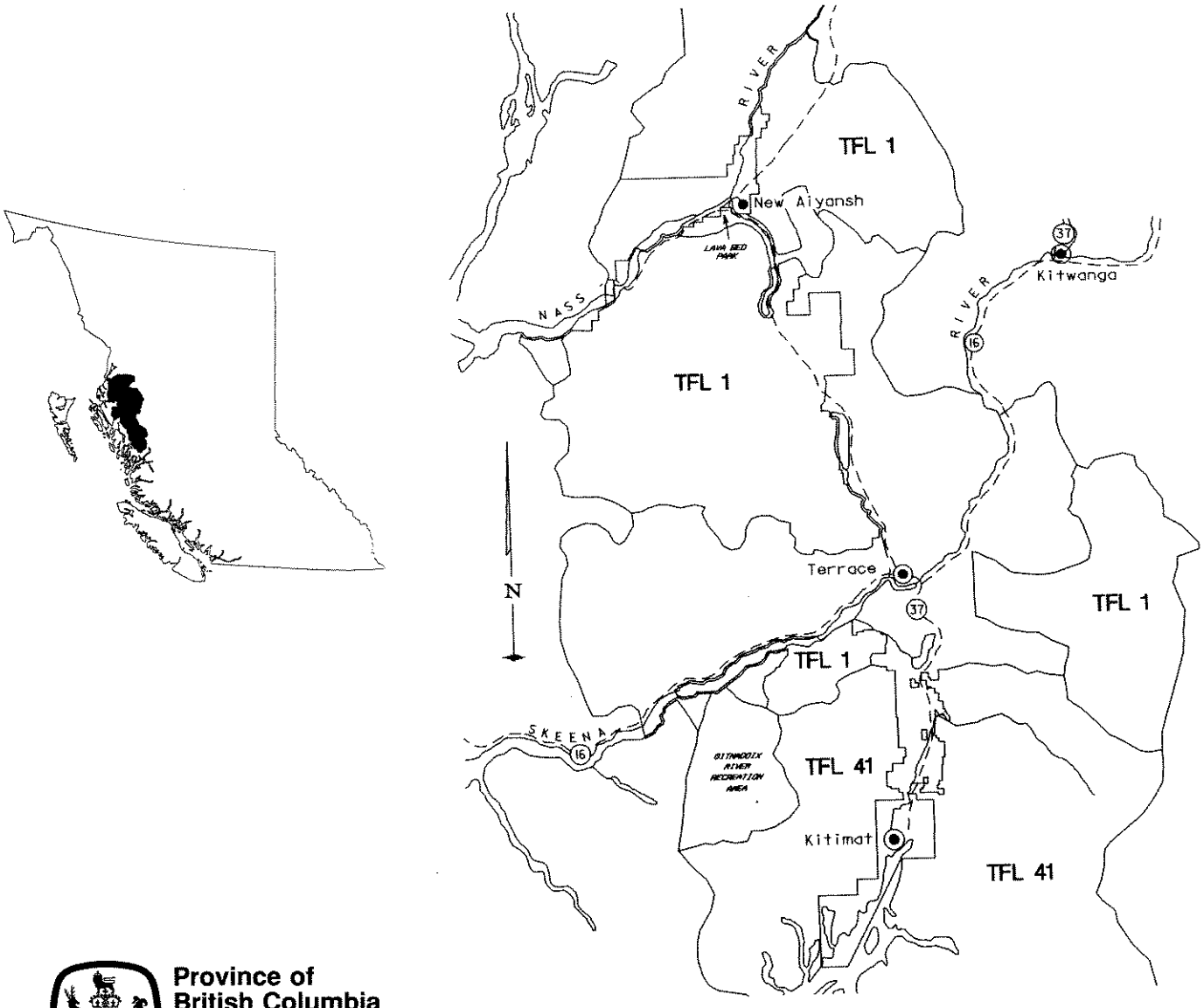
MINISTRY OF FORESTS

TIMBER SUPPLY SECTION
RESOURCE PLANNING BRANCH

Kalum-South Area of the Kalum Timber Supply Area

Timber Supply Review Discussion Paper
November 1994



Province of British Columbia
Ministry of Forests

Kalum-South Area of the Kalum Timber Supply Area

Timber Supply Review Highlights

- The British Columbia Forest Service is reviewing the timber supply in all timber supply areas* and tree farm licence* areas in the province. This review examines the impacts of current forest management practices* on the timber supply*, economy, environment and social conditions of the local area and the province. Based on the results of this review, the chief forester may decide to adjust the allowable annual cut* for the southern portion of the Kalum Timber Supply Area. The allowable annual cut determination resulting from a similar review in the northern portion of the Kalum Timber Supply Area is expected in early 1995.

- The current allowable annual cut in the Kalum-South area is approximately 17 per cent of the total allowable annual cut for the Kalum Forest District. This harvest provides wood to two large sawmills in Terrace and two pulp mills, one in Kitimat and one in Port Edward near Prince Rupert. (page 4)

- Timber harvesting in the Kalum-South area supports approximately 639 person-years* of employment in the local area, approximately 3.7 per cent of the total local labor force. An additional 514 person-years of employment are created provincially. (page 5)

- The timber supply analysis indicates that harvests must decline to a sustainable level within 20 years to avoid subsequent timber supply shortages. However, there is uncertainty about some of the assumptions and data used to produce this timber supply projection. If these are revised, the timber supply outlook may change. (page 7)

- Several factors suggest that the short-term timber supply may be even lower than initially predicted:
  - recent timber surveys indicate there may be less merchantable wood in the older forests than has been estimated (page 8)
  - non-conventional harvesting methods such as helicopters and long-reach skyline systems* may not be used as much as expected (page 8)
  - the area of mature timber that was deducted from the timber harvesting land base to protect non-timber resource values may be underestimated (page 8)

- Two factors indicate the short-term timber supply may be higher than predicted:
  - timber productivity estimates for regenerated forests may be underestimated, meaning that more timber may be available than predicted, and, more importantly, it may be available earlier than predicted (page 9)
  - the forested area that becomes non-productive after timber harvesting may be smaller than estimated (page 9)

- Two factors that have substantial impacts on the timber supply forecast are the acceptable management practices for visually sensitive areas (scenic viewscapes), and the minimum age at which forests are harvested. While the data used in the timber supply analysis for these factors were the best available, there are concerns that these data may not reflect appropriate practices, especially in the future. (pages 9-10)

- There may be opportunities to partially offset projected short-term reductions in timber supply by:
  - harvesting areas that are not currently considered economical or feasible to harvest
  - expanding the commercial thinning program (page 11)

- Intensive silviculture treatments in the Kalum-South area such as juvenile spacing and pruning are not predicted to increase the short-term timber supply but are expected to increase the long-term timber supply and the timber value. (page 11)

- The impact of adjustments in the timber supply on communities in the Kalum-South area is an important consideration in this review. A reduced harvest level may decrease the number of jobs created by the forestry sector. (page 11)

- 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. (page 12)

- A Land and Resource Management Planning* process for the Kalum-South area involving the public, interest groups and government agencies is currently underway. The social, economic and environmental goals for the Kalum-South area may be changed through this process. Another review of the timber supply in the Kalum-South area will be completed within five years to incorporate decisions from this process and new information on the impact of different forest management practices.

