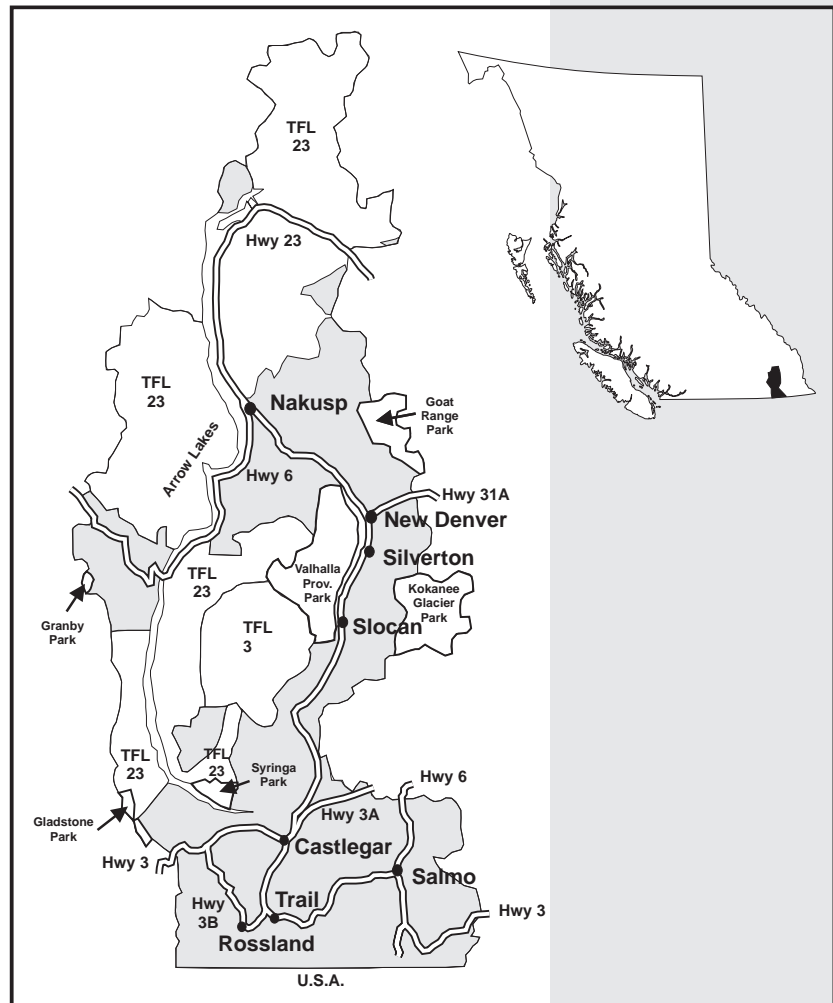


Arrow Timber Supply Area

Information Report

January 1999



Introduction

The British Columbia Forest Service is required by law to formally review the timber supply* in all timber supply areas* and tree farm licence* areas in the province. A review of each of the areas is completed at least once every five years. The main objectives of the five-year reviews are:

- to identify the economic, environmental and social information that reflects the current forest management practices—including their effects on the short- and long-term timber supply
- to identify where improved information is required for future timber supply forecasts
- to provide the chief forester with information to make any necessary adjustments to the allowable annual cuts* for the next five years

*Throughout this document, an asterisk at the end of a phrase or word indicates that a definition can be found in the margin.

Objective of this document

The objective of this document is to provide an opportunity for public review of the draft data and management assumptions that will be applied in reviewing the timber supply for the Arrow timber supply area. This document represents the early stages of the timber supply review process and is intended to provide a non-technical overview of the data and management assumptions that will be used in the upcoming *Arrow Timber Supply Area Analysis Report*.

The *Arrow Timber Supply Area Analysis Report* will be one of the documents that the chief forester will consider in making the allowable annual cut determination under Section 8 of the *Forest Act*. Public input is encouraged to ensure the best

information is used in determining allowable annual cuts.

This report contains a general description of the data assumptions and current forest management practices related to timber supply for the Arrow timber supply area. For the purpose of this timber supply review, current practices can be defined as the set of land-use decisions and forest management practices that are currently implemented and enforced. Future forest management objectives that may be established but are not currently implemented and enforced are not included.

