

**BRITISH COLUMBIA
MINISTRY OF FORESTS**

Fraser Timber Supply Area

**Rationale
for
AAC determination**

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Chief Forester**

**effective April 1, 1995
until next determination within five years**

Introduction

Description of the timber supply area

The Fraser Timber Supply Area (TSA) is situated in the southwest mainland portion of the Vancouver Forest Region and is administered from the Chilliwack Forest District Office in Rosedale. The TSA covers 1.17 million hectares (ha) and runs along the U.S. border, taking in the Greater Vancouver Regional District. To the northwest the TSA is bounded by the Soo TSA, and to the north and east it borders the Lillooet and Merritt TSAs, respectively.

The terrain of the Fraser TSA is rugged, with substantial areas of non-forest land. In consequence, only 570 266 ha are considered productive forest land. For a number of reasons—including operability, environmental sensitivity and low productivity sites—this total is further reduced to leave a long-term timber harvesting land base of 275 083 ha, just over 23 percent of the total land base. This figure is almost 90 000 ha smaller than the comparable figure used for the 1984 analysis, due primarily to improved mapping of inoperable areas.

The major biogeoclimatic zones in the TSA are the Coastal Western Hemlock, Mountain Hemlock, and Alpine Tundra. In the eastern portion are also found small areas of the Interior Douglas-fir and Engelmann Spruce-Subalpine Fir zones. Approximately 48 percent of the timber harvesting land base contains hemlock/balsam stands, with Douglas-fir on 39 percent. Elsewhere there are smaller areas of cedar, spruce, pine, larch and deciduous. Due to the long history of harvesting in the TSA, the forested areas hold a large proportion of younger, regenerated stands—predominantly under 70 years—that are almost old enough to be harvested. The majority of mature stands for all species are on poorer growing sites, typically at higher elevations.

About 70 percent of the wood harvested in the Fraser TSA is processed within the TSA. There are 110 major timber processing facilities in the TSA, distributed among numerous large and small communities. About 90 percent of the timber processed by these facilities originates outside the area, but harvesting is still an important component of local economies, particularly in the smaller towns in the Fraser Canyon. The proximity of the forested areas to the large and growing population centres in the Lower Mainland has meant that the tourism industry and outdoor recreation sector are also important to the TSA. Several major highways transect the TSA, and these have drawn attention to the importance of visual quality management.

History of present AAC

The present allowable annual cut (AAC) for the TSA came into effect in 1987 and is 1.765 million m³. It was apportioned by the Minister of Forests in 1993 as follows:

	Cubic Metres	% of AAC
Forest Licences (9)	1 300 206	73.67%
Small Business Forest Enterprise Program	353 835	20.05%
Major Timber Sale Licensees >10 000 m ³ (1)	18 562	1.05%
Woodlot Licences	10 000	0.57%
Temporary Licences (incl. deciduous)	75 000	4.25%
Subtotal (allocated)	1 757 603	99.58%
Unallocated	7,397	0.42%
Total = current AAC	1 765 000	100.00%

New AAC determination

Effective April 1, 1995, the new AAC for the Fraser TSA will be 1 550 000 m³. This is a reduction of approximately 12 per cent from the previous level. This includes a component of deciduous-leading forest types currently specified in an 8 811 m³ existing licence (about to be increased to 11 000 m³) plus additional available volume up to a combined maximum annual deciduous harvest of 57 000 m³. This AAC will remain in effect until a new AAC is determined, which must take place within five years of this present determination.

In reaching this determination, two issues were of particular concern to me. The first is my jurisdiction to address informal log-around strategies, which I have addressed in detail in my consideration of 7(3)(a)(vi), "Planning delays". The second issue is the accuracy of the inventory information with respect to mature volumes in existing stands, which I have addressed in detail in my consideration of section 7(3)(a)(i), "Growth and yield predictions" - *mature volumes in existing stands*. Both issues are also dealt with at length under the heading "Reasons for decision".