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

Definitions

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

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

Commission on Resources and Environment (C.O.R.E.)
An independent commission established to develop and test land-use planning processes in consultation with stakeholders.

Community Resources Board
A group of local people representing various community perspectives who assist government in resource management planning.

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

Environmentally sensitive areas
Environmentally sensitive areas mapped 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 late 1994.

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.

Long reach skyline harvesting methods
A timber harvesting method where logs are suspended off the ground and moved over 750 metres to the roadside.

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.

Timber harvesting land base
Crown forest land within the timber supply area that is currently considered feasible and economical for long-term 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 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.

Kalum-South Area of the Kalum Timber Supply Area

Introduction

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

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

The timber supply review for the southern portion of the Kalum Timber Supply Area (called the Kalum-South area in this review) is also providing important information to the Kalum South Community Resources Board*. The Community Resources Board will use this information to help determine future resource management goals through the Land and Resource Management Planning process.

This discussion paper summarizes the technical reports for the Kalum-South area and encourages British Columbians to comment on the findings. Public comments will be accepted until February 15, 1995. You will find a response form at the end of this paper to help you provide input.

Background to the Timber Supply Review

For at least 20 years, governments have known that British Columbia's timber supply would decline in the future—we could not keep cutting at the rate we've been going. Now there is an urgent need for up-to-date information to review the timber supply and allowable annual cuts throughout the province.

A 1991 study completed by the Forest Service, *A Review of the Timber Supply Analysis Process for British Columbia*, examined the procedures which led to the determination of allowable annual cuts, and confirmed the need for change. The study found that:

- existing allowable annual cuts were based on outdated information and management practices
- procedures failed to take into account integrated resource management practices and protection of non-timber values
- 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

Towards a sustainable future

British Columbians agree there is a need for sustainable resource management to ensure a strong forest economy, viable communities and a healthy environment—today and always. The Timber Supply Review is one of several government initiatives to achieve sustainability:

- The *Forest Renewal Plan* is a partnership of all the forest interests, working together to invest in increasing the value of the forests and strengthening the forest sector economy.
- The *Forest Practices Code* creates a single enforceable law to require better forest practices, with heavy penalties for violators.
- The *Timber Supply Review* is providing the information needed to adjust allowable annual cuts to ensure the sustainability of British Columbia's forests.
- The *Commission on Resources and Environment*, the *Protected Areas Strategy*, and *Land and Resource Management Plans* are moving to integrate all values into land-use planning in an effort to end confrontation and valley-by-valley battles.
- The *B.C. Treaty Commission* is moving us toward fair and equitable settlements of treaties which can create long-term social and economic stability for aboriginal and non-aboriginal British Columbians.

- silvicultural treatments, including reforestation
- standards of timber utilization
- constraints on the amount of timber produced 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, he cannot allow these determinations to be inappropriately influenced by the advocacy efforts of any group.

Timber Supply Review process

The Timber Supply Review is an improvement over past methods, with better information and superior analytical techniques. The process was designed to stimulate public discussion through the release of reports and this discussion paper, and to accommodate new information, techniques and ideas. Figure 1 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 Kalum-South 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.

Timber Supply Review in the Kalum-South Area

Forest Service staff in the Kalum Forest District finalized the data used for the Kalum-South area timber supply analysis in March 1994. This data is available for public review at the Kalum Forest District Office. The Forest Service then conducted and released a short- and long-term timber supply analysis (*Kalum South Timber Supply Analysis,* June 1994). A consultant also completed a socio-economic assessment of the timber supply forecasts (*Southern Portion of the Kalum Timber Supply Area: Socio-Economic Analysis,* November, 1994). Both reports are available from the Kalum Forest District office in Terrace and the Prince Rupert Forest Region office in Smithers.

This discussion paper summarizes these two

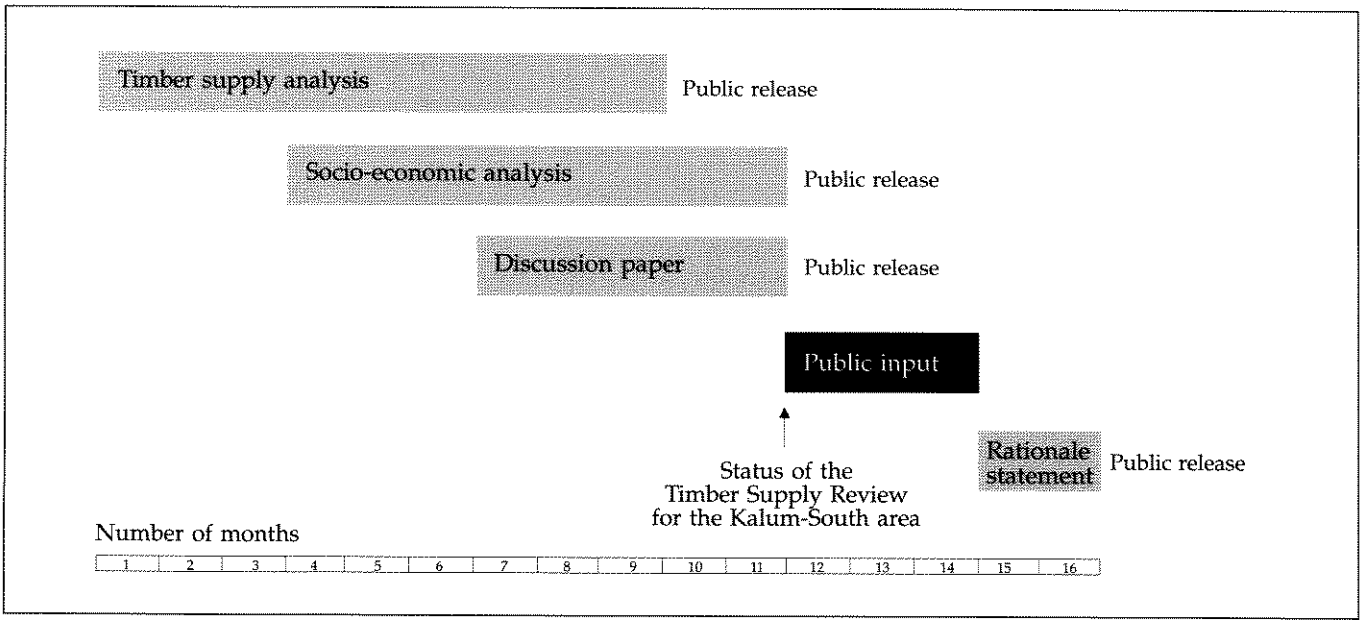


Figure 1 Steps in the Timber Supply Review process

reports and highlights critical factors that the chief forester must consider to determine the allowable annual cut for the Kalum-South area of the Kalum Timber Supply Area. In conjunction with the release of 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 February 15, 1995, and will be summarized in a report to the chief forester and the minister of forests.

