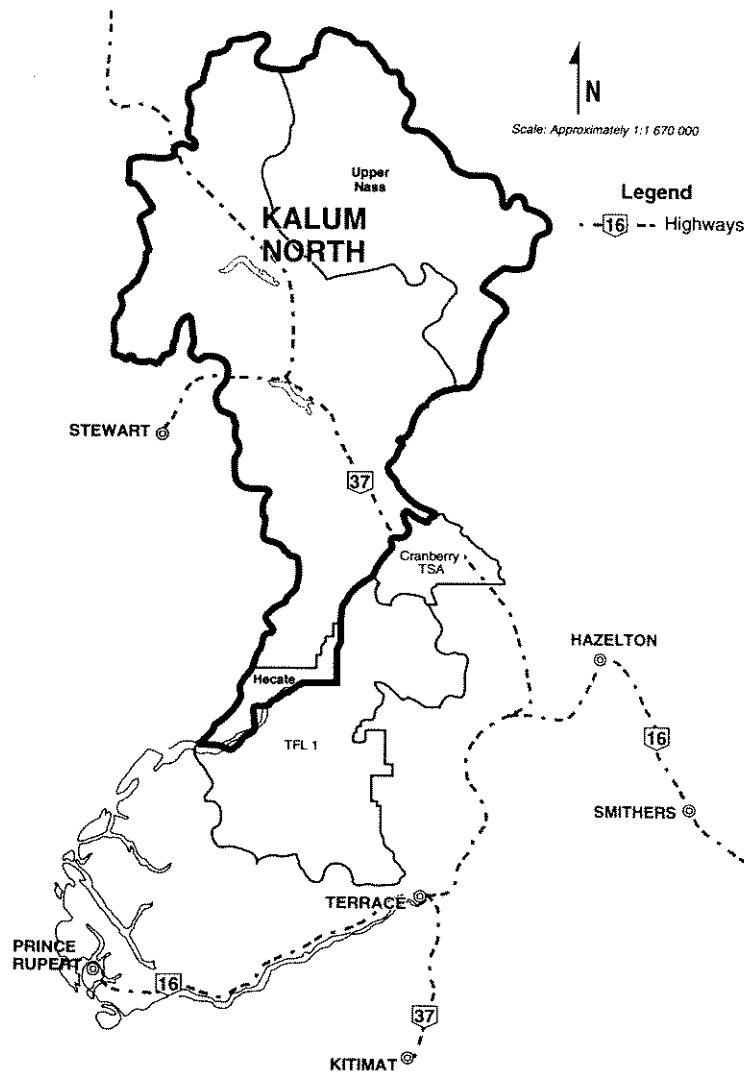
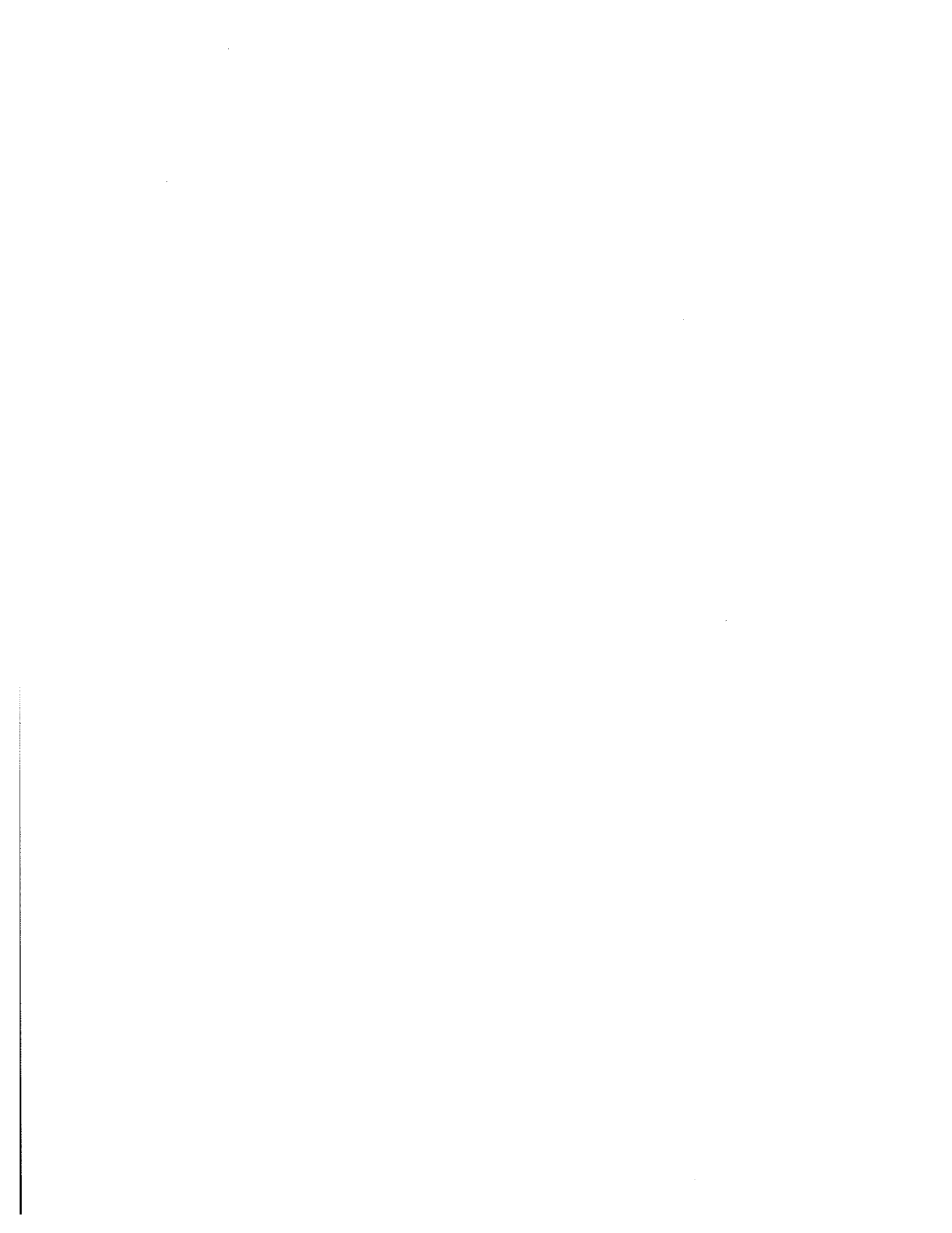




# Kalum-North Area of the Kalum Timber Supply Area

Timber Supply Review Discussion Paper  
July 1994





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## Timber Supply Review Highlights

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- The British Columbia Forest Service is reviewing the timber supply in all timber supply areas\* and tree farm licences\* in the province. The review examines the impact 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 northern portion of the Kalum Timber Supply Area (Kalum-North area).
  - The current allowable annual cut of 1.25 million cubic metres per year in the Kalum-North area provides approximately 493 person-years\* of forestry employment within the region which generates 222 person-years of indirect employment. In addition to regional employment, a total of 705 person-years of employment are created provincially from the current harvest. This illustrates the linkages between the forestry sector in Kalum-North area and the rest of the provincial economy. (p. 4)
  - Under current management practices, the present allowable annual cut can be maintained for 30 years, but it cannot be maintained over the long term. Over the next 120 years, the timber supply is projected to decline to a sustainable level of 410,000 cubic metres per year. (p. 7)
  - There are several factors that suggest the short-term timber supply may be lower than initially projected:
    - there may be less area available for timber management than assumed in the analysis because of environmental or economic factors (p. 8);
    - the impact of management practices which conserve non-timber resource values such as viewscapes, recreation areas, water-flow patterns, wildlife habitat, old-growth forests and biodiversity, may be greater than expected (p. 9); and,
    - there may be less merchantable timber in the older forests than has been estimated. (p. 10)
  - Reductions in the short-term timber supply may be partially offset by increasing the timber harvesting land base by:
    - implementing partial-cutting harvesting practices in stream-side zones that currently are not harvested; (p. 9);
    - harvesting timber in areas determined to be unavailable for harvesting because of physical or environmental factors (p.9); and,
    - harvesting lower-elevation sites that currently are not economical or feasible to harvest (p. 9).
  - Increasing estimates of yields from regenerated timber stands in the Kalum-North area are not likely to increase the short-term timber supply, although a test completed during the timber supply analysis indicates an increase in the long-term timber supply is possible. (p. 10)
  - Several alternatives exist for the chief forester to adjust the short-term allowable annual cut as part of a strategy to achieve the long-term harvest reduction:
    - the allowable annual cut could be maintained at the present level for 30 years, and decline by 10 per cent each decade until the long-term level is reached;
    - the allowable annual cut could be maintained at the present level beyond 30 years, requiring severe declines in the future;
    - small reductions could be implemented now, with larger declines in the future;
    - a consistent level of decline could occur throughout the transition period; or,
    - larger reductions could be made now, with smaller declines in the future.
  - The impact of adjustments in the timber supply on local communities is an important consideration in this review. The communities in the region, particularly Stewart, have a high degree of dependence on the forest sector for employment and income. Several opportunities exist for the forest sector to reduce employment impacts as the timber supply is adjusted. Other opportunities may be created through the Forest Renewal Plan. (p. 10)
  - It has been proposed that the Nass Timber Supply Area be created, including the area referred to as Kalum-North in this paper. Public input is encouraged before this decision is made.
- \* 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.