Information sources used in the AAC determination

Information considered in determining the AAC for the Fraser TSA includes the following:

- 1993 Forest inventory planning file with manual updates to 1991, including spatial information for environmentally sensitive areas (ESAs); British Columbia Forest Service (BCFS);
- Spatial information for the following:
 - recreation inventory, including visually sensitive areas
 - deer winter range
- Five-year timber harvesting development plans and 20-year plans;
- Silviculture history records, BCFS;

- Forest Information Reporting System, ad hoc reports; BCFS;
- *Fraser TSA Timber Supply Analysis*, BCFS, October 1993;
- *Fraser TSA Socio-Economic Analysis*, Crane Management Consultants Ltd., June 1994;
- *Fraser TSA Timber Supply Review Discussion Paper*, BCFS, June 1994;
- *Fraser TSA Summary of Public Input, draft*, BCFS, October 31, 1994;
- Letter from Minister of Forests, dated July 28, 1994, to Chief Forester stating the Crown's economic and social objectives;
- *Fraser TSA Timber Supply Review Audit*, Fraser Technical Working Group, September 16, 1994 (referred to in this document as the FTWG analysis);
- Technical review and evaluation of current operating conditions through comprehensive discussions with Forest Service staff, including a meeting in the Chilliwack Forest District on November 17 and 18, 1994, with a helicopter tour of parts of the TSA.

Technical limitations of the information used

The *Forest Act* requires me to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis and the inventory and growth and yield data used as inputs to the analysis formed the major body of technical information used in my AAC determination for the Fraser TSA. The timber supply analysis is concerned primarily with biophysical factors—such as rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices. They also indirectly incorporate some economic information such as an operability classification that defines the types of terrain and timber that can be physically and economically accessed given current technology and markets.

However, the analytical techniques used to assess timber supply are simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due to both random variation and ongoing, science-based improvements in the understanding of ecological dynamics.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural, and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide the correct answer or solution to forest management problems such as AAC determination. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information I must consider in AAC determinations.

In making the AAC determination for the Fraser TSA, I have considered the limitations of the technical information provided. In particular, attention has been drawn to a potential inaccuracy in the inventory information with respect to mature volumes in existing stands, as discussed below under my consideration of section 7(3)(a)(i) - *mature volumes in existing stands*. It could be argued that it would be desirable to wait for clarification from an inventory audit which is in progress, in order to assess any implications for timber supply. However, I am mindful both of the urgency to redetermine outdated AACs, and of the fact that each determination will involve

some degree of uncertainty with respect to some part of the data, as noted in "Guiding principles" below. Moreover, one of the main benefits of the Timber Supply Review, in addition to reassessing the supply provincially, is the identification of areas of concern regarding timber supply—particularly with respect to potential inaccuracies in information—with the objective of achieving timely resolution. Thus I have decided to rely at this time on the inventory assumptions incorporated in the BCFS timber supply analysis for the Fraser TSA as the best information available on which to base my determination. The outcome of further work to clarify the existing mature volumes cannot be predicted at present, but with the need for this clarification now clearly identified, the matter will be resolved in as timely a manner as possible for consideration in any future redetermination of the AAC for this TSA.

Statutory framework

Section 7 of the *Forest Act* (revised 1992) requires the Chief Forester to consider various factors in determining AACs for TSAs. Section 7 is appended as Appendix 1.

Guiding principles for AAC determinations

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. One important way to deal with uncertainty is to redetermine AACs frequently, to ensure they incorporate up-to-date information and knowledge. This principle has been recognized in the legislated requirement to redetermine AACs every five years.

In considering the various factors that Section 7 of the *Forest Act* requires me to take into account in determining AACs, I attempt to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the AAC—such as optimistic assumptions about harvesting in unconventional areas or using unconventional technology that are not substantiated by demonstrated performance—or to factors that could work to reduce the AAC—such as integrated resource management (IRM) objectives beyond those articulated in current planning guidelines.