The Kalum south Timber Supply Area includes distinct northern and southern portions which have different forest management practices and timber harvesting administration requirements. In 1987 an interim allowable annual cut for the timber supply area was set when major licences were awarded in the northern portion of the area. Separate allowable annual cuts are now required for the northern and southern areas to properly represent the differences in practices and administration. In order for the chief forester to determine separate allowable annual cuts, the existing Kalum Timber Supply Area must be legally split into two distinct timber supply areas.

In July 1993, the designation of the Nass Timber Supply Area, covering the Kalum-North area, was recommended to the minister of forests. The Forest Service solicited and received public input on this proposal through the Kalum-North Area Timber Supply Review Discussion Paper which was released to the public on July 22, 1994. This input will be forwarded to the minister of forests.

After the decision has been made on creating a separate timber supply area, the chief forester will weigh all of the factors and determine the allowable annual cut for the Kalum-South area in early 1995. This determination and a *Rationale Statement* for the determination will be released along with the *Summary of Public Input*.

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. Information will be provided to the chief forester on the timber supply impacts of these practices for consideration in this allowable annual cut determination. In most cases however, further implementation and experience with the Code will be required before the timber supply effects of new practices can be properly assessed, making it necessary to incorporate these factors in future allowable annual cut determinations.

The *Forest Act* requires the chief forester to reassess the allowable annual cut for each timber supply area and tree farm licence area at least every five years after this review is completed to incorporate new information, new practices and government policies. Implementation of major government initiatives such as the Protected Areas Strategy and the land-use recommendations of the Commission on Resources and Environment, and Land and Resource Management Plans may have significant impacts on the timber supply in specific timber supply areas and tree farm licences. In these cases, the chief forester may decide to determine the allowable annual cuts more frequently than every five years.

A process to develop a Land and Resource Management Plan has been underway in the Kalum-South area since early 1991. A Community Resources Board of 16 local people representing various community perspectives was formed in April 1993 to assist with planning. This process will lead to recommendations on new resource management objectives and strategies that balance social, economic and environmental values. Once these recommendations are approved by government, current forest management practices will be revised so they are consistent with these objectives.

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 *Kalum South Timber Supply Analysis Report*, and *SEA* is the *Southern Portion of the Kalum Timber Supply Area: Socio-Economic Analysis*)

Description of the Kalum-South area

Forest resources

The Kalum Timber Supply Area is located in northwest British Columbia in the Prince Rupert Forest Region. The Kalum-South area is the southern portion of the Kalum Timber Supply Area (see map on cover) and is a transitional area between coastal and interior forests. The climate and ecology of the area are very diverse because of the mountainous terrain and the high rainfall common in coastal areas. These conditions create a variety of ecosystems ranging from nutrient-rich, moist, flood plain soils in valley bottoms to high-elevation alpine meadows.

Kalum-South Area of the Kalum Timber Supply Area

The diversity of land forms, topography, and climate supports a variety of recreation activities. The Kitimat, Skeena and Nass rivers provide some of the best angling opportunities in British Columbia. Camping, nature study, hiking, swimming, boating, motoring, skiing, hunting and canoeing are activities enjoyed by local residents and tourists.

The Kalum-South area contains an abundance of land and marine wildlife, ranging from moose, grizzly and black bear to sea mammals and marine birds. The area supports a number of plant and animal species that require special consideration due to their rarity or restricted ranges.

A forest inventory that provides updated maps and forest statistics was completed in 1990 and updated in 1992. Mountainous terrain in much of the Kalum-South area limits the size of the timber harvesting land base*. Most of the land base is not available for timber harvesting (Figure 2) due either to lack of forest cover (approximately 55 per cent) or unsuitability for timber harvesting (environmental sensitivity*, rough terrain, difficult access or unmerchantable timber). Eighteen per cent of the total land base (103,878 hectares) is suitable for timber harvesting using current methods and land management objectives. (*TSAR* page 8)

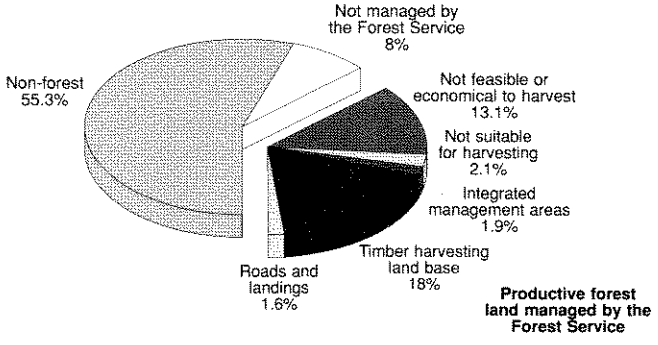


Figure 2 Classification of the land within the Kalum-South area

An equal amount of mature and immature forests are present within the timber harvesting land base in the Kalum-South area. The immature forests are mainly younger than 30 years old. In the past, harvesting has been concentrated on the good timber growing sites, leaving the remaining mature forests on medium and poor sites. Most of these forests are over 300 years old and the wood quality is generally poor, with approximately 40 per cent of the merchantable timber being suitable only for pulp.

Figure 3 shows the dominant tree species in the timber harvesting land base of the Kalum-South area. (*TSAR* page 10)

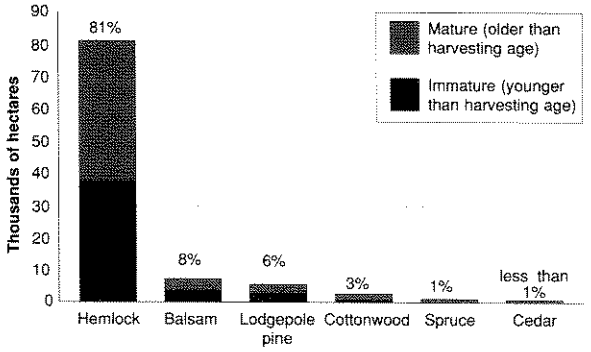


Figure 3 Area occupied by the dominant tree species in the timber harvesting land base

Current allowable annual cut

The total allowable annual cut in the Kalum Forest District is 2,850,000 cubic metres including:

- 1,250,000 cubic metres per year from the northern portion of the District (Kalum-North area)
- 720,000 cubic metres per year from Tree Farm Licence 1, which was reviewed by the chief forester earlier this year and maintained at this level
- 400,000 cubic metres per year from Tree Farm Licence 41, which was reduced earlier this year from 430,000 cubic metres per year by the chief forester
- 480,000 cubic metres per year from the Kalum-South area

Approximately 82 per cent of the allowable annual cut from the Kalum-South area is allocated to long-term timber tenures (72 per cent is allocated to one licensee), 16 per cent is harvested through the Small Business Forest Enterprise Program administered by the Forest Service, one per cent is allocated to woodlot licenses and one per cent is unallocated. (*SEA* page 25)

Socio-economic profile

The total population within the Kalum-South area is 32,032 (based on 1991 data), with 71 per cent residing in the communities of Terrace and Kitimat. The largest employment sector in Terrace is the service sector, with employers such as major department stores, supermarkets and hotels. Alcan Smelters and Chemicals Limited is the dominant employer in Kitimat. (*SEA* page 6)

Figure 4 illustrates the labor force within each industry in the Kalum-South area. (*SEA* page seven)

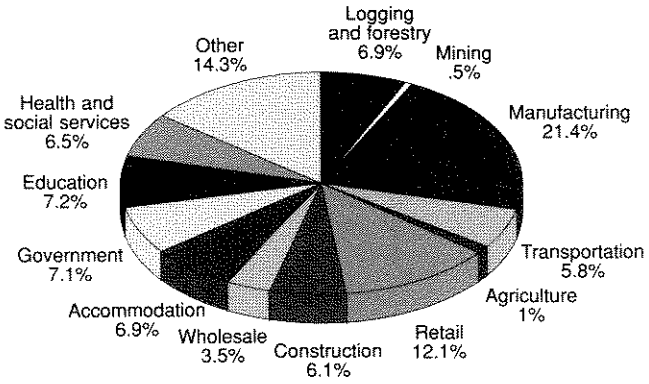


Figure 4 Labor force by industry for the Kalum-South area

The two main timber tenure holders in the Kalum-South area also have tree farm licences in the area. Each has a sawmill in Terrace, one has a pulp mill in Kitimat and the other has a pulp mill outside the Kalum Forest District near Prince Rupert.

Harvesting and processing the current allowable annual cut in the Kalum-South area generates an estimated 403 person-years of direct employment within the area. An additional 235 person-years of indirect employment are estimated to be created through forest company and employee spending, based on the assumption that for every direct job in the local forest industry, an additional 0.58 jobs are created elsewhere in the Kalum-South area. In total, the present allowable annual cut generates approximately 639 person-years of employment in the Kalum-South area. Figure 5 illustrates the types of employment that are created. (*SEA* pages 33-34, 41)

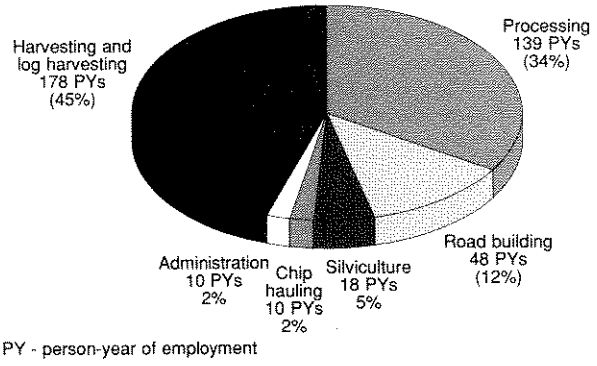


Figure 5 Types of forestry employment created

Harvesting and processing the allowable annual cuts from the two tree farm licences in the area has generated an estimated 1,104 person-years of direct employment.

Provincial economy and revenues

Processing of timber, chips and lumber shipped outside the Kalum-South area and employment generated by spending outside the area is estimated to create a total of 514 person-years of additional employment in the province. In total, forestry activities in the southern portion of the Kalum Forest District, including the two tree farm licences, have generated approximately 1,565 person-years of employment in the province, 88 per cent of which is created in the Kalum-South area.

In addition, approximately $7.2 million in provincial revenues are generated annually by timber harvesting in the Kalum-South area. This figure is based on the average total fees for harvesting public timber in the area ($2.26 per cubic metre based on 1993 information), plus estimated personal income taxes and other tax revenues of $12.69 per cubic metre. 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 revenues are expected to increase by as much as 80 per cent, it will not be possible to accurately estimate the impact of this change until the new policy has been in place for a period of time.

Current management practices

Public forest lands in British Columbia provide recreational enjoyment, fish and wildlife habitat, water supplies, timber resources and many other benefits. The Forest Service manages the forest, range and recreation resources on public lands. BC Environment 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 timber supply analysis was based on current management practices—practices that were actually being approved and implemented in the Kalum-South area in 1993, when this analysis was initiated. Changes in practices resulting from initiatives such as the Forest Practices Code, the Protected Areas Strategy and Land and Resource Management Plans will be addressed in the next reassessment of the timber supply.

Readers are encouraged to review the *Kalum South Timber Supply Analysis Report* (Pages 13-16 and Appendix A) for more detailed information.

Management zones and forest cover requirements

To assess the timber supply impacts of current integrated management practices, the timber harvesting land base was divided into the management zones described below. Each zone was given a specific forest cover requirement. These

requirements define the maximum amount of forest that can be younger than a certain age to ensure harvesting does not become overly dominant, and the minimum amount of area that must be covered by forests older than a certain age.

- **Visually sensitive zones** (32,896 hectares) - Includes areas that can be seen from highways 16 and 37, the Nisga'a highway, and from Douglas Channel near Kitimat. The management objective is to maintain sufficient forest cover to limit visible changes to the landscape. Three zones have been identified based on visual sensitivity and visual quality objectives:
  - less visually sensitive (modification) zone (21,696 hectares) - In this zone at least 76 per cent of the area within the timber harvesting land base must have trees at least five metres tall (approximately 20 years old) at any time.
  - moderately visually sensitive (partial retention) zone (8,932 hectares) - In this zone at least 87.5 per cent of the area must have trees at least five metres tall at any time.
  - most visually sensitive (retention/preservation) zone (2,268 hectares) - In this zone at least 92 per cent of the area must have trees at least five metres tall at any time.

- **Watershed/recreation zone** (2,708 hectares) - Includes areas in the Deep Creek and Thornhill community watersheds and the Shames and Onion Lake ski areas. The management objective is to maintain sufficient forest cover in these areas to maintain water quality and quantity, or recreation values. The zone is scheduled to be harvested in four entries so that at a given time, no more than 25 per cent of the zone will be under five metres tall (approximately 19 years old).