The draft data and management assumptions are summarized on pages six through nine. For a more detailed description of the information, please contact the Arrow Forest District Office (in Castlegar) or the Nelson Forest Region Office (in Nelson) and request a copy of the data package. The public will have 30 days to review and comment on the information report and data package. A response form at the end of this document will assist you in providing your comments. Written comments will be accepted until February 22, 1999.

Timber Supply Review process

In British Columbia, a process for determining allowable annual cuts has been in place since the late 1940s. However, the process has changed significantly since then. More recently, the process has had some minor revisions designed to improve efficiency and encourage earlier public review through the release of this report.

Figure 1 (next page) illustrates the five-step process that has been developed for the Timber Supply Review of timber supply areas. The diagram indicates the current status of the timber supply review for the Arrow timber supply area, and the estimated time required for each step.

Timber Supply Review

in the Arrow TSA

Timber supply

A harvest level that is forecasted to be available over time, under a particular management regime.

Timber supply area

An integrated resource management unit established in accordance with Section 8 of the *Forest Act*.

Tree farm licence

An agreement entered into with the provincial government which provides for the establishment, management and harvesting of timber by a private interest on a defined area of Crown land in accordance with the *Forest Act*.

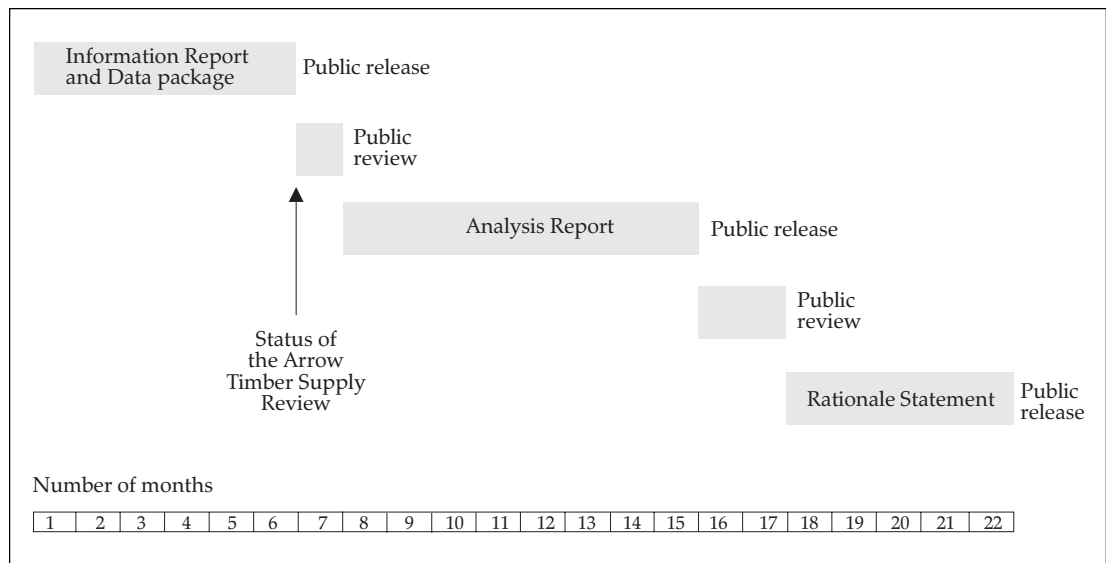
Allowable annual cut

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

Timber Supply Review

in the Arrow TSA

Figure 1.
Review process for the Arrow timber supply area.



The process for reviewing the timber supply and establishing the allowable annual cut for tree farm licence areas is based on similar principles; however, the process takes 30 months from start to completion.

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 economies and environment—now and in the future. Section 8 of the *Forest Act* requires the chief forester to consider the following factors to determine allowable annual cuts for timber supply areas and tree farm licence areas:

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

- constraints on the amount of timber produced from the area due to 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 judgement based on the best available information. Information that is relevant to the factors listed above is provided to the chief forester by government agencies, the minister of forests and the public.

One of the objectives of the Timber Supply Review is to incorporate changes arising from new information, new practices and new government initiatives

that may have an impact on timber supply. In the event of significant change, the allowable annual cut may be reviewed in less than the required five years.

Following the release of the allowable annual cut determination by the chief forester, the minister of forests apportions the cut to the various licences and programs.