The impact of the Forest Practices Code on timber supply is a matter of considerable public concern. Even without the Code, I consider it reasonable to expect that, based upon recent trends, the constraints upon timber supply from the application of current guidelines would become increasingly significant over the next five years. In determinations made prior to implementation of the Code I have not had the benefit of formally established regulations or standards which might assist me in assessing the impact of new constraints on timber production which might be imposed under the Code; these will be included in the next timber supply analysis. However, while I have not considered any more stringent restrictions or additional impacts upon timber supply beyond those anticipated to occur due to the application of current guidelines, I have assumed that the Code will at the very least entrench the standards exemplified by current guidelines as statutory requirements.

The impact on the timber supply of land-use decisions resulting from regional planning processes such as the Commission on Resources and Environment (C.O.R.E.) process or from sub-regional processes such as the Land and Resource Management Planning (LRMP) process is a matter often raised in discussions of AAC determinations. In this respect, in determining AACs it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from land-use decisions which have not yet been taken by government. Thus I do not consider the possible impacts of existing or anticipated recommendations made by such planning processes, nor do I attempt to anticipate any action the government could take in response to such recommendations.

Moreover, due to the complexity and time requirements of the timber supply analysis process, it may not always be possible in the current round of analysis to address some land use decisions which have already been made. The ongoing five-year AAC review will ensure such decisions will be addressed in the near future. While this was not an issue in the Fraser TSA, a related issue—informal log-around strategies implemented because of uncertainties surrounding future land-use decisions—was of particular concern. I have addressed this issue in detail in my consideration of section 7(3)(a)(vi) "Planning delays" and under the heading "Reasons for decision".

The Forest Renewal Plan will fund a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. In general it is too early for me to assess the consequences of these activities, but wherever appropriate I will take their effects into account. The next timber supply review will be better positioned to determine how the Plan may affect the short- and long-term timber supply.

Some have suggested that, given the large uncertainties present in some cases with respect to some of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving, and management issues changing. Moreover, in the past, waiting for improved data has created the extensive delays that have resulted in the current urgency to redetermine many outdated AACs. In any case, the data and models available today are far superior to those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that in view of data uncertainties I should immediately reduce some AACs in the interests of caution. However, any AAC determination I may make must be the result of applying my judgement to the best available information, taking any uncertainties into account. No responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia and of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act*.

Consideration of factors as required by Section 7 of the *Forest Act*

The role of the "base case":

In considering the factors required under Section 7 to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the timber supply review project. For each determination a timber supply analysis is carried out, using a data package comprising three categories: land base inventory, timber growth and yield, and management practices. Using this set of data, a computer simulation model produces a series of timber supply forecasts. Each forecast is based on the same set of data, and reflects different decline rates, starting harvest levels, and potential trade-offs between short- and long-term harvest levels. From this range of forecasts, one is chosen which avoids excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the "base case" forecast, which forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, **the base case is not an AAC prediction.** Rather, it is one possible forecast, whose validity—as with all the other forecasts provided—depends on the validity of the assumptions incorporated into the computer simulation which generated it.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions about the timber supply must be adjusted, if necessary, to more properly reflect the true, current situation.

These adjustments are made on the basis of informed judgement in accordance with the best currently available information about forest management which—particularly in this period leading up to the implementation of the Forest Practices Code—may well have changed since the original data package was produced.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, **the AAC determination itself is not a calculation but a synthesis of judgement and analysis. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with base case forecast.** Once an AAC has been determined that reflects appropriate assessment of all factors required to be considered, the component of judgement in the determination means there is no additional precision to be gained by carrying out a specific computer model run at the exact AAC determined.