# Kalum-North Area of the Kalum Timber Supply Area

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## Definitions

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### **Allowable annual cut**

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

### **Base case forecast**

The timber supply harvest forecast that illustrates the effects of current forest management practices on the timber supply using the best information that was available when the analysis was initiated.

### **Commission on Resources and Environment (CORE)**

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

### **Current management practices**

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

### **Environmentally sensitive areas**

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

### **Forest license**

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 that requires better forest practices, with heavy penalties for violators. A draft Forest Practices Code for B.C. was recently released for discussion and review. The final code is currently planned for implementation in the fall of 1994.

### **Green-up period**

The time required for a stand of trees to reach a desired condition after harvesting (usually height) to meet integrated resource management objectives and allow additional harvesting within 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 over one or two years, 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**

The Protected Areas Strategy is a provincial initiative that is looking at protecting certain percentages of each ecosystem on a regional basis. This may result in some areas in the Kalum-North being protected from timber harvesting.

### **Representative forest types**

Representative forest types were used in the analysis to identify the area to be excluded from the timber harvesting land base to meet biodiversity and old-growth objectives.

### **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 license**

An agreement entered into with the provincial government which provides for the establishment, management and harvesting of timber by a private interest on a described area of Crown land.

### **Unmerchantable forests**

Unmerchantable forests are stands of a size, quality or condition of timber that are not suitable for marketing under current economic conditions. Stands which were once considered non-merchantable may become economically merchantable because of changing markets or reduced harvesting costs by increased efficiency. The environmental effects of harvesting will be assessed before these areas are logged.

# Kalum-North Area of the Kalum Timber Supply Area

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## Introduction

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The British Columbia Forest Service is conducting a Timber Supply Review in the 36 timber supply areas and 35 tree farm licences throughout the province. The objectives of this three-year review include:

- 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; and,
- providing the chief forester with information to make necessary adjustments to the allowable annual cuts for the next five years.

This discussion paper summarizes the technical reports from the Timber Supply Review in the northern portion of the Kalum Timber Supply Area (called the Kalum-North area in this review) and encourages British Columbians to comment on the findings. Public comments will be accepted until October 20, 1994. You will find a response form at the end of this paper to help you provide input.

## Background to the Timber Supply Review

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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; and,
- analytical techniques had to be strengthened.

As a result, very few analyses were completed within the past decade, 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 his most important responsibilities since it affects the local 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:

- the sustainable rate of timber production from the area;
- the short- and long-term implications for the province;
- the timber requirements of processing facilities;
- insect or disease infestations; and,
- the government's economic and social objectives for the area, for the region and for the province, as expressed by the minister of forests.

Some of these factors can be measured and analyzed—others cannot. Ultimately, the chief

## 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 forest 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 towards fair and equitable settlement of treaties which can create long-term social and economic stability for aboriginal and non-aboriginal British Columbians.

# Kalum-North Area of the Kalum Timber Supply Area

forester's determination is based on professional judgment. By law, the chief forester is independent of the political process and does not take direction from the minister of forests in determining allowable annual cuts. Nor does the chief forester consider the advocacy efforts of lobby groups.

## 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-North area and the estimated time required to complete each step in the process.

The review process for existing tree farm licence contracts is similar, but these contracts require less emphasis on socio-economic impacts. When tree farm licence contracts are replaced, the process will be changed to conform to the timber supply review format.

Three technical reports have been prepared to assist the chief forester with the allowable annual cut determination for the Kalum-North area. The B.C.

Forest Service first conducted a short- and long-term timber supply analysis (*Kalum-North Timber Supply Analysis*, February, 1993). A consultant then completed a socio-economic assessment of the timber supply forecasts (*Socio-economic Assessment of Timber Supply Options for the Northern Portion of the Kalum TSA*, June, 1993).

After the release of the timber supply analysis report, the methods used to estimate existing timber volumes changed. These changes became the provincial standard so an addendum report (*Kalum-North Timber Supply Analysis Addendum*, August, 1993) was also produced. These reports are available from the Kalum Forest District office in Terrace, the Stewart field office, and the Prince Rupert Forest Region office in Smithers.

This discussion paper summarizes these reports and highlights critical factors that the chief forester must consider to determine the allowable annual cut for the Kalum-North portion 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 October 20, 1994.

Public input will be summarized in a report to the chief forester and the minister of forests. The minister considers input on the socio-economic factors to define the government's social and economic objectives for the area, the region, and the province, which he provides to the chief forester. The chief forester considers comments on technical forestry matters.

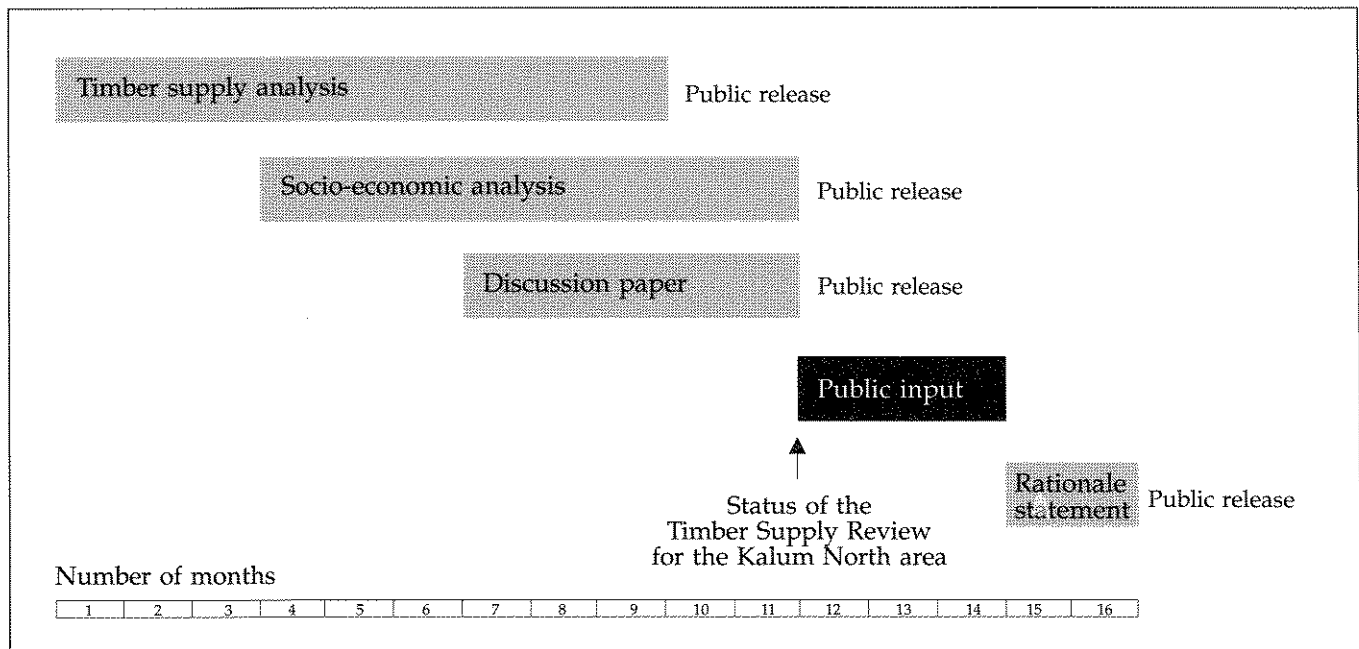


Figure 1. Steps in the Timber Supply Review process

# Kalum-North Area of the Kalum Timber Supply Area

Once the decision has been made to create a separate timber supply area and after weighing all of these factors, the chief forester is expected to determine the allowable annual cut by the winter of 1994. This determination and a statement of the rationale for the determination will be released to the public along with the summary of public input. The current harvest level for the Kalum-North area has been approved as part of an interim allowable annual cut for the Kalum Timber Supply Area.