Principles of the Timber Supply Review

In determining allowable annual cuts—in addition to the requirements outlined in Section 8 of the *Forest Act*—the following principles have been developed.

The Timber Supply Review:

- is a decision-making process for establishing the allowable annual cut for timber supply areas and tree farm licence areas by the chief forester on a maximum five-year cycle, as required under Section 8 of the *Forest Act*; **it is not a process for making land-use or management decisions**
- incorporates the best information available, including all relevant current practices, and identifies where new information is needed
- reflects the results of implemented plans and land-use decisions, and provides a benchmark for future planning processes
- involves other agencies, affected groups and the public

Kootenay-Boundary Land Use Plan

In 1995, government released the Kootenay-Boundary Land Use Plan which included the creation of 16 new parks. New protected areas within the Arrow timber supply area are Syringa Creek, Goat Range, Gladstone and Granby.

More recently, on July 8, 1997, the Kootenay-Boundary Land Use Implementation Strategy was approved by government. The strategy provides guidelines which integrate timber harvesting and other economic activities with environmental values. It also provides an expression of the government's commitment to achieve the Crown's social and economic objectives for the region, including the Arrow timber supply area.

Land-use planning decisions regarding forest practices which are implemented and protected areas that have final approval from government will be reflected in this timber supply review.

Description of the timber supply area

The Arrow timber supply area is situated in southeastern British Columbia and covers approximately 754,000 hectares. It is bounded by Glacier National Park to the north, the U.S.A. to the south, and the Selkirk and Monashee Mountain ranges to the east and west respectively.

The Arrow timber supply area is administered by the Arrow Forest District office located in Castlegar.

The communities

The Arrow timber supply area includes the communities of Castlegar, Trail and Rossland. The timber supply area also includes the smaller communities of Warfield, Montrose, Fruitvale, Salmo, Slocan, Silverton, New Denver and Nakusp, and several unincorporated areas.

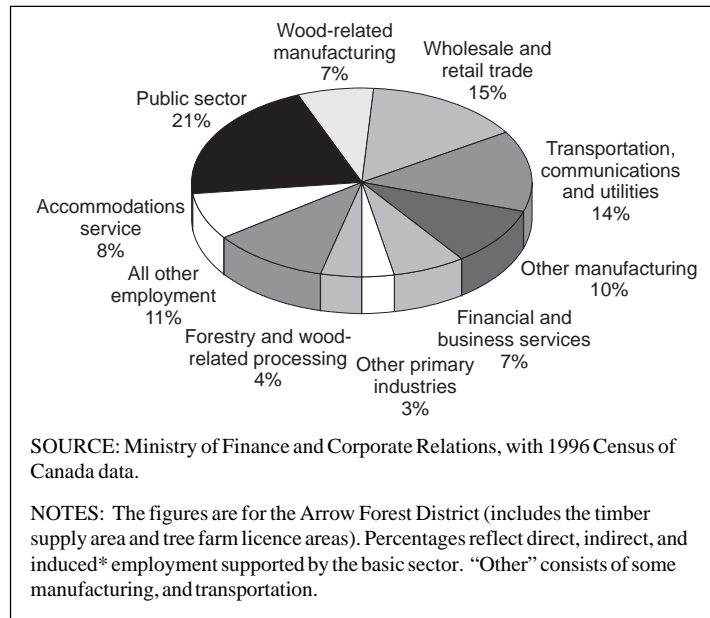
According to the 1996 Census, the population of the timber supply area was 45,755. By 2001, the population of the timber supply area is expected to increase by approximately five per cent.

The economy

The Arrow timber supply area has a resource-based economy with the predominant sectors being forestry and mining. Figure 2 illustrates total employment by industry sector for the area.

The forest sector accounts for more than 15 per cent of the timber supply area's total employment. Forestry employment includes

Figure 2.
Total employment by sector for the Arrow area, 1996.



Induced

Induced employment is generated through the spending of direct and indirect employment income, such as in local retail outlets.

Timber harvesting land base

Crown forest land within the timber supply area that is currently considered feasible and economical for timber harvesting.

timber harvesting, silviculture activity and the manufacturing of wood and paper products at the pulp mill, numerous sawmills, and shake and shingle mills. During 1997 employment at these facilities totalled over 1,250.

