that can be harvested and reforested with trees below a specific height or age at any time. Changing either the area permitted to have trees below a specified height or age (cover requirement) or the specified height or age (green-up) impacts the projected timber supply:

- cover requirements**

Figure 11 illustrates the timber supply impacts of changing the amount of area permitted to be below a specified height or age by five per cent throughout the timber supply area. While there are only modest impacts from relaxing this requirement, there are substantial impacts if these requirements are made more restrictive. (TSAR page 41)

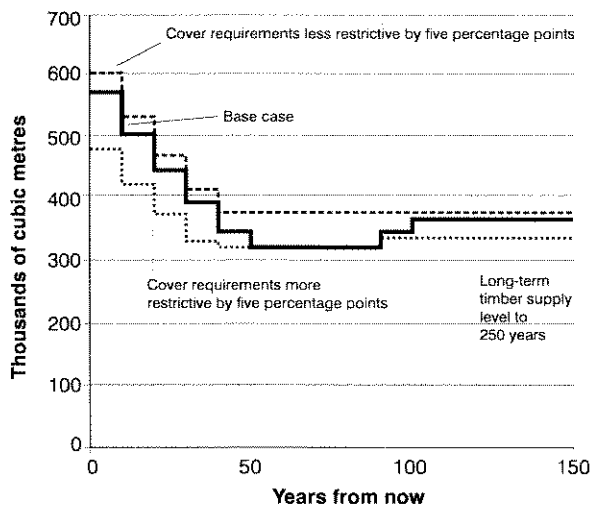


Figure 11 Impacts of changes in estimated cover requirements

As emphasized earlier, the cover requirements in the wildlife winter ranges limit the immediate timber supply. This is illustrated in Figure 12 which shows that slightly more than half of the projected reduction in immediate timber supply results from restrictions on timber harvesting in the wildlife winter range areas, which occupy only 31 per cent of the timber harvesting land base. Changes in cover requirements for visual quality cause most of the rest of the reduction. A test of less restrictive cover requirements (by five percentage points) in the wildlife winter range did not change the immediate timber supply forecast. (TSAR page 41)

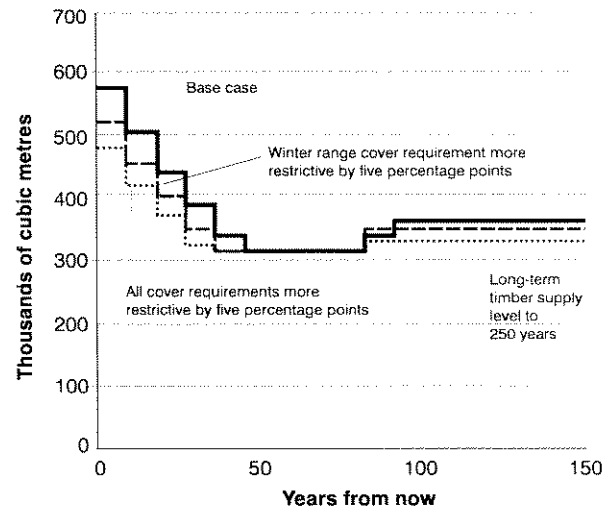


Figure 12 Impacts of winter range cover requirements

- green-up**

Figure 13 illustrates the timber supply impacts of changes in the estimated minimum age for reforested areas to be considered greened-up. (TSAR page 39)

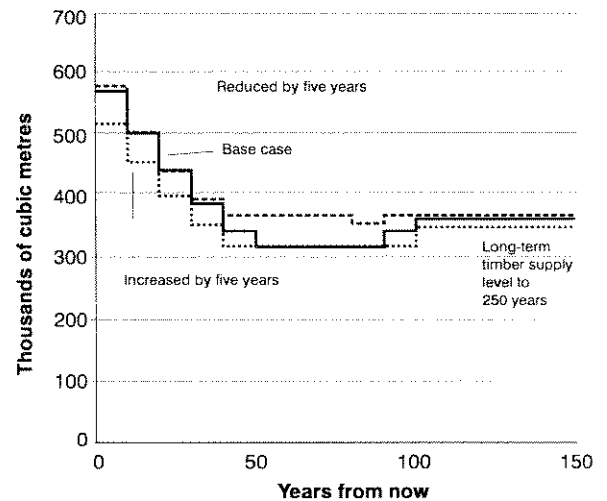


Figure 13 Impacts of changes in estimated green-up periods

Because minimum estimates of the time required to meet the current green-up conditions were used in timber supply analysis, Forest Service District staff are concerned that the green-up periods may have been underestimated, indicating the immediate timber supply may be less than indicated in the base case.