In order for the chief forester to determine a separate allowable annual cut for the Kalum-North area, a distinct timber supply area must be legally created. In July 1993, the designation of the Nass Timber Supply Area, covering the Kalum-North area, was recommended to the minister of forests. We welcome your views on this proposal, which you can supply as part of your comments on this discussion paper.

## A First Nations' interests

To date, the Nisga'a Tribal Council have been involved in the Timber Supply Review in the Kalum-North area in partial accordance with their Interim Protection Measures Agreement with Canada and British Columbia. Section 8.4 of this agreement states, in part, that:

*The chief forester will promptly initiate a timber supply review for the North portion of the Kalum Timber Supply Area... for the purpose of determining the allowable annual cut pursuant to Section 7 of the Forest Act... The Nisga'a Tribal Council may, at its discretion, appoint a representative to participate as a full member on the timber supply review team...*

The Nisga'a Tribal Council believe they were not given adequate opportunities to fully participate on the timber supply review team. For this reason, the Nisga'a views on current forest management practices, and their impacts on the timber supply, are presented in an appendix to this paper. The information in this appendix does not necessarily represent the views of the Forest Service.

## 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 at least every five years after this review is completed to incorporate new information, new practices and new government policies. Implementation of major government initiatives such as the Forest Practices Code, 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 allowable annual cut can be reviewed in less than five years.

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-North Timber Supply Analysis Report*; TSAR-Addendum is the *Kalum-North Timber Supply Analysis Addendum*; and, SEA is the *Socio-economic Assessment of Timber Supply Options for the Northern Portion of the Kalum TSA*).

## Overview of the Kalum-North area

### Location

The Kalum-North area includes 1,665,000 hectares in the northern portion of the Kalum Timber Supply Area in northwestern British Columbia, encompassing the Bell Irving and Nass River watersheds (see map on the cover). The Kalum-North area is administered by the Kalum Forest District office in Terrace and a field office in Stewart.

The Kalum-North area comprises lands within the Kalum Timber Supply Area that were formerly within Tree Farm License 1, as well as the Upper Nass and Bell-Irving units which were under Forest Service management. Forest licenses\* were awarded in 1985 and were later restricted to the Kalum-North, offering no harvesting rights in the southern part of the Kalum Timber Supply Area. This is the reason that a separate, northern timber supply area has been proposed.

### Communities

There are no timber processing facilities or major communities within the Kalum-North. A region including Stewart, Terrace, Prince Rupert, Kitimat, the Hazeltons, and Kitwanga was defined for the socio-economic analysis. These communities have a combined population of 57,640 (1991 census) and are the major population centers in the adjacent areas. Most of the timber harvested in the Kalum-North area is processed in, or exported from, these communities. (SEA pp. 13-15)

The native communities in the adjacent area include Lakalzap, Gitwinksihlkw, New Aiyansh, Kitwancool and Gitwangak. These native communities do not receive significant economic benefits from timber harvesting and processing

# Kalum-North Area of the Kalum Timber Supply Area

activities, although there is some native involvement in the local forest industry. (SEA pp. 16-18)

The Nisga'a, Gitksan and Gitanyow Tribes have submitted land claims over the Nass watershed. The Nisga'a Tribal Council is presently negotiating a comprehensive land claim with the governments of British Columbia and Canada.

## Employment and industry

Logging is the leading industry in the Kalum-North although no timber processing facilities exist in this area. Timber harvested from the area is processed in five sawmills and two pulp mills in adjacent communities. Some of the harvest is transported to the lower mainland for processing and some is exported from Stewart to overseas markets. There are plans to construct an additional pulp and paper mill and a sawmill in nearby communities. (SEA pp. 13-16)

Of the present allowable annual cut of 1.25 million cubic metres, 79 per cent is harvested by four licensees. An additional 16 per cent is harvested through the Small Business Forest Enterprise Program. Five per cent of the allowable annual cut is held in a reserve and has not been harvested in the past. (SEA pp. 8-9)

Forest licensees in the Kalum-North area are permitted to export timber to offshore markets. Although the annual export has historically been less than 20 per cent of the allowable annual cut, this revenue offsets the lower revenue from pulpwood sales. Recent sawlog demand within the region has resulted in increased log flow to local sawmills and pulpmills outside of the Kalum-North area. This local demand may increase if the allowable annual cuts in surrounding timber supply areas or tree farm licences are reduced.

While there is significant economic activity outside the forest sector (i.e. tourism, fisheries, mining), forestry is the leading contributor to the regional economy. It is estimated that harvesting and processing timber from the Kalum-North area directly accounts for 493 person-years of employment in the region, about 20 per cent of the industrial forest sector employment. (SEA p. 31 and 33)

Tourism accounts for seven per cent of the combined labour force in Terrace, Stewart and the Hazeltons. Spectacular scenery and recreational opportunities such as hiking, fishing and camping are

encouraging growing numbers of tourists to travel Highway 37 to the Yukon. Back-country tourists are attracted by the area's abundant fish and wildlife resources and to its scenic mountains and glaciers. The future may see increased development of tourism facilities and a growing awareness of recreation opportunities within the region. (SEA p. 10)

## Forest inventory

A forest inventory, which provides updated maps and forest statistics for the area, was completed for most of the Kalum-North area in 1991. This inventory indicates the area covers 1,665,000 hectares, 42 per cent of which is forested. Based on current forest management practices, only 14 per cent of this area, or 267,236 hectares, is suitable for commercial timber harvesting. This area is further reduced to 242,917 hectares when logging roads that will be constructed in the future are removed from the productive land base (Figure 2).

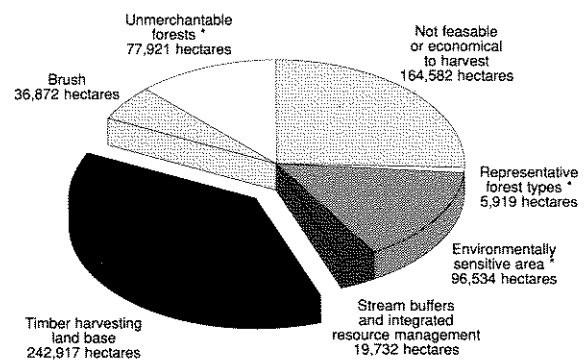


Figure 2. Crown forested land base classification (TSAR p. 6)

**Notes:** Areas being reviewed under the Protected Areas Strategy are included in the timber harvesting land base in Figure 2.

An asterisk indicates the terms are included in the Definitions.

Forests in the Kalum-North are comprised mainly of mature hemlock and balsam stands. Generally, the wood quality is poor and of low commercial value. Figure 3 shows the area occupied by the leading tree species in the timber harvesting land base.