Although the forest sector is predominant in the Castlegar-Arrow Lakes area, mining is the leading source of income in Trail and Rossland where the Cominco smelter is the major source of employment. Other important sectors in the Arrow timber supply area are tourism and the public sector.

First Nations

The Ktunaxa, Shuswap, Okanagan and Sinixt First Nations have traditional territories within the Arrow timber supply

area. Currently, there are no First Nations communities in the timber supply area.

The Ktunaxa/Kinbasket Tribal Council has submitted a comprehensive land claim which covers the southeast corner of the province, including part of the Arrow timber supply area. The Westbank First Nation has also entered into land claim negotiations for a portion of the Arrow timber supply area. Once the land claims have been finalized, they will be considered in future timber supply reviews.

All of the First Nations have expressed concerns about timber harvesting in areas with high cultural and economic values. Archaeological overview and impact assessments have been completed for the Arrow timber supply area. This information will be considered in this timber supply review.

The forest land resources

Numerous natural resources are associated with the forest land base. Forest products, recreation and tourism amenities, and a variety of wildlife habitat highlight the wide range of values and uses found in the Arrow timber supply area.

Recreational values and uses of the forests in the Arrow timber supply area are high due to the proximity of provincial and national parks and exceptional natural scenery. The mountainous terrain and lakes provide a wide range of opportunities for recreation including mountain-biking, hiking, camping, boating, heli-skiing, cross-country skiing and snow-mobiling.

The Arrow timber supply area contains abundant water resources. Approximately 80 per cent of the timber harvesting land base* is located within watersheds that are licenced for domestic use.

The environment

There are four biogeoclimatic zones* in the Arrow timber supply area. The distinct ecological features and the unique nature of the area contribute to high biodiversity values.

A wide range of wildlife species inhabit the diverse forests of the Arrow timber supply area, including moose, elk, deer, mountain goat, cougar, small mammals and many birds. Sensitive species include the peregrine falcon, Forster's tern, western grebe, bald eagle, canyon wren, harlequin duck, white-headed woodpecker, badger, bat, grizzly bear, mountain caribou and several fish species, including bull trout.

History of the allowable annual cut

On September 6, 1995, the chief forester set the allowable annual cut at 619,000 cubic metres, unchanged from the previous determination.

As part of the 1995 determination, the chief forester gave direction to resolve uncertainties with respect to the timber supply in the Arrow timber supply area. In preparation for the next allowable annual cut determination, the following issues were to be examined:

- **estimates of existing forest volumes** - at the time of the previous allowable annual cut determination, there was a concern that the existing forest volumes were overestimated.

In April 1997, the British Columbia Forest Service released the final results of an inventory audit which compared actual forest volumes to the projected volume estimates for the Arrow timber supply area. The audit also evaluated the decay, waste and breakage reduction factors for redcedar and hemlock stands that are older than 140 years. The

results of the audit indicated that the volume estimates for existing forest stands are statistically acceptable.

- **estimates of site productivity** - at the time of the last determination there was public concern expressed regarding estimates of site productivity.

Recent results from provincial studies indicate that site productivity in old-growth stands is generally underestimated. Adjustment factors have not yet been developed for the Arrow timber supply area. A sensitivity analysis will examine the potential impact on timber supply from uncertainty regarding estimates of site productivity.

- **distribution of harvesting** - it was noted in the last allowable annual cut determination that harvesting was not well distributed throughout the timber supply area.

Since the last determination, district staff have been reviewing the distribution of harvesting and processes are currently underway to resolve this concern.

- **root-rot disease** - the previous determination noted that there was some uncertainty regarding the impact of *Armillaria* root disease on regenerating forest stands.

There are various root-rot studies underway in the Nelson Forest Region. Any information that is available regarding the impacts of root-rot diseases will be considered in this timber supply review.

Note: For more information on these points, please refer to the Arrow timber supply area Rationale for Allowable Annual Cut Determination, September 6, 1995.

Current timber supply review

Public forest lands in British Columbia provide recreational enjoyment, fish and

Biogeoclimatic zones
A large geographic area with broadly homogeneous climate and similar dominant tree species.

Timber Supply Review

in the Arrow TSA

Integrated resource management

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

Forest Practices Code

Legislation, standards and guidebooks that govern forest practices and planning, with heavy penalties for violators.