However, the 15 metre green-up requirement applied in the wildlife winter habitat zone and the nine metres used in the community watershed zone may overestimate the forest conditions needed to meet non-timber resource management objectives in these areas. Reducing these requirements would increase the

Invermere Timber Supply Area

immediate timber supply. For example, reducing the green-up requirement in the wildlife winter habitat zone to three metres as in the integrated resource management zone makes it possible to maintain the current allowable annual cut for 10 years and removes the predicted reduction in timber supply below the long-term level. Given the impact of this factor, a thorough examination of the biological requirements in this zone will be needed for the determination.

The effects of previous harvesting patterns and recent changes in integrated resource management practices, particularly to achieve biodiversity objectives, may necessitate more or less restrictive forest cover requirements than were used in the base case forecast. The Land Use Plan is also expected to result in changes in forest cover requirements. This may alter the amount of timber available for harvesting.

- **Estimates of unsalvageable timber losses**

For the timber supply analysis it was estimated, based on information available for the last 10 years, that 63,597 cubic metres of timber are damaged by insects, diseases, wind and other forces and become unsuitable for harvesting each year in the Invermere Timber Supply Area.

Estimating unsalvageable timber losses is difficult in most situations. Several factors complicate this task in the Invermere Timber Supply Area:

- **diseases**

It is difficult to estimate the impact of forest diseases due to the problems in inventorying their existence and assessing the damage they cause. It is also unclear to what extent the timber volume estimates used in the base case forecast already account for these losses as a natural factor in forest development. In the timber supply analysis, 26,667 cubic metres per year were estimated to be lost to diseases, primarily due to root rot.

- **insect epidemics**

Two mountain pine beetle epidemics and a spruce bark beetle epidemic occurred in the Invermere Timber Supply Area in the last 20 years. There are also a number of other insect problems in the area. During the last 10 years it is estimated that 18,050 cubic metres of timber were damaged per year by insects and were not salvaged. Future losses due to insects are highly unpredictable.

- **wildfire and wind damage**

Timber losses to wildfire and wind are also highly variable and unpredictable. An estimate of 18,880 cubic metres per year was used in the timber supply analysis.

Given the uncertainty about the timber supply impacts of forest diseases and the unpredictability of insect epidemics, fire incidence and wind damage, it is possible that future losses could be higher or lower than the estimates used in the base case forecast. Increased salvage of damaged timber might also reduce these estimates. An increase in the estimates of these losses would reduce the projected timber supply by an equal amount; a reduction in losses would increase the projected timber supply.

- **Minimum harvestable ages**

For the timber supply analysis, current practices were used to define minimum harvestable ages at 70 to 160 years depending on species and estimated timber productivity. In all cases, these ages are lower than the age when the maximum timber production occurs.

If the minimum harvestable age was decreased, a minor increase in the timber supply from the base case forecast is forecasted; increasing the minimum harvestable age has a substantial impact on the projected short- and long-term timber supply, as shown in Figure 14. (TSAR page 31)

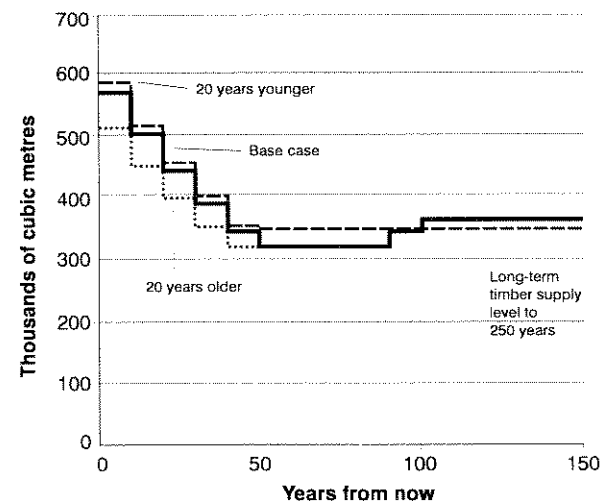


Figure 14 Impact of changes in minimum harvestable ages

Potential opportunities to partially offset projected timber supply reductions

- **Partial cutting practices in wildlife winter ranges**
It may be possible to minimize the timber supply impacts of the forest cover requirements for wildlife winter ranges by expanding partial cutting practices in these areas. Partial cutting is currently practiced in some of this area, however, creative, innovative application of these techniques throughout more of the area may offset the need for the current, relatively restrictive guidelines.