# Kalum-North Area of the Kalum Timber Supply Area

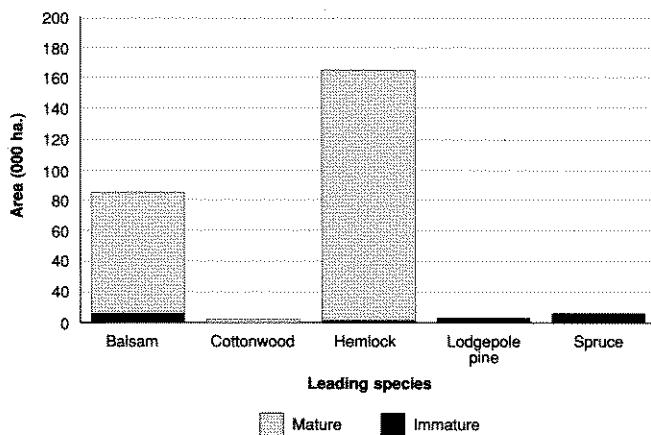


Figure 3. Area occupied by the leading tree species in the timber harvesting land base (TSAR p. 7)

**Note:** Maturity is defined as 80 years or older for pine and 120 years or older for other coniferous species.

## Current resource management practices

Public forest lands in British Columbia provide recreational enjoyment, wildlife habitat, water supplies, wood fibre, and many other benefits. The Forest Service manages the timber, 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 the existing land-use designations and current management practices—the practices that were actually being approved and implemented in the Kalum-North area when the analysis data was generated. Future changes to land-use designations or management practices may result from initiatives such as the Protected Areas Strategy, the Forest Practices Code or Land and Resource Management Plans. These changes will be addressed in the next assessment of the timber supply.

Current management practices are outlined below:

**Integrated resource management** - The *Interim Timber Harvesting Guidelines for the Interior Portion of the Prince Rupert Forest Region* and the *B.C. Coastal Fisheries/Forestry Guidelines* guide forest management practices in the Kalum-North area. Integrated resource management is the foundation of these guidelines.

These guidelines are designed to protect sensitive habitats for fish and wildlife and help ensure soil stability and water quality. To conserve biological diversity, the guidelines require at least 12 per cent of representative habitats be maintained in old growth, which is generally defined as forests older than 140 years. Harvesting will not occur in any representative areas including environmentally sensitive areas, stream-side buffers, non-merchantable forest types, and low-elevation areas that are not feasible or economical to harvest.

**Harvesting** - Harvesting occurs on a three-entry system, where approximately one third of the timber harvesting land base within a defined area may be harvested at any one time. To manage for wildlife habitat, soil, water quality and quantity, biodiversity and aesthetics, areas adjacent to harvested cutblocks are not permitted to be harvested until the trees in the logged areas have grown to at least three metres tall. This delay allows for establishment and regeneration of seedlings and reduces the environmental impacts associated with large, continuous clearcuts. Clearcut size is currently restricted to 40 to 60 hectares on average, unless larger openings are justified to address events such as epidemic insect infestations.

**Silvicultural practices** - By law, basic silviculture is a responsibility of forest licensees and includes all silviculture activities required to produce a new forest of acceptable species on areas that are expected to produce timber in the future. Areas that are presently being logged will be reforested in four to six years; areas that were logged before 1987 will be reforested within 20 years.

**Fish habitat** - Riparian\* habitats are given special attention through stream-side buffer areas of unharvested trees that are designed to protect streams and other non-timber values. Buffer widths range from 20 to 75 metres on both sides of streams depending on the stream's classification (the B.C. Coastal Fisheries/Forestry Guidelines class streams according to their importance to fish). Special management practices from the Nass West Total Chance Plan and the Kwinageese Integrated Resource Plan are the basis for harvesting practices in these areas. (TSAR p. 39)

**Recreation management** - Through its recreation program, the Forest Service is responsible for forest recreation, landscape, and wilderness management on Crown lands. There are currently two areas protected from harvesting within the Kalum-North area: Meziadin Lake Provincial Park and Swan Lake-Brown Bear Wilderness Area—which make up less than one per cent of the timber harvesting land base. Two additional areas, Hanna Ridge and Damdochax Lake—are currently being studied under the Protected Areas Strategy.

# Kalum-North Area of the Kalum Timber Supply Area

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**Visual landscape management** - Maintaining scenic quality by minimizing the impact of changes in the viewsapes along major highway corridors and near recreation and heritage trails is important to the tourism industry in the region. As part of the current guidelines, visual-quality objectives have been recommended along Highway 37. These guidelines are designed to minimize the visual impacts of logging.

**Forest protection** - The primary fire management objective is to protect all resources from wildfires and to reduce losses by preventing human-caused wildfires. In the Kalum-North area, the average timber volume lost to fires is 50,000 cubic metres per year, but about half of this volume can usually be salvaged for processing.

It was estimated that over the next 50 years, about half of the lodgepole pine volume in the Kalum-North area could be lost to the mountain pine beetle. This means that about 3,000 cubic metres of lodgepole pine could be lost annually over the next 50 years.

## Current timber supply commitments

Prior to 1985, logging in the Nass watershed was limited to scattered operations on tree farm license 1 near Meziadin Lake, the Van Dyke area, the Cranberry River area, and in the Kinskuch and Hecate Blocks.

In 1983, the Ministry of Forests approved the tree farm licensee's request that part of the area now known as the Kalum-North be removed from tree farm License 1 and managed as part of the Kalum Timber Supply Area.

In 1985, forest licenses were awarded to allow one million cubic metres to be logged annually from the Kalum-North area. These were referred to as liquidation licenses for the purpose of converting forests of low timber quality into managed or rehabilitated forests. Stumpage rates were set at about \$0.25 per cubic metre of timber harvested. Appraisal procedures for stumpage rates have changed since that time. In addition, 250,000 cubic metres of allowable annual cut were allocated to the Forest Service Small Business Forest Enterprise Program.

Construction of a wood processing facility is now a requirement of each license that was granted during this period, unless the licensee is given an exemption. For licensees without a processing facility, the deadline for construction or exemption is still a few years away.

In 1988, 50,000 cubic metres of the Small Business Forest Enterprise Program allocation was re-apportioned as a forest license and awarded to Zaul Zap Logging Ltd. (now called Sim Gan Forest Corporation). Sim Gan Forest Corporation is managed by the Gitwinksihlkw Band, which is part of the Nisga'a Nation.

Since 1988, 63,300 cubic metres of the forest license volume has been placed in a Forest Service Reserve.

## Timber supply forecast and impacts

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### Timber supply forecast

To complete a timber supply analysis for this review, a computer program was used to generate a base case\* timber supply forecast for the Kalum-North area which met each of the following conditions:

- it maintained the current allowable annual cut as long as possible; then,
- it reduced the harvest rate within a defined range, usually eight to 12 per cent per decade, until the long-term harvest level was reached; and then,
- it maintain harvest levels at or above the predicted long-term sustainable level.

If a timber supply forecast could not be generated that met all these conditions, the analyst adjusted the conditions until a feasible forecast could be produced. These conditions were met to produce a base case timber supply forecast for the Kalum-North area, given current management practices and the best available information at the time.

**It is important to note that the timber supply forecasts presented in the analysis reports and in this paper do not represent either a short-term allowable annual cut determination or a long-term strategy to adjust harvests to sustainable levels. These forecasts are part of the information that will be used by the chief forester to determine the allowable annual cut for the next five years.**

The *Kalum-North Timber Supply Analysis Report* was released in February 1993. Since then, changes to the computer program used to estimate timber volumes have resulted in increased volume estimates for the major tree species in Kalum-North, and, for the most part, lower estimates for minimum harvest ages. Since these changes are now the provincial standard, the analysis was redone, and the *Kalum-North Timber Supply Analysis Addendum Report* was produced in August, 1993. All the timber supply analysis results mentioned in this report are from the *TSAR-Addendum*.

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The analysis projected that the present allowable annual cut can be maintained for 30 years, followed by a decline of 10.5 per cent per decade until the long-term harvest level of 410,000 cubic meters per year is reached 120 years from now (Figure 4).