Operability

The classification of an area to assess its suitability for timber harvesting.

Environmentally sensitive areas

Areas identified as requiring special management to protect important recreation and scenic values, fisheries resources, sensitive soils and unstable slopes.

wildlife habitat, water supplies, timber resources and many other benefits. The Ministry of Forests manages the timber, range and recreation resources on public lands, while the Ministry of Environment, Lands and Parks is responsible for the management of fish, wildlife, water resources and parks. Both agencies subscribe to the principle of integrated resource management*, where all resources are considered when making forest management decisions.

The Forest Practices Code* is now law and has been fully implemented in the timber supply area since June 15, 1997. The new practices may influence both the short- and long-term timber supply.

The data and management assumptions that will be used in the timber supply analysis will be based on the existing land-use designations and resource management practices that are currently approved and implemented in the Arrow timber supply area. The chief forester will also consider any new information, based on implemented changes, at the time of the allowable annual cut determination.

Draft data and management assumptions for public review

The public is encouraged to review the data and management assumptions for completeness and accuracy. In determining an allowable annual cut, the chief forester will consider these assumptions as required by Section 8 of the *Forest Act*. The following general outline contains *some* of the more pertinent information that will be used in the timber supply analysis and, subsequently, in the chief forester's allowable annual cut determination for the Arrow timber supply area. More detailed information can be found in *Appendix A*:

Data Package. This appendix is available upon request from the Ministry of Forests offices listed at the end of this report.

Land base factors

- **Operable area** - the forested area in the Arrow timber supply area has been assessed for operability* based on economic attributes, timber types and physical accessibility. Only those areas that are considered operable will contribute to the timber harvesting land base.
- **Low productivity sites** - forest types that are not considered fully available for harvesting due to low timber volumes or low projected growth rates are not included in the timber harvesting land base.
- **Problem forest types** - these are forest types that are not currently utilized in the Arrow timber supply area. Generally, these are deciduous stands and pure hemlock and subalpine fir types older than 140 years. They are not utilized due to low merchantability and the high amount of decay. These stands are not included in the timber harvesting land base.
- **Environmentally sensitive areas*** - the forest inventory includes a classification of areas that are considered to be environmentally sensitive. For the Arrow timber supply area these are areas noted for soil and forest regeneration problems, water, wildlife, snow avalanche and recreation.

In community watersheds, all highly sensitive and 50 per cent of moderately sensitive areas will not contribute to the timber harvesting land base. Outside of community watersheds, most of the highly sensitive and about 20 per cent of moderately sensitive areas will not contribute.
- **Forest roads** - separate estimates are made to reflect the loss in productive forest land due to existing and future roads, trails and landings. These

estimates are deducted from the area of productive forest and removed from the timber harvesting land base.

Inventory factors

- **Forest inventory** - the current inventory has been updated to October 1997 to take into account recent harvesting and silviculture activities.

The dominant tree species in the Arrow timber supply area are Douglas-fir, lodgepole pine and western larch. Balsam (subalpine fir), spruce, western hemlock and western redcedar are also common.

- **Minimum harvestable ages** - the minimum harvestable age is the earliest age at which a forest stand is estimated to reach a merchantable size and be considered available for harvest. For the timber supply analysis, the ages are based on achieving a minimum volume of 150 metres per hectare and/or a minimum diameter of 25 centimetres at 1.3 metres above the ground.

Forest re-establishment factors

- **Basic silviculture** - British Columbia laws require that areas that are harvested and expected to produce timber in the future must be reforested with ecologically acceptable species within a specified time frame. The most common silvicultural practice is to harvest; then if necessary prepare the site for reforestation; reforest by planting a mix of species or by relying on natural regeneration; and control competing vegetation.

In the Arrow timber supply area, reforestation is achieved predominantly by planting well-spaced trees of acceptable species. In the timber supply analysis, it is assumed that areas will be reforested two years after harvesting has begun.

Timber utilization factors

- **Timber utilization** - estimates of merchantable volume will be based on the utilization of all trees which meet or exceed the following standards: a minimum 10-centimetre top diameter; a maximum stump height of 30 centimetres; and a minimum diameter of 17.5 centimetres at 1.3 metres above the ground; except for lodgepole pine which is a minimum diameter of 12.5 centimetres at 1.3 metres above the ground.