The *Forest Act*, Section 7 (3)

In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area

Inventory information

-general comments

The TSA was inventoried in 1974, and this information, partially updated to 1991 with age, height class etc. projected to June 1992, was included in the data package for the BCFS Fraser Timber Supply Analysis. I am satisfied that this information is the best available, but it does contain some uncertainties and I have been mindful of these in determining this AAC, as discussed in various sections below, particularly with respect to mature volumes in existing stands.

- age class structure

The age distribution of forest stands on the TSA's timber harvesting land base shows a preponderance of 20-to-40-year-old timber. This immature timber, which has resulted mostly from past harvesting, will not be ready for harvest for another 40 to 50 years. Most of the mature timber upon which timber harvesting will depend in the short term is located on poor growing sites. This means a relatively greater area will need to be harvested in the short term than if the harvest were coming from sites of average quality. The implications of this with respect to meeting forest cover requirements have been taken into account in the BCFS timber supply analysis.

(The concentration of these poor growing sites in one age-class group will continue to exacerbate the effect of forest cover requirements on timber supply at 120- to 130-year intervals in the future whenever the harvest becomes dependent upon these poor growing sites.)

- aggregation procedures

The possibility for the introduction of error through the aggregation of inventory data was raised as an issue for discussion in the Fraser Technical Working Group (FTWG) analysis. However, the FTWG analysis showed that aggregation was not an issue affecting the timber supply forecast in the Fraser TSA.

Growth and yield predictions

- mature volumes in existing stands

The accuracy of the existing mature wood volumes was not raised as a critical factor in the Public Discussion Paper (PDP) for this TSA, but District staff have since indicated a concern that these volumes may be overestimated in the inventory. This concern was based on operational cruise data as well as an analysis done as a precursor to an inventory audit which will compare actual volumes with projected inventory volumes. Preliminary findings from this audit now indicate a likelihood that these volumes are indeed overestimated. However, the findings are not conclusive at this point, and further sampling work is needed to clarify the results. Any potential inaccuracy in the data cannot be systematically assessed until completion of this work later this year.

The BCFS timber supply analysis shows that the harvest forecast in the Fraser TSA is highly sensitive to overestimation in the existing mature volumes. If the volumes were overestimated by just 10 percent, the initial harvest rate would have to be reduced by 450 000 m³/year from that shown in the base case, to a level below the long-term harvest level.

Because the evidence for overestimation is not conclusive at this time, I have considered this factor only as a *potential* risk to timber supply, and have made no reduction to reflect this risk in this determination. However, the *potential* risk is considerable and could have serious consequences for timber harvesting in the Fraser TSA. If analysis of the additional sampling results indicates that the existing volumes are significantly overestimated, the high sensitivity of the timber supply to this factor may require an early re-determination of the AAC.

- regenerated stand volumes

Concern was raised in the FTWG analysis that natural stand yield estimates were used to model all regenerated stands except for Douglas-fir on good and medium growing sites. The FTWG analysis showed a long-term harvest level that was slightly higher than in the BCFS analysis. This concern was addressed in a sensitivity test in the BCFS analysis, which examined the effect of varying regenerated stand yield estimates by 20 percent. This sensitivity analysis showed that the estimated yield of regenerated stands is not a factor affecting the short-term timber supply; potential inaccuracies in regenerated stand yield estimates are therefore not a significant factor in this AAC determination. If the volumes are underestimated it may become possible in the future to increase the long-term harvest level to some extent, but this remains speculative at present.

Minimum harvest ages

The BCFS timber supply analysis assumed the minimum harvest age to be the culmination age for each stand (i.e. the age at which the average annual growth rate of the stand is at a maximum). Sensitivity analysis indicated that varying the minimum harvest age by 20 years could have a significant impact on timber supply. However, the currently assumed minimum age is the best estimate of resource managers in the area, and it would be inappropriate for me to assume an arbitrary variation. The feasibility of changes in the

minimum harvest ages, together with associated short-and long-term timber supply impacts, should be given careful review for the next analysis. For the purposes of this determination I have assumed that the harvest ages used in the BCFS analysis are appropriate.