An alternative harvest forecast that was not analyzed was suggested by the Nisga'a. They called for an immediate and significant reduction in harvest levels as well as an increase in minimum harvest ages to the age of old-growth trees. The Nisga'a believe this strategy will reduce the need for future reductions and produce larger and better quality wood than wood processed from younger forests. However, this strategy could result in a lower long-term harvest level because the trees would be harvested long after they reached their maximum growth rate.

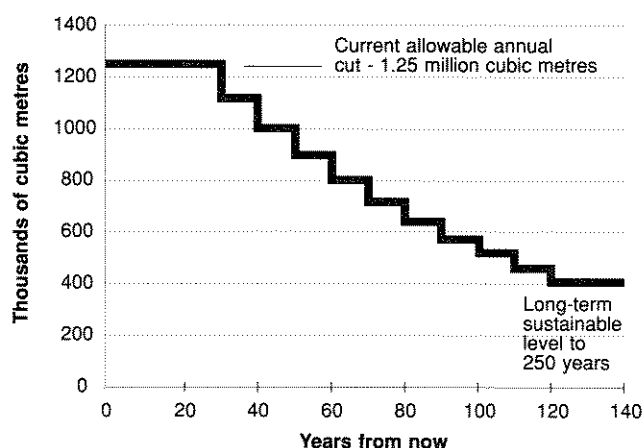


Figure 4. Base case timber supply forecast (TSAR- Addendum p. 4)

- This is not the only pattern that can be chosen to adjust the timber supply in the Kalum-North area:
- the allowable annual cut could be maintained at the present level beyond 30 years, requiring severe declines in the future;
  - small reductions could be implemented now, with larger declines in the future;
  - a consistent level of decline could occur throughout the transition period; or,
  - larger reductions could be made now, with smaller declines in the future.

**The chief forester must decide what the short-term allowable annual cut should be as part of a strategy to achieve the long-term harvest reduction.**

## Social and economic impacts

The Socio-Economic Assessment identifies impacts arising from changes in timber supply. This report—which uses information from the original Timber Supply Analysis Report—indicates that the forest industry generates more economic benefits than other industries in the region.

The assessment found that overall forest sector employment will decline as the supply of wood fibre reduced. In the wood processing sector, this decline will be compounded by ongoing labour-saving technological changes. However, there may be a short-term increase in harvesting employment as cable and hand-felling systems are used more extensively (Figure 8).

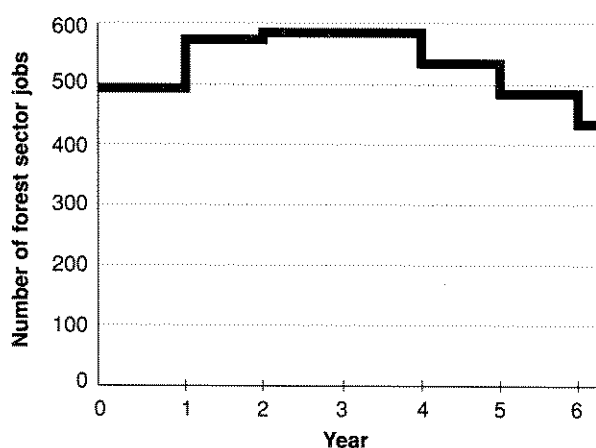


Figure 5. Regional forest sector employment impacts (SEA p. 52)

**Note:** These estimates include direct and indirect person-years\* generated within nearby communities.

The number of person-years have been estimated from values in the SEA.

Although forest industry job losses may be partially offset by projected growth in the tourism and recreation sectors, a decline in employment, income, and provincial revenue as a result of timber supply reductions is expected in the region. (SEA pp. 50-51) If the base case forecast were implemented, the following losses are projected by year 60:

- 79 person-years of regional employment and 109 additional person-years of employment outside of the region;
- \$2.7 million of income within the region and an additional \$3.2 million throughout the remainder of the province; and,
- \$1.7 million provincial revenues.

**Note:** These values were estimated from values in the SEA (pp. 52-53).

# Kalum-North Area of the Kalum Timber Supply Area

The revenue losses, which are directly attributable to a reduced harvest level, would be caused by losses in provincial stumpage, less personal and corporate income tax collected, and reduced sales tax collections. These estimates were developed before the new Forest Renewal Plan was announced and do not include the increased stumpage revenues that will be generated from this plan. While stumpage revenues are expected to increase by as much as 80 per cent, it will not be possible to accurately estimate the impact of this change until the new policy has been implemented for a period of time.

## Examining critical factors

This section identifies critical factors that require special consideration during the allowable annual cut determination for the Kalum-North area of the Kalum Timber Supply Area.

When the Timber Supply Analysis Report and the Addendum were completed in 1993, the potential impact of different assumptions on the timber supply forecast was tested by changing the values for certain critical factors in the analysis. Some of these factors changed the timber supply forecast greatly, particularly in the short term (the next two decades).

Since the analysis, Forest Service staff have further investigated the assumptions that caused changes in the timber supply forecast, as well as other critical factors. Their perspectives are outlined in the following discussion. Other factors in the data package were tested and are discussed in the Timber Supply Analysis Report and the Addendum but were not considered critical to this review and therefore are not included in this discussion paper.

When reviewing these factors, readers should bear in mind that the Socio-Economic Assessment assumes that a change in the timber supply would create economic impacts that are closely related to the size of the timber supply reduction or increase (i.e. a 10 per cent increase in timber supply would result in a 10 per cent increase in forestry employment).

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

## 1. Timber harvesting land base

The most significant factor affecting the short- and long-term harvest levels for the Kalum-North area is the amount of land that is available, feasible and economical for timber harvesting. Determining the long-term timber harvesting land base is difficult because of changing markets, technology and social values. The following potential changes to the timber harvesting land base may impact the results of this analysis:

- **accessing the Upper Nass area**

In the TSAR- Addendum, it was assumed that road and bridge construction would be completed to access the Upper Nass for harvesting in 30 years. According to the timber supply analysis, as long as this area is accessed within 80 years, the timber supply forecast is not affected. However, the longer the Upper Nass is deferred from harvest while still remaining in the timber harvesting land base, the more future harvesting will have to be concentrated in the area when it is accessible. The difficult road construction conditions and severe climate in the area may mean that harvesting in the Upper Nass will be uneconomical in the long term.

The Upper Nass includes 16 per cent of the timber harvesting land base (*TSAR-Addendum p. 13*) (see map on the cover) and approximately 20 per cent of the existing mature timber volume. If this area were excluded from the timber harvesting land base, the impact on the timber supply would be similar to a 20 per cent reduction in existing mature timber, which is illustrated in Figure 6.

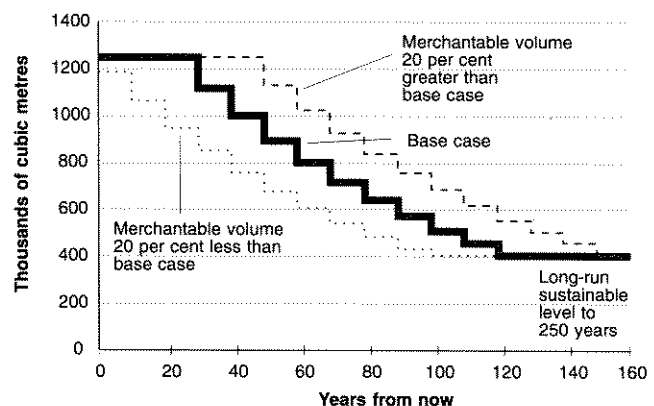


Figure 6. Impact of changing the estimate of merchantable timber volume in the Kalum-North area (*TSAR-Addendum p. 6*)

# Kalum-North Area of the Kalum Timber Supply Area

- expanded use of cable harvesting systems**  
 In the Kalum-North area, cable harvesting systems will be required on approximately 35 per cent of the timber harvesting land base because of steep slopes. On a further 23 per cent, a combination of ground and cable systems may be required. For economic reasons, ground skidding systems have been favoured over cable systems in the past, but cable system use is gradually increasing in the area. If cable systems prove to be uneconomical in some portions of the area, the timber harvesting land base, and consequently the timber supply, will likely be reduced.
- removing the Hecate portion of the area**  
 The Hecate portion of the Kalum-North area (see map on the cover) is expected to be excluded from the proposed Nass Timber Supply Area because this land base currently contributes to the allowable annual cut for the Kalum South area. This will reduce the available timber supply by approximately one per cent.