- **Integrated resource management zones** (68,276 hectares) - Includes the remaining timber harvesting land base not assigned to another zone. Separate zones were defined for specific geographic areas such as the Thunderbird Integrated Resource Management Area. These zones are scheduled to be harvested in three entries so at a given time, no more than 40 per cent of each zone will be under three metres tall (approximately 11-15 years old).

Current practices

The current forest management practices that are approved and implemented in each zone are briefly described below. The *Interim Timber Harvesting Guidelines for the Interior Portion of the Prince Rupert Forest Region* and the *British Columbia Coastal Fisheries/Forestry Guidelines* outline current forest management practices in the Kalum-South area.

- **Basic silviculture** - British Columbia laws require areas that are harvested and expected to produce timber in the future must be reforested with ecologically acceptable species within a specified time frame (three to six years was used in the analysis). The most common silviculture 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 the most productive sites in the Kalum-South area.

- **Protection** - Forest losses due to wildfire, insects, diseases and blow down are minimized as much as possible. Losses of merchantable timber to fire and wind are expected to be 9,500 cubic metres per year. Losses to pests (insects, disease, animals) are assumed to be negligible. The spruce leader weevil has forced the conversion of young spruce plantations to alternative species such as hemlock, balsam and cedar.

- **Stream and old-growth protection** - *British Columbia Coastal Fisheries/Forestry Guidelines* guide current forest management practices and also suggest the minimum width of stream buffers required to protect fish habitat, based on the size of the stream and the types of fish that use the stream. Stream buffers from 10 metres to 30 metres were used in the timber supply analysis. A total of 2,306 hectares were removed from the timber harvesting land base to protect streamside areas throughout the Kalum-South area, and to account for old-growth reserves defined in the *Thunderbird Integrated Resource Management Plan.*

- **Wildlife/biodiversity**
  Sensitive wildlife habitats, mainly moose winter range in large riparian areas, were wholly or partially deducted from the database for the timber supply analysis. Streamside buffers, forests that are not considered feasible for timber harvesting due to low timber volumes, and other environmentally sensitive areas that were deducted from the timber harvesting land base also contribute to wildlife habitat and biodiversity.

  To provide adequate old-growth habitats, at least 12 per cent of the area in each management zone must be maintained in forests more than 150 years old at all times. In zones where this minimum is not met by deductions from the timber harvesting land base for other purposes, timber harvesting is restricted to meet this requirement.

  The *Interim Timber Harvesting Guidelines for the Interior Portion of the Prince Rupert Forest Region* require that the forest cover in a harvested area

must be at least three metres tall (estimated to be 11 to 15 years old) before the adjacent timber can be harvested.

- **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 70 to 140 years based on long-term timber production rates. The average harvest age in the long term is approximately 130 years.

- **Timber utilization** - Within cutblocks, timber that meets or exceeds the following size limits and is suitable for manufacturing lumber or pulp chips must be utilized:
  - diameter at stump: lodgepole pine - 15 centimetres; other species - 20 centimetres
  - diameter at top: cedar older than 141 years - 15 centimetres; other species - 10 centimetres

- **Soil conservation** - Harvesting layout follows provincial and regional guidelines. For the timber supply analysis 8.8 per cent of the timber harvesting land base was deducted for existing roads, landings, and major debris piles that have become non-productive through harvesting. To account for future roads, landings and major debris piles, the remaining land base was reduced by eight per cent.

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 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 the Kalum-South area, a computer model was used to produce a base case* timber supply forecast that met all of the following conditions:

- it maintained the current allowable annual cut, or if this was not possible, the highest initial harvest level, for as long as possible
- it reduced the timber supply level by a maximum of 10 per cent per decade, avoiding any future harvest shortfalls, until the long-term sustainable timber supply level was reached
- it maintained the timber supply levels at or above the predicted long-term sustainable level

The base case forecast for the Kalum-South area, which was produced using the best information that was available when the analysis was conducted in 1993 and which meets the conditions described above, indicates the present allowable annual cut cannot be maintained in the Kalum-South area in the short- or long-term. The analysis indicates that to avoid severe timber shortfalls in the future, harvests should decline within 20 years to the long-term timber supply level of 400,000 cubic meters per year, 16.7 per cent below the current harvest level. (*TSAR* pages 18-19) Several factors discussed below indicate that an even more drastic short-term decline may be required.

There are several ways to phase in this reduction. The base case forecast in Figure 6 indicates that an immediate reduction of 3.3 per cent, or 16,000 cubic metres per year, is necessary to avoid deductions of more than 10 per cent after the first 10 years.

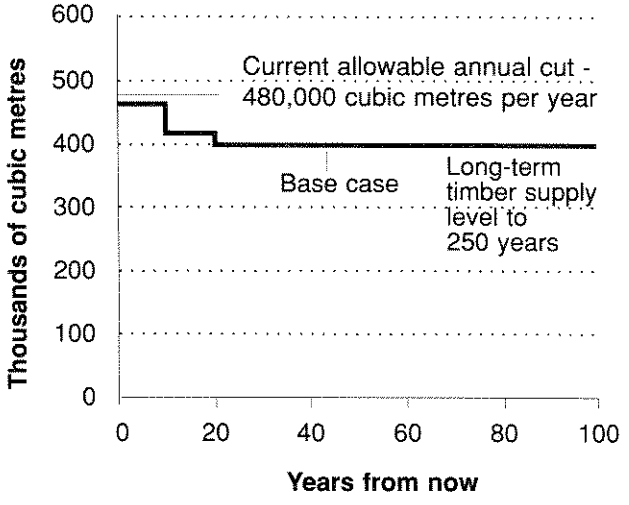


Figure 6 Base case timber supply forecast

Critical factors

Since 1993 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.

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

- **Estimates of merchantable timber in existing mature forests**
  Existing mature forests in the Kalum-South consist of mainly hemlock and balsam that more than 300 years old. Many of these trees are decayed and unmerchantable. A summary of recent timber surveys suggests that the merchantable timber volumes used in the base case analysis may overestimate the actual timber volumes in these forests by as much as 18 per cent.

  This factor has a significant impact on the short-term timber supply. As an example, Figure 7 illustrates that if existing volumes are overestimated by 20 per cent in the base case forecast, an immediate decline in the harvest level is required to avoid severe shortfalls in the future. Two alternative forecasts illustrate options to balance short- and mid-term impacts.