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- **Increased timber recovery from harvested areas**
The forest industry has been experimenting with harvesting and processing smaller pieces of timber than was considered feasible and economical in the past. This practice could increase the volume harvested from existing merchantable forests and encourage harvesting of forests with smaller timber not harvested in the past. The biological effects of removing this additional amount of organic material from these areas must be considered before this practice is widely implemented.

- **Minimizing timber productivity losses to roads, trails and landings**
In the timber supply analysis, it was estimated that 10.5 per cent of the timber harvesting land base will become roads, trails and landings that will not produce timber in the future. It may be possible to change harvesting practices to reduce these timber productivity losses.

- **Intensive silvicultural treatments**
In some circumstances, intensive silvicultural treatments such as juvenile spacing or fertilization which increase tree growth and the long-term timber supply may also increase the short-term timber supply.

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 Invermere 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**
Approximately 23 per cent of the forests in the timber harvesting land base are 40 to 80 years old and may be candidates for commercial thinning. However, to date very little commercial thinning in the Invermere Timber Supply Area has occurred. Commercial thinning has the potential to supply some additional timber in the short-term. Further study is required to identify candidate forests for commercial thinning, to examine the feasibility of a commercial thinning program, and to assess the impact of this practice on the projected short- and long- term timber supply.

Environmental and socio-economic impacts

Environmental concerns

Ministry of Environment, Lands and Parks staff support the integrated resource management practices in the Invermere Timber Supply Area. These practices have been adequately represented in the timber supply analysis.

There are concerns that continuation of current harvesting practices will result in an overall decline in biodiversity over the long-term. The current level of road access also permits extensive exposure of fish and wildlife populations to human contact, which may result in over-exploitation, harassment and displacement of wildlife from preferred habitats. Loss of open grasslands by forest development following aggressive fire suppression may also limit available wildlife habitat. (SEA page 73)

Reduced harvesting levels are more compatible with environmental values in this timber supply area.

First Nations impacts

First Nations are concerned about the effect of timber harvesting on their cultural, medicinal and food values. Reduced harvest levels are more consistent with these values.

Economic opportunities associated with timber harvesting are recognized by First Nations. Higher initial timber supply levels would make it easier for them to acquire harvesting rights and it is expected that declining harvest levels would make this increasingly difficult. (SEA page 69)

Community impacts

The impact of timber supply adjustments on communities in the Invermere Timber Supply Area is an important consideration in this review. In the *Socio-Economic Analysis*, it was assumed that a change in the timber supply would create economic impacts directly related to the size of the reduction or increase in the timber supply (e.g., a 10 per cent reduction in timber supply would result in a 10 per cent decrease in forestry employment).

Based on this assumption, if the chief forester reduced the allowable annual cut to conform to the base case forecast, with its initial 12.7 per cent reduction, it is estimated that a total of 70 person-years of local employment would be lost, including 51 person-years of direct forestry employment (SEA page 58). This is estimated to result in a \$2.0 million reduction in annual employment income.

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Given the current expansion of other sectors in the area, particularly tourism, it is likely that new employment opportunities would offset these losses. However, the new jobs may not be attractive to individuals currently in the forest sector, especially because of the income differences between forestry and tourism employment. (SEA page 30)

Although the larger communities in the Invermere area have broadly-based and stable economies, they are still substantially dependent on the forest sector. The impact of employment losses on these communities will depend on the alternative economic strategies that are developed. New opportunities could be created in areas such as value-added manufacturing, silviculture and forestry planning, as well as through initiatives of the Forest Renewal Plan or the Columbia River Treaty Downstream Benefits Agreement*. (SEA page 67)

Provincial impacts

If the chief forester adjusted the allowable annual cut to conform to the base case forecast, it is estimated that a total of 182 person-years of employment would be lost provincially, including employment within the timber supply area. Annual provincial government revenues are projected to decline by \$2.5 million, if current taxation procedures are maintained. (SEA page 58)

Chief forester's determination

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

Your input is needed

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

Feedback is welcomed on any aspect of this *Discussion Paper*, the *Timber Supply Analysis Report* and the *Socio-economic Analysis Report* and other topics related to the timber supply in the Invermere 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 August 3, 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:

Serg Pereverzoff
District Manager
Invermere Forest District
625 Fourth St.
Invermere, B.C. V0A 1K0

Phone: (604) 342-4200
Fax: (604) 342-4247

Discussion Paper Response Form

- 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

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 Invermere Timber Supply Area.

[illegible]

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 Invermere Timber Supply Area. Further information on the critical factors outlined on pages 9 to 13 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) _____

Serg Pereverzoff
District Manager
Invermere Forest District
625 Fourth St.
Invermere, B.C. V0A 1K0

Phone: (604) 342-4200
Fax: (604) 342-4247