In contrast, it may be possible to partially offset possible reductions in the short-term timber supply by increasing the timber harvesting land base by:

- implementing partial-cutting harvesting practices consistent with the *B.C. Coastal Fisheries/Forestry Guidelines* in stream-side zones that currently are not harvested;
- harvesting timber in areas determined to be unavailable for harvesting because of physical or environmental factors; and,
- harvesting lower-elevation sites that currently are not economical or feasible to harvest.

## 2. Guidelines to protect non-timber resources

Forest cover requirements are used in timber supply analyses to define forest conditions that will meet integrated resource management guidelines. These requirements define the maximum amount of area that can be harvested and regenerated with young forests in a defined area at any one time, and the minimum height and age of the regenerated forests before the adjacent areas can be harvested (green-up\* age).

In the timber supply analysis for the Kalum-North area, a maximum of 40 per cent of the timber harvesting land base within a defined area was permitted to be harvested at any one time. These areas were required to be at least three metres tall, which was estimated to be achieved in 15 to 20 years after harvesting, before adjacent areas were considered available for harvesting. These

requirements did not affect the projected timber supply in the short or long term.

However, recent operational plans and studies suggest that these forest cover requirements may not meet the current integrated resource management guidelines for the area. (*TSAR-Addendum* p. 10) Figure 7 shows the effect on timber supply if:

- the estimated time for forests to reach three metres tall after harvesting is increased by five years; and,
- the maximum area harvested within the land base in a single entry is reduced from 40 per cent to 25 per cent.

The timber supply forecast for these requirements follows the base case forecast for the first 10 years. In the second decade the timber supply is projected to decline to 17.7 per cent below the base case. The remainder of the forecast is the same as the base case. An alternative timber supply forecast is to implement a nine per cent reduction immediately, returning to the base case forecast after 20 years.

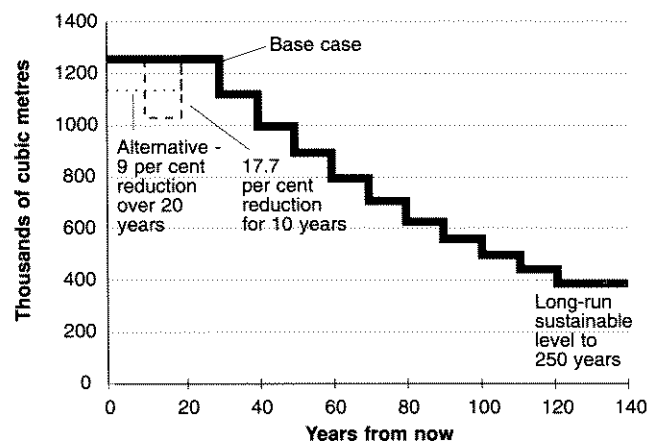


Figure 7. Impact of changing forest cover requirements

A recreation inventory is currently being completed for the Kalum-North area which will identify viewscapes that require special management practices to meet visual quality objectives. As these objectives were not available when the timber supply analysis was completed, they were not included in the analysis. Because visual quality objectives limit the amount of area that can be harvested at any one time, and require an increased length of time before adjacent stands can be harvested, they often impact the timber supply.

# Kalum-North Area of the Kalum Timber Supply Area

It is expected that approximately 10 per cent of the timber harvesting land base will be subject to visual quality objectives, and these areas will require similar or possibly greater forest cover requirements than were used to produce the timber supply forecast in Figure 7. The impact of these requirements will be less than predicted in Figure 7 because only 10 per cent of the land base is expected to be included in the visually sensitive area.

### 3. Amount of merchantable timber in the existing mature forests

A factor affecting timber supply forecasts for the Kalum-North area is the estimate of the amount of merchantable timber in the existing mature forests that are available for harvest. Changing these estimates by 20 per cent has a significant impact on projected harvest levels over the next 20 to 30 years (see Figure 5). The estimated timber volume in each mature, harvestable forest stand directly effects how long the current harvest can be maintained and the period of decline to the long-term harvest level.

Kalum Forest District staff believe the timber volumes for existing mature stands used in the base case may be over-estimated by as much as 10 per cent. (TSAR p. 17) Field sampling is underway to improve the reliability of the volume estimates used in the forest inventory for this area.

### 4. Future forest productivity

The timber supply analysis for the Kalum-North area projects an average annual growth rate of 1.8 cubic metres per hectare per year for the area, which is low compared to adjacent areas. Ongoing field assessments will improve these estimates and may support higher growth estimates for naturally regenerated stands. Productivity estimates for managed stands (areas that have been planted and tended) may be even higher.

A test completed in the timber supply analysis showed that even if second-growth stands actually yield 50 per cent more timber and minimum harvest ages are 10 years younger than estimated in the base case, the timber supply forecast would still follow the base case for 90 years. While the long-term timber supply would be 50 per cent higher than estimated in the base case, or 628,000 cubic metres per year, the increased yields would not affect the projected timber supply for the next 20 to 30 years (Figure 8).

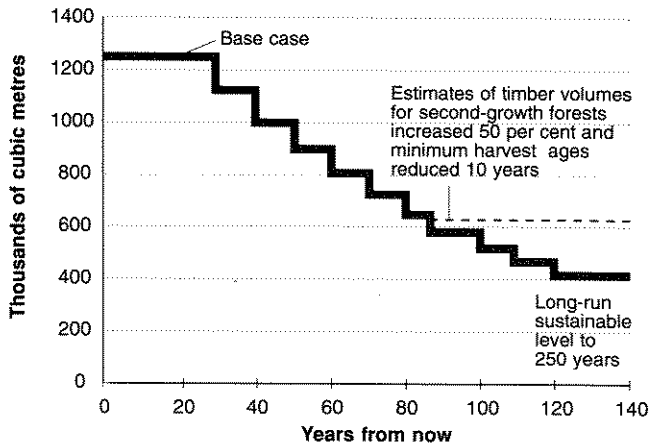


Figure 8. Impact of changing estimates of timber volumes for second-growth forests (TSAR-Addendum p. 9)

### 5. Social and economic impacts

The communities in the region, particularly Stewart, are highly dependent on the forest sector. A continuing timber supply is critical for stable employment and investment in the regional economy as the service and tourism sectors are not expected to replace the forest sector as the regional employment leader in the foreseeable future. (SEA p. 42)

The following alternatives within the forest sector may potentially offset the economic impacts of any timber supply reductions in the Kalum-North area:

- a province-wide shift to value-added manufacturing to make the best possible use of the available timber resources and create more employment by reducing forest industry dependence on cyclical markets for commodity grades of pulp, newsprint and lumber;
- a growing domestic and foreign demand for pulp and paper products; and,
- an increased demand for pulp chips, allowing profitable whole log chipping of presently unused fibre.

The Forest Renewal Plan may also create employment and investment opportunities in the area.

### Your input is needed

The allowable annual cut is an important determination requiring well-informed and thoughtful public input. We ask that you answer the questions on the response form at the back of this paper and send it to the forest district manager at the address below. We encourage you to add any

# Kalum-North Area of the Kalum Timber Supply Area

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additional comments that you feel are relevant. If you prefer, additional comments or a detailed submission can be written on separate pages.

Feedback is welcomed on any aspects of this discussion paper, the Timber Supply Analysis and Addendum Reports, and the Socio-Economic Assessment Report and other topics related to the timber supply in the Kalum-North area of the Kalum Timber Supply Area. Forest district staff would be pleased to discuss questions or concerns which 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 October 20, 1994.

You can identify yourself on your response if you wish. If you do, you are reminded that responses may be made public as required under the *Access to Information Act*. The identity of respondents will be confidential if this occurs.

Public input will be collated and summarized, then submitted to the chief forester and the minister of forests. The summary will assist the minister in providing direction to the chief forester in accordance with the provisions of Section 7 of the *Forest Act*. The chief forester will consider any of the comments which pertain to technical matters under his direct mandate. A summary of public input will be available from the district manager.