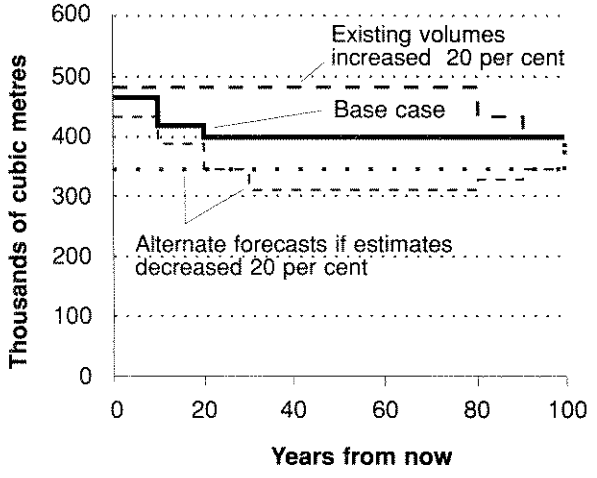


Figure 7 Impact of reduced estimates of timber volumes for existing mature forests

- **Projected use of non-conventional harvesting methods**
  Forest inventory data was used to define the land base that is suitable for harvesting with conventional and non-conventional harvesting methods. In the Kalum-South area, non-conventional methods include helicopters and long-line skylines with yarding distances greater than 750 metres. To date very little harvesting has occurred with non-conventional methods, however, the timber supply analysis projected that their use would increase, and therefore the land base for these methods was included in the timber harvesting land base.

  The area that is suitable only for non-conventional harvesting methods is estimated to contain approximately 13 per cent of the existing merchantable timber in the timber harvesting land base. If the use of these methods does not increase as projected, this area should be deducted from the timber harvesting land base, which will reduce the short-term timber supply. Figure 8 shows the timber supply impacts if the area with mature forests in the timber harvesting land base is reduced. (*TSAR* pages 38-39)

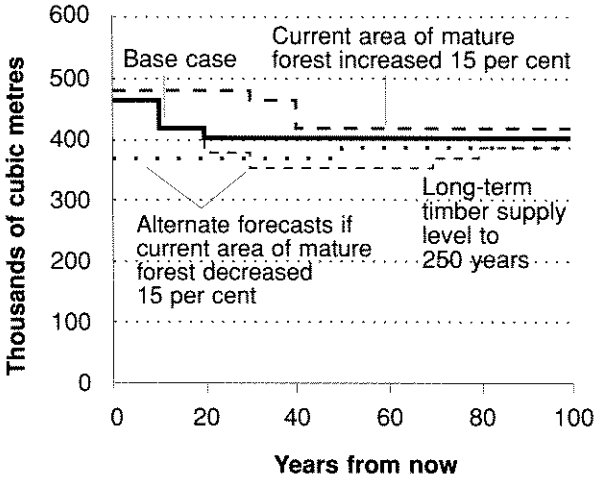


Figure 8 Impacts of a reduced area of mature forest within the timber management land base

- **Practices to protect non-timber resources**
  Several of the management practices that are implemented to protect non-timber resources result in a reduction in the area of mature forest in the timber harvesting land base, which often impacts short-term timber supply. The estimates used in the timber supply analysis to allow for the following practices are of particular concern in the Kalum-South area:

  - **stream buffers**
    In the timber supply analysis, the widths used for stream buffers where harvesting is not permitted are the minimums suggested in the *British Columbia Coastal Fisheries/Forestry Guidelines*, except in the Thunderbird area where the requirements of the Integrated Resource Management Plan were followed. If these minimums are not adequate to protect fish habitat, wider buffers may be required, and that would reduce the area of mature timber in the timber harvesting land base.

- **old-growth reserves and ecosystem networks**
  In the base case timber supply forecast, 12 per cent of each major forest type was maintained as old growth, as specified in the *Interim Timber Harvesting Guidelines for the Interior Portion of the Prince Rupert Forest Region*. BC Environment is also stressing the need to identify and establish networks of ecosystems and habitat types, including old-growth areas, with linkages between watersheds throughout the timber supply area. The area deducted from the timber harvesting land base for stream buffers, environmentally sensitive areas, old-growth reserves, forests that are not feasible or economical to harvest and areas required to meet the old-growth conditions may be adequate to create ecosystem networks. However if additional area is required, this will reduce the area of mature timber in the timber harvesting land base.

- **Forest Practices Code**
  As the Forest Practices Code had not been passed when the data for the timber supply analysis was prepared, it was not possible to directly assess the impacts of the Code in the analysis. Because the *Interim Timber Harvesting Guidelines for the Interior Portion of the Prince Rupert Forest Region* and the *British Columbia Fisheries /Forestry Guidelines* which provided the basis for the Code, have been implemented in the Kalum-South area, extensive changes in forest management practices are not anticipated to meet the requirements of the Code. Changes that can be identified and quantified will be incorporated in the allowable annual cut determination in this review.

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

- **Timber productivity estimates for regenerated forests**
  The biological productivity of a forest site is the main factor that determines how quickly trees will grow on that site, what the expected timber volumes from regenerated forests will be, and when these forests will be suitable for harvesting. The most accurate assessments of site productivity are based on the growth of 30 to 150-year-old forests. Because there are very few forests in the Kalum-South area in this age range, it is difficult to accurately assess the timber productivity of these sites.

It is the opinion of the Kalum Forest District staff that the data used for the base case forecast most likely underestimate timber productivity in the Kalum-South area. A study is being completed to provide improved timber productivity estimates.

In the timber supply analysis, a test of the impacts of changing the site productivity estimates for regenerated forests was completed based on field observations by district staff. Figure 9 shows that if the timber volumes are actually 50 per cent higher than estimated for the base case forecast, the timber supply follows the base case for 70 years before rising to a much higher long-term level. This figure also shows that if the minimum harvest ages are also reduced by 20 years (based on the assumption that trees that grow faster will become merchantable sooner), the timber supply forecast indicates the current allowable annual cut could be maintained for 60 years followed by an increased long-term level. (*TSAR* page 35)

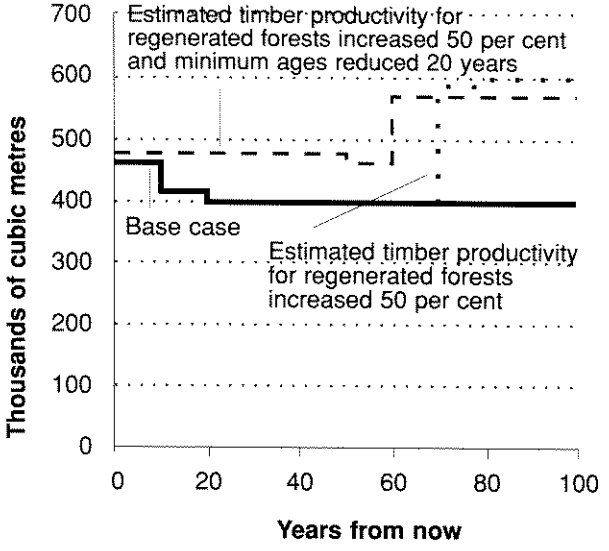


Figure 9 Impacts of changing the timber productivity estimates for regenerated forests

- **Reducing the area of roads and landings created during harvesting**
  The amount of productive forest land that is converted to non-productive areas such as roads, landings and major debris piles during harvesting directly affects the size of the timber harvesting land base and the projected timber supply. In the timber supply analysis it was estimated that 8.8 percent of the area that has been harvested is now non-productive, and eight per cent of the area that will be harvested in the future will become non-productive. Concerns have been raised that these estimates may slightly overestimate the actual area that becomes non-productive.