Land base contributing to timber harvest.

The criteria for determining areas to be included in the timber harvesting land base for the Fraser TSA have changed since the last analysis in 1985, particularly with regard to operability mapping. The result of these changes is that the timber harvesting land base is 25 percent smaller than was estimated in the 1985 analysis. However, because most of the areas removed from the land base by the new mapping are areas which are mostly poor growing sites, this has not affected the allowable harvest level proportionally.

The operability information in the current inventory used in the BCFS timber supply analysis was produced in consultation with licensees. There is general agreement among licensees that the operability information reflects *current* operational reality. However, licensees consider that, with rising timber prices, areas that are not currently operable may become operable in the future, and that this would increase the size of the operable land base.

While this is a valid possibility, there are also other factors, such as the Protected Areas Strategy (PAS) and the management of spotted owl habitat, which may result in a reduction to the harvestable land base. Until performance has been demonstrated with respect to increased operability, or until land-use decisions have been made with respect to owls or PAS, it would be premature and speculative to consider either an increase or a decrease in the size of the timber harvesting land base to be used for the purposes of this AAC determination under Section 7.

As discussed below (under 7 (3) (a) (vi) "Planning delays") I am concerned that the log-around strategy currently in place in this TSA, which is being used to avoid harvesting in areas affected by PAS, spotted owl, and other sensitive issues (e.g. the urban/forest interface on Bowen Island), is resulting in undue harvesting pressure on the remaining land base. As I have indicated below under the heading "Reasons for decision", I believe there are statutory reasons why this issue may not be addressed satisfactorily in an AAC determination under Section 7 of the *Forest Act*. I am therefore recommending that in this case advantage be taken of the provisions under Part 15 of the *Forest Act* to avoid the conflict which might otherwise arise on the remaining land base between integrated resource management objectives and the licensees' legal right to harvest. As discussed below, the only other alternative would be to permit harvesting in the areas which the log around strategy is attempting to protect.

Timber Licence reversion

Harvested volumes from Timber Licences, which are old tenure arrangements, do not contribute to the AAC for a TSA. However, once they are harvested, these areas revert to the Crown and future harvests from them will then contribute to the AAC for the TSA. In this TSA, Timber licences amounting to less than 10 000 ha are scheduled to revert within the next 10 years to Crown land, after being harvested and restocked. The analysis shows that this addition increases the long-term timber supply for the TSA, but will have no effect in the short-term.

Timber supply profile

- deciduous forest types

Deciduous forest types that are estimated to be harvestable cover an area of about 14 000 hectares in this TSA. Most of this originates from conifer harvesting between 1900 to the 1960s without managed reforestation, which resulted in deciduous forest types regenerating in the area. The BCFS timber supply analysis assumes that over the long term, deciduous forest types will be converted to good-site Douglas-fir stands after harvesting. In practice, deciduous forests are being converted to conifer forests both through harvesting and through a rehabilitation program. Due to the low wood volumes present in deciduous stands, this conversion will have very little impact on the short-term timber supply. However, if the conversion is not carried out, some of the best sites in the District will continue to support low (deciduous) volumes, and the long-term timber supply could potentially be reduced by up to 100 000 m³ per year.

At present, 65 000 m³ of the AAC are apportioned to a temporary deciduous licence which is due to expire in 2008 AD. However, to date this volume has never been fully utilized and the deciduous licence has been reduced to a current volume of 8 811 m³/year, which I understand is about to be increased to 11 000 m³. A licensee raised the concern that if the AAC must be reduced, the deciduous component should first be removed so that any reduction in the apportioned deciduous harvest of 65 000 m³/year would not affect the overall harvest reduction. However, deciduous stands form an integral part of the overall land base of the TSA, and the harvest forecast shown in the BCFS timber supply analysis report included a contribution from deciduous stands