Infestations, devasations and salvage of timber

Each year, portions of the forests in the Arrow timber supply area are damaged by natural agents such as fire, wind, insects and disease. Some of the damaged timber will not be salvaged due to access and economic limitations or other environmental considerations. The annual unsalvaged volume for the Arrow timber supply area for this timber supply analysis is estimated to be 28,845 cubic metres.

Factors to be considered for purposes other than timber production

Forest management guidelines used to manage forest resources such as biodiversity, scenic values, wildlife habitat and water quality will be included in the timber supply analysis through the use of forest cover requirements, and volume and land-base reductions.

- **Forest cover requirements** - under current forest management practices, cutblocks* must achieve green-up* before adjacent areas are permitted to be harvested. Resource emphasis zones are used to differentiate areas with different adjacency or forest cover restraints. For example, to account for forest cover requirements in the integrated resource management zone, a maximum of 25 per

Cutblock

A specific area, with defined boundaries, authorized for harvest.

Green-up

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

Timber Supply Review

in the Arrow TSA

Riparian habitat

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

Wildlife tree

A standing live or dead tree with special characteristics that provide valuable habitat for conservation or enhancement of wildlife.

Landscape unit

A planning area based on topographic or geographic features.

Seral stages

Sequential stages in the development of plant communities that successively occupy and replace each other over time.

Base case forecast

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

cent of the timber harvesting land base will be allowed to have forests less than two metres tall at any time. As well, considerations for maintaining areas of old-growth forests will be accounted for in the timber supply analysis.

- **Visually sensitive areas** - these are areas where the maintenance of scenic landscapes is a priority for recreation and tourism management. They are often located along highways and recreational waterways. Road construction and logging within these areas are planned and implemented to minimize visual impacts. The current practice in visually sensitive areas is that harvested areas must have trees that are at least seven metres tall before adjacent areas can be harvested. Also, forest cover requirements will vary according to the degree of visual sensitivity and will permit a maximum of between five and 25 per cent of a visual landscape area to have forests less than seven metres tall at any time.
- **Community and domestic watersheds** - in the timber supply analysis, the forest management guidelines for domestic watersheds in the Arrow timber supply area will be accounted for by limiting the rate of harvest in these areas to allow a maximum of between 20 and 25 per cent of the forested area within a watershed to be less than nine metres tall at any time.
- **Riparian habitat*** - to meet the requirements of the Forest Practices Code, a portion of the timber harvesting land base will be considered unavailable for timber harvesting to account for riparian habitat areas along streams and lakes.
- **Wildlife habitat** - a number of areas have been identified as important for wildlife habitat in the area. Caribou habitat and ungulate winter range will be accounted for in the timber supply analysis by forest cover requirements which specify that a minimum of 25 per cent of the operable area must be covered by forests at least two metres

tall at any time. In addition, for caribou habitat, at least 37 per cent of the operable area must be covered by forests that are older than 140 years and for ungulate winter range at least 40 per cent of the operable area must be covered by forests that are older than 100 years.

- **Biological diversity** - or biodiversity, is the full range of living organisms, in all their forms and levels of organization, and includes the diversity of genes, species, and ecosystems, and the evolutionary and functional processes that link them. The Forest Practices Code requires that biodiversity be managed at both the stand and landscape level.

Leaving wildlife tree* patches for stand-level biodiversity is current practice in the Arrow timber supply area. This practice will be accounted for in the timber supply analysis by reducing the timber harvesting land base. Current practice requires that at least seven per cent of an area must be retained as wildlife tree patches. It is assumed that 50 per cent of this requirement will be met by areas outside of the timber harvesting land base. As a result, approximately 3.5 per cent of the timber harvesting land base will be considered unavailable for harvesting in the timber supply analysis.

Considerations for landscape-level biodiversity will be accounted for in the timber supply analysis by applying objectives for biodiversity to each landscape unit* as established by the district manager for the Arrow timber supply area. These biodiversity considerations will account for the requirement to retain certain portions of all landscape units as old-growth forests.

More specific information regarding mature plus old seral stage* requirements can be found in *Appendix A: Data Package*.