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

- **Forest cover requirements for visually sensitive areas**
  Management of visually sensitive areas is accomplished by first classifying the sensitivity of

these areas, and then defining the amount of change due to harvesting that is acceptable for each level of sensitivity. Both the classification of visual sensitivity and the amount of acceptable change that was defined in the timber supply analysis for viewscapes in the Kalum-South area may be inappropriate.

Figure 10 illustrates the timber supply impacts of making visually sensitive areas either more or less restrictive to harvesting.

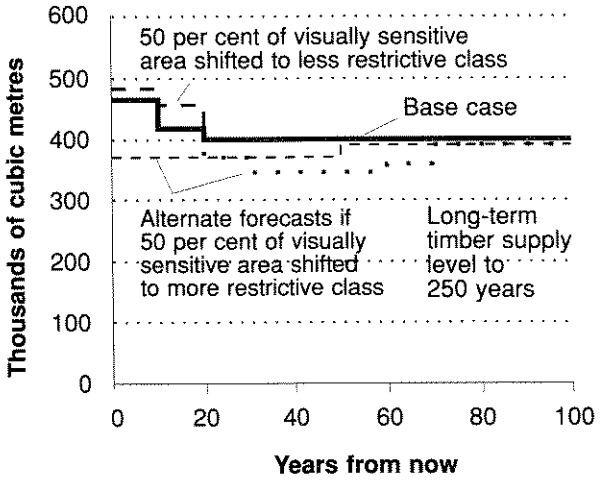


Figure 10 Impacts of changing the visual sensitivity classification of viewscapes in the Kalum-South area

The effect of changing the area that is permitted to be visually altered is shown in Figure 11, including the impact of removing all restrictions on timber harvesting beyond those required for other resources.

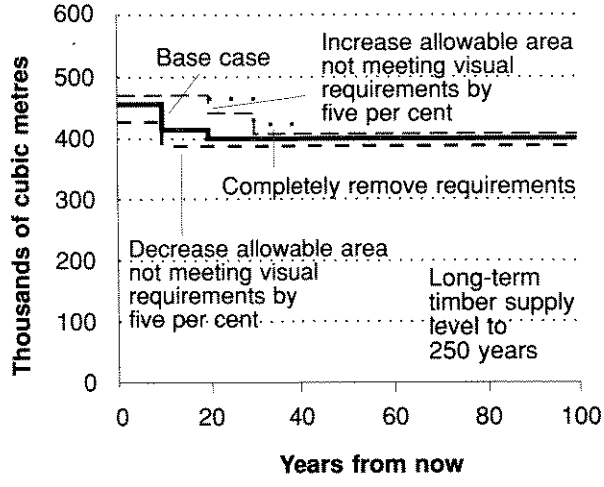


Figure 11 Impacts of changing the acceptable amount of area that may be visually altered

In visually sensitive areas, the regenerated forest in cut-over areas must be at least five metres tall, which is estimated to be reached in approximately 22 years, before adjacent timber can be harvested. There are two reasons why there is uncertainty about these 'green-up'* requirements:

- it is possible that the defined minimum height may not provide the forest conditions that are required to meet the visual-quality objectives
- it may take regenerated forests less or more time than was estimated to reach this minimum height

Changing the green-up requirements for visually sensitive areas has a substantial effect on projected timber supply forecasts in the Kalum-South area. For instance, if green-up ages are three years longer than estimated in the base case, the timber supply immediately declines to the long-term level to avoid future timber supply shortfalls.

- **Minimum harvest ages**

Minimum harvest age is an estimate of the time it takes for a forest to reach a specified merchantable condition. It also defines when second growth will be available for harvesting and, therefore, determines how long the timber industry must rely on the existing mature timber supply.

The minimum harvest age depends on the type of forest product that is to be produced and the expected time it will take for forests to reach the condition required to produce that product. Both of these factors are, to some degree, unknown.

Figure 12 shows the effect on timber supply if the minimum harvest ages used to produce the base case harvest forecast are increased or decreased by 20 years.

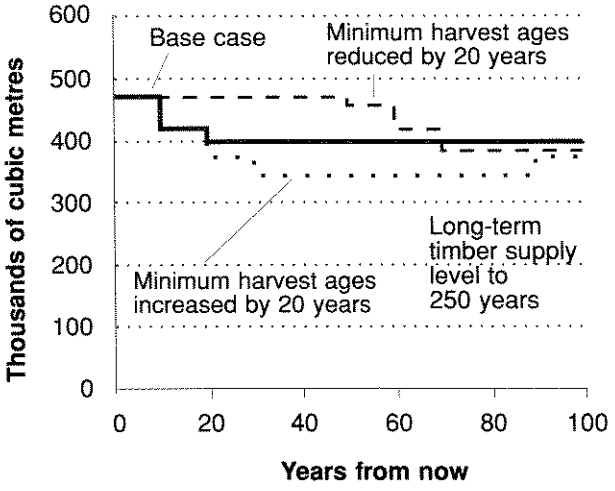


Figure 12 Impact of changes in minimum harvest ages

Possible opportunities to change practices to partially offset timber supply reductions

- **Harvesting areas that are currently not considered economical to harvest**
  The harvesting practices being implemented when the data was prepared for the timber supply analysis determined what areas were included in the timber harvesting land base. Forest inventory data was used to identify areas where it is currently feasible to harvest based on the terrain, soil stability, and amount of merchantable timber. Determining the long-term timber harvesting land base is difficult, however, because of changing markets, technology and social values.

  Recently a small amount of harvesting has occurred in areas where harvesting was originally not assumed to be feasible. However these areas have only recently been harvested and the regeneration success and environmental effects of harvesting these sites have not been determined.

- **Intensive silviculture**
  For the next five years, intensive silviculture treatments such as juvenile spacing and pruning are planned for approximately 3,000 hectares within the Kalum-South area annually. After this time it is estimated that 1,500 hectares will be treated annually. It is possible that investments through the Forest Renewal Plan will prompt expansion of this program.

  The objectives of these treatments are to reduce the age at which regenerated forests reach merchantable sizes to minimize timber supply shortfalls projected in the mid- and long-term, and to increase the quality of the timber harvested from second growth forests. These treatments are not expected to offset immediate timber supply shortages because the treated forests will not reach merchantable size in the short term.