For more information contact:

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Collier Azak  
Nisga'a Tribal Council  
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Fax: (604) 633-2367



## Appendix Nisga'a Section of the Kalum-North Discussion Paper

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The information in this appendix represents the views of the Nisga'a Tribal Council

### Why is there a Nisga'a Appendix?

Under the "Interim Protection Measures Agreement" entered into between the Nisga'a Tribal Council, British Columbia, and Canada on July 31, 1992, the Nisga'a is entitled to participate as a full member of the Kalum-North Timber Supply Review Team. For reasons beyond our control the Nisga'a Tribal Council has been unable to participate as a full member of the review team. Our statement here is the result of negotiations with the Ministry of Forests about our dissatisfaction with the ministry's efforts to include us as effective members of the team.

From the beginning of the Timber Supply Review process, we have been dissatisfied with the nature of the review. Our concerns have included:

1. Fundamental assumptions in the ministry's model show that the current allowable annual cut is about three times above sustainable levels. Nevertheless, the model assumes that current cutting rates will be maintained as long as possible, and reduced as little as possible, as infrequently as possible! The option of a determined and reasonable reduction to sustainable levels is not considered because of the decision to base the review on "current forest management practices." However, the Nisga'a believes that "current forest management practices" have led to the over-cutting that now threatens the sustainability of communities in northwestern B.C.
2. The technical assumptions of the Timber Supply Review that have large influences on the determination of cutting rates were decided without Nisga'a participation. These include the quantity and quality of standing timber, the operable area (i.e. the area available for logging), the length of time to satisfactorily regenerate a logged area, and measures to protect fish, wildlife, water, and soil. We believe that many of these assumptions are unfounded and inaccurate.
3. Our technical assumptions were not tested in a computer run of the timber supply model. Accordingly, the Timber Supply Review does not enable a comparison of the results of the different and, we believe, more accurate assumptions. We elaborate on these technical concerns below.
4. We were not involved with the initial data gathering for the socio-economic analysis.

After persistence on our part, some minor information about some Nisga'a needs was incorporated into the socio-economic analysis.

For these reasons, we believe that the Timber Supply Review process, including the timber supply report and the socio-economic analysis, does not provide the chief forester with adequate technical information to use in determining an allowable annual cut for the Kalum-North area. We provide a brief elaboration of some of these concerns below.

# Kalum-North Area of the Kalum Timber Supply Area

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## Appendix (Continued)

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### Timber Supply Analysis:

#### 1. Lack of Information

The Timber Supply Review begins by explaining how poor the information base is for the Kalum-North area. Given the notable lack of information, one would expect that the Timber Supply Review would have erred on the side of caution to ensure a sustainable approach. Instead, the Timber Supply Review is based on assumptions that likely overestimate the volume and quality of merchantable timber, and exaggerate the growth rate of trees following logging. These problems will lead to an unsustainable allowable annual cut.

#### 2. Operable Forest Area

The operable forest area is the amount of forest deemed ecologically appropriate and economically viable to log, and to be ecologically capable of growing repeated timber crops in reasonable periods of time, in perpetuity. The amount of operable forest area is directly proportional to the sustainable cutting rate for a particular forest.

Nisga'a technical analyses, adjacent to and within Kalum-North have determined operable areas that are less than 25 per cent of the operable area estimated by the Ministry of Forests. While we have not calculated the operable area for all of Kalum-North, we believe that our determinations to date are representative, and that our overall operable area for Kalum-North would be 25 per cent or less of the ministry estimates. This means that, other factors being equal, the Nisga'a sustainable cuts would be less than 25 per cent of the long-term level determined in the analysis. A more conservative approach to the protection of ecologically sensitive forests and biological diversity, and the needs of non-timber forest uses are the main reasons for our much smaller operable forest area.

#### 3. Rotation Period

The Nisga'a have estimated that the rotation period (the time to grow merchantable timber following cutting of a forest) for Kalum-North would be approximately 250 years. This is about double the rotation periods of 100-150 years used by the Ministry of Forests for most of the Kalum-North area. Using the Nisga'a rotation period in the model will result in an allowable cut that is approximately one-half or less of an allowable annual cut based on rotations used by the Ministry of Forests.

A longer rotation period is necessary because of the harsh climate in the Kalum-North, which means that trees require longer periods to grow to merchantable size. Without a component of high quality wood, which requires about 250 years to produce, logging activities would not be economical in the area.

#### 4. Current Forest Management Practices

The entire review is based on what the Ministry of Forests refers to as current forest management practices. Abundant scientific information and our own studies tell us that current practices in Kalum-North do not protect future timber productivity, nor do they protect non-timber values.

Problems with current forest management practices that are not considered in the Timber Supply Review include:

- a. **Clearcutting** - Kalum-North is dominated by large clearcuts that have changed local climates, making regeneration of trees difficult. One location in Kalum-North contains a 6,000 hectare (about 15,000 acres) clearcut. One company that was audited by the Ministry of Forests has accumulated nearly 4,000 hectares (about 10,000 acres) of not satisfactorily regenerated logged area in about five years. The company plans to

# Kalum-North Area of the Kalum Timber Supply Area

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## Appendix (Continued)

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regenerate this area to regional stocking standards within the acceptable regeneration delay period, but we feel there will be shortfalls in regeneration attempts and their total NSR area will continue to increase as the company continues to clearcut.

Cycles of clearcutting do not retain the large snags and fallen trees necessary to replenish forest soils, store and filter water, and provide essential animal habitat. The main damaging effects of large-scale industrial clearcutting are not considered in the Timber Supply Review.

- b. **Timber Utilization** - Considerable merchantable timber is currently wasted in logging operations in Kalum-North. The Ministry of Forests performs surveys to measure wasted merchantable timber and as a result of these surveys includes the wasted timber as part of the annual allowable cut. In some cases, to determine all of this waste with waste and residue surveys is impossible. This unaccounted for waste means that timber companies cut more forest area in order to obtain their allowable annual cut, and eventually means that cutting rates will not be sustained. This wasted volume was not included in Timber Supply Review assumptions.
- c. **High Levels of Soil Degradation** - Poorly located, constructed, and maintained logging roads, landings, and skid roads have led to high levels of soil degradation. The Timber Supply Review does not adequately consider the levels of soil degradation found in much of Kalum-North.
- d. **Water and Fish Habitat Damage** - Logging in Kalum-North has been carried out immediately adjacent to water courses and wetlands of all sizes and, in some cases, logging machinery has been operated through water courses. While some of these water courses do not contain fish, all of these streams, creeks, and wetlands must be protected, because they furnish high quality water to downstream fish bearing waters.

### 5. Ecologically Sensitive Forests

A significant portion of the forests found in Kalum-North are snow dominated, with long, cold winters characterized by deep snow packs of as much as three metres or more. These conditions make the survival of young trees very difficult. In natural situations, trees in these forests regenerate within the shelter of the canopies of large trees. Regeneration is intermittent and growth is slow.

Clearcutting, the only logging practice used in the area, increases snow packs by about 30 per cent, because there is no longer a tree canopy to catch snow and evaporate it back into the atmosphere. As well, clearcutting creates colder conditions, because the clearcut area is exposed to the full force of the elements. These conditions following logging in the Kalum-North have resulted in regeneration failures and in poor overall regeneration success.

Substantial parts of Kalum-North forests are found on strongly broken topography with steep side slopes and shallow soils. Due to the nature of the topography it will be difficult to log economically and still protect the sensitivity of these easily degraded forests. In some instances, these areas are too sensitive for any logging and road construction to occur. However, these types of sites are included within the timber cutting land base in the Timber Supply Review. This will continue to result in damage to non-timber and timber resources, and will result in overstating the allowable annual cut.

### 6. Timber Supply Review Forest Model

Forests are webs of interacting, interdependent processes. Therefore, when people modify forests through management practices, one management activity has impacts on many related forest processes that are ultimately responsible for maintaining forest functioning.

# Kalum-North Area of the Kalum Timber Supply Area

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## Appendix (Continued)

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The Timber Supply Review model does not test for cumulative effects of groups of activities of timber supply assumptions working together. This problem leads to oversimplifying the impacts of groups of management activities and timber supply assumptions in the Sensitivity Analysis. The ultimate result of this problem will be forests that do not behave the way predicted by the model and, we believe, an unsustainable timber cutting rate.

### Socio-Economic Analysis:

The socio-economic analysis considered only one approach for the society and economy in the region of Kalum-North: status quo timber extraction. Thus, this document gives the impression that there is really only one option to maintain the social and economic fabric of the region. As such, this assessment provides little useful analysis to develop a sustainable economy and society for the region.

Some important social and economic options that were not considered include:

- establishing value added wood manufacturing facilities closer to the forest in Kalum-North.
- marketing and developing large-scale, and/or diverse small-scale ecotourism based on the substantial wilderness values remaining in Kalum-North. If the annual allowable cut is not reduced significantly, these options will be all but lost in the next five years before the next Timber Supply Review is carried out.
- organizing cooperative approaches to diverse development of the region that involves a mix of people and organizations. Sometimes what one organization or individual is unable to develop technically and financially, a group of individuals and organizations are able to achieve by working together. The Nisga'a wishes to establish and participate in this kind of cooperative approach.
- establishing a timber industry based around the production of high quality old growth wood, using partial cutting systems instead of clearcutting.

An effective social and economic analysis must include cost-benefit analysis to compare options using total cost accounting which compares all of the costs and all of the benefits for each option. In total cost accounting benefits are assigned to clean air, pure water, and other aspects of a clean environment, while costs are assigned to environment degradation.

The Nisga'a believe that the first step in developing a sustainable approach is to choose a social and economic option that is based upon maintaining fully functioning forests at all scales. A timber supply review would follow and take direction from this first step. This is in contrast to the existing Timber Supply Review, which assumes that the status quo timber-based economy is the only option, without serious concern for other alternatives.

# Kalum-North Area of the Kalum Timber Supply Area

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## Appendix (Continued)

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### Questions for Discussion

The questions here are to encourage constructive discussion about the timber supply review for the area, and to stimulate the reader to communicate your views about timber supplies and forest use in the Kalum-North to: Kalum District, Ministry of Forests, and the Nisga'a Tribal Council.

A. Whose needs are addressed with the approach taken by this Timber Supply Review?

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B. Will "current forest management practices," as defined by the Ministry of Forests sustain the forest in the Kalum-North? Will they sustain the societies and economies that depend upon the forest? For how long?

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C. How do we move from today's economy and social structure in Kalum-North to a more diverse, sustainable economy and social structure?

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D. Shouldn't we consider reducing our logging to sustainable levels now rather than leave the problem to our children, and theirs?

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In responding to these questions, you may simply refer to them by letter without restating them. Any other comments, perspectives, or suggestions are most welcome.

**Mail your comments to:**

Collier Azak  
Forester  
Nisga'a Tribal Council  
P.O. Box 231  
New Aiyansh, B.C.  
V0J 1A0  
Phone: (604) 633-2601  
Fax: (604) 633-2367

Copies of your response  
will be provided to the  
Kalum Forest District  
manager.



# Kalum-North Area of the Kalum Timber Supply Area Timber Supply Review

## Discussion Paper Response Form

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### A. Input on the creation of the Nass Timber Supply Area

The Forest Service has proposed creating the Nass Timber Supply Area including the northern portion of the Kalum Timber Supply Area - the area referred to as the Kalum-North (less the Hecate area) in this paper (see map on front cover). Your comments on this proposal will be considered by the minister before this decision is made.

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### B. Input to the timber supply review

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 licences:

- the rate of timber production that can be sustained on the area;
- the short and long term implications to 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; and,
- 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-North area of the Kalum Timber Supply Area provide information on these factors. We welcome further input from the public to ensure the best available information is used in the allowable annual cut determination. Please provide your comments on this form, or in another format. Input will be accepted until October 20, 1994.

#### 1. Economic and social objectives

Please use the space below to provide comments to the minister of forests regarding the economic and social objectives you believe should be considered in determining the allowable annual cut for the Kalum Timber Supply Area. The minister will consider these comments to define the economic and social objectives of the Crown.

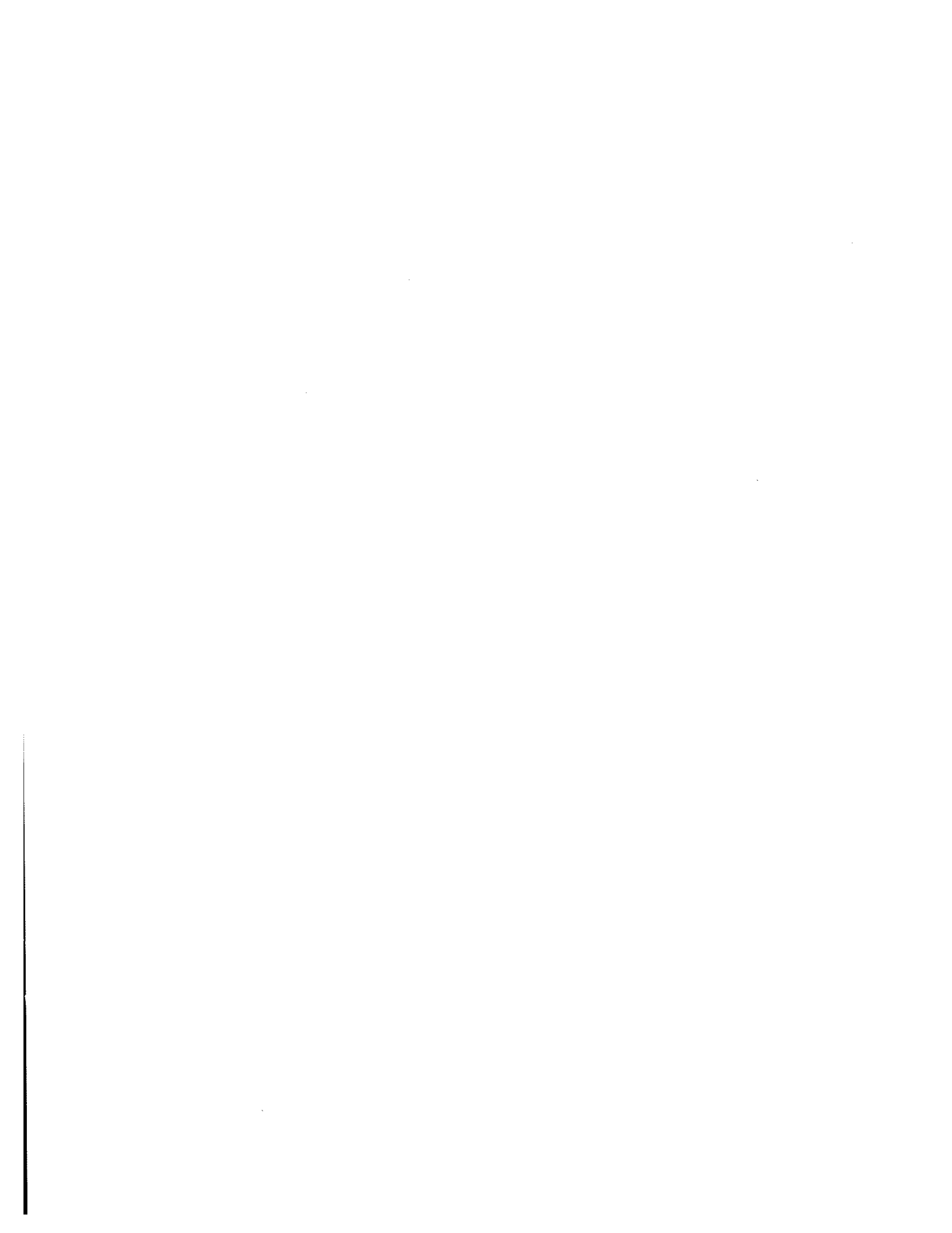
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