Implications of alternative rates of harvesting

- **Alternative rates of harvesting** - there are many alternative harvest forecasts that can be produced for a given set of forest conditions and management assumptions. Each alternative usually represents a trade-off between the harvest level in the short term and the subsequent rate of decline to the long-term harvest level. For the projected base case forecast*, the initial harvest forecast will be based on trying to achieve the current rate of harvest in the short term without compromising the long-term harvest level. The implications of alternative short-term rates of harvest will be tested in sensitivity analyses*.
- **Implications related to community dependence** - the impact of timber supply adjustments on local communities and the provincial economy is an important consideration in the timber supply review. The September 1994 *Arrow Timber Supply Area Socio-Economic Analysis* reported that, provincially, harvesting, silviculture and processing activities associated with the harvesting of the Arrow timber supply supported 634 direct person-years* and 951 indirect and induced person-years of employment. About 65 per cent of these jobs are located in the Arrow timber supply area.

The socio-economic section of the upcoming timber supply analysis report will review the role of the forest sector in the Arrow timber supply area. To provide this update, current information on employment and fibre flows will be gathered from licensees, processing facilities, the B.C. Forest Service and other stakeholders. Indirect and other related employment at both local and provincial levels will also be estimated using employment multipliers provided by the Ministry of Finance and Corporate Relations.

To examine the implications of alternative rates of harvest, employment co-efficients, reported in person-years per 1,000 cubic metres, will be developed and used to estimate changes to employment levels now and in the future from any potential harvest level changes.

Timber processing facilities

The socio-economic analysis will examine the implications of potential changes of timber supply for the area's major timber processing facilities: the pulp mill operated by Celgar Pulp Limited and the sawmills operated by Atco Lumber Limited, Kalesnikoff Lumber Company Limited, Pope and Talbot Limited, and Slocan Forest Products Limited. During 1996, these mills processed approximately 1.6 million cubic metres of timber and approximately 2.2 million cubic metres of wood chips.

Economic and social objectives of the Crown

In a letter and a memo to the chief forester, the minister of forests has expressed the Crown's economic and social objectives for the province. The harvest flow objectives to be used in the timber supply analysis (see above, "Alternative rates of harvesting") are consistent with the minister's stated objectives.

In addition, economic and social objectives for the area and the general region will be derived from public input.

Your input is needed

Establishing the allowable annual cut is an important decision that requires well-informed and thoughtful public input. Feedback is welcomed on any aspect of this *Information Report*, the *Data Package Appendix* and other topics related to the timber supply in the Arrow timber supply area. The response form at the end of this

Sensitivity analysis

Examines how uncertainty in data and management assumptions affect timber supply.

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.

document will assist you in preparing your comments. As well, Forest Service staff would be pleased to discuss questions or concerns that may help you prepare your response.

Please mail the completed response form and your comments to the Forest Service district manager located at the address below. Your comments will be accepted until February 22, 1999.

After receiving public input, the B.C. Forest Service will finalize the data and management assumptions that will be applied in this timber supply analysis. The timber supply analysis will be completed and available for review by Fall of 1999. You may also wish to participate in the second public review period, which will follow the release of the *Arrow Timber Supply Area Analysis Report*.

Following the second public review period, the chief forester will examine all the information available in order to review the timber supply for the Arrow timber supply area. The chief forester will then establish the allowable annual cut based on his consideration of the factors as required under Section 8 of the *Forest Act*.

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 copies of the responses are requested, personal identifiers will be removed before the responses are released.

**For more information contact and/or
mail your comments to:**

District Manager
Arrow Forest District
B.C. Forest Service
845 Columbia Avenue
Castlegar, B.C.
V1N 1H3

Phone: (250) 365-8600
Fax: (250) 365-8568

or electronically mail to:

Peter.Lewis@gems9.gov.bc.ca

APPENDIX A

Data Package Description of Data Inputs and Management Assumptions

This appendix is available upon request from the
Ministry of Forests.

Offices are located at:

Arrow Forest District
845 Columbia Avenue
Castlegar, B.C.
V1N 1H3
Phone: (250)365-8600

Nelson Forest Region
518 Lake Street
Nelson, B.C.
V1L 4C6
Phone: (250) 354-6200

Timber Supply Branch
3rd Floor - 595 Pandora Avenue
P.O. Box 9512,
Stn Provincial Government
Victoria, B.C.
V8W 9C3
Phone: (250) 356-5947