- **Commercial thinning**
  The relatively long history of harvesting in the Kalum-South area has created forests that are 40 to 100 years old and are candidates for commercial thinning. A small program of commercial thinning is currently underway in the Kalum-South area, with plans to expand this activity to a target level of 500 to 1,000 hectares annually. The actual amount of area that is thinned will depend on the funding available and the market value for the products.

  The timber supply analysis indicates that while the short-term timber supply can be increased through commercial thinning, there is no projected impact on the long-term timber supply (*TSAR* page 47).

Environmental and socio-economic impacts

Environmental concerns

Staff of BC Environment and the federal Department of Fisheries and Oceans both review harvesting development plans and support many of the current practices used in the Kalum-South area to protect fish and wildlife habitat. Implemention of the Forest Practices Code should address remaining concerns about fish and wildlife habitat management.

The timber supply analysis indicates that most of the forests older than minimum harvest age and available for timber harvesting are approximately 300 years old (*TSAR* page 23). In the base case, over the next 50 years, the area of these older stands will be significantly reduced. The removal of a significant portion of the remaining old growth over this period may be detrimental to the biodiversity in the area. There is concern about fragmentation of habitats and loss of critical wildlife habitats for old-growth dependent species such as grizzly bears. (*SEA* page 38)

The establishment of road access into previously unroaded areas is also a concern. Increased hunting and angling pressure on wildlife and fish populations is anticipated with improved access.

First Nations impacts

Although relatively few Nisga'a are employed by the forest industry, they are concerned that this employment is not secure from year to year. Another Nisga'a First Nation concern is with timber harvesting that occurs in areas with high traditional and non-timber values such as pine mushroom picking areas, yellow cedar stands and trapping.

The Kitsumkalum and Kitselas people depend upon forests in the Kalum-South area for cultural, medicinal and food sources, and these values have been compromised by past forestry activities. On the other hand, some of these people from this nation are employed in the forest sector. For them, and others considering working in the forest sector, a reduction in harvest levels may have a significant negative economic impact. (*SEA* page 36)

Community impacts

In the *Socio-Economic Assessment* it was assumed that a change in timber supply would create economic impacts that are directly related to the size of the reduction or increase (i.e. a 10 per cent increase in timber supply would result in a 10 per cent increase in forestry employment). As a result, if the chief

forester reduced the allowable annual cut to conform to the base case harvest level, with its initial 3.3 per cent reduction, it is estimated that a total of 22 person-years of local employment would be lost. If the allowable annual cut was immediately reduced by 16.7 per cent to the long-term sustainable level of 400,000 cubic metres per hectare, 107 person-years of local employment would be lost. Employment impacts would be mainly distributed among the native communities and the community of Terrace. (*SEA* pages 46-48)

Although the larger communities in the Kalum-South area have broad and stable community infrastructures, they are still dependent on the timber sector. The impact of these job losses on those communities will depend on the extent to which alternative sources of employment are available. New jobs could be created in areas such as value-added manufacturing, silviculture and forestry planning, as well as through initiatives of the new Forest Renewal Plan. It is important to keep in mind that timber harvesting in the two local tree farm licenses generates more employment and supplies more wood to local mills than timber harvesting in the Kalum-South area of the Kalum Timber Supply Area.

Freshwater fishing represents the largest portion of the Kalum-South area's tourism industry. However, the impact of a reduced timber harvest on tourism jobs is difficult to predict. The Forest Practices Code will ensure fish habitat is protected which should protect tourism jobs associated with freshwater fishing.

Provincial impacts

If the chief forester adjusted the Kalum-South area allowable annual cut to conform to the base case harvest level, with its initial 3.3 per cent reduction, it is estimated that, in total, 40 person-years of employment would be lost provincially. If the allowable annual cut was immediately reduced by 16.7 per cent to the long-term sustainable level of 400,000 cubic metres per hectare, then, in total, 193 person-years of employment would be lost provincially.

If the allowable annual cut were reduced by 3.3 per cent and current taxation procedures were maintained, annual provincial government revenues would decline by $0.3 million. If the allowable annual cut were reduced by 16.7 per cent and current taxation procedures were maintained, annual provincial government revenues would decline by $1.2 million. As stated earlier, these estimates do not include increased stumpage revenue from the recently announced Forest Renewal Plan.

Chief forester's determination

The base case timber supply forecast is not the only pattern the chief forester could chose to adjust the short-term allowable annual cut as part of a strategy to achieve the long-term harvest reduction. Several alternatives exist:

- the allowable annual cut could be maintained for 10 years followed by a 16.7 per cent reduction to the long-term level
- the current allowable annual cut could be maintained for as long as possible, resulting in timber shortages in the future
- a consistent level of decline could occur throughout the transition period
- large reductions could be made now, with smaller reductions in the future

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

The Land and Resource Management Planning process

A Land and Resource Management Plan is currently being developed for the Kalum-South area. This plan provides an opportunity for the public and interest groups to work with government agencies to make choices about future management of public forest lands in the area. As new practices and land-base designations created through this initiative are approved by government and implemented in the Kalum-South area, they will become "current practices" and will be assessed in the next timber supply review which must be completed within five years.

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 Kalum-South area of the Kalum 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 February 15, 1995.

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

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

For more information contact:

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District Manager
Kalum Forest District
200-5220 Keith Avenue
Terrace, B.C.
V8G 1L1
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Fax: (604) 638-3437

Kalum-South Area of the Kalum Timber Supply Area Timber Supply Review

Discussion Paper Response Form

The *Forest Act* requires the chief forester to consider the following factors to determine the allowable annual cut for timber supply areas and tree farm licence areas:

- the rate of timber production that can be sustained from the area
- the short- and long-term implications for the province of alternative rates of timber harvesting from the area
- the timber requirements of established and proposed timber processing facilities
- the economic and social objectives of the Crown, as expressed by the minister, for the area, for the general region, and for the province
- abnormal pest infestations in the timber on the area, and major salvage programs that are planned

The technical reports that have been prepared for the Timber Supply Review of the Kalum-South area provide information on these factors. We welcome further input from the public to ensure the best available information is used in the allowable annual cut determination. Please provide your comments on this form, or in another format by February 15, 1995.

A. Economic and social objectives

Please use the space below to provide your comments regarding the economic and social objectives you believe should be considered in determining the allowable annual cut for the Kalum-South area.

B. Technical forestry factors and impacts of alternative rates of harvest

Please use the space below to provide any information which you believe may assist the chief forester in considering the technical factors to determine the allowable annual cut for the Kalum-South area. Further information on the critical factors outlined on pages seven to 11 in this paper would be most helpful.

Which community sector listed below best describes your interests?

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

Name (optional) _____

Address (optional) _____

Mail your comments to:

Brian Downie
District Manager
Kalum Forest District
200-5220 Keith Avenue
Terrace, B.C.
V8G 1L1
Phone: (604) 638-5100
Fax: (604) 638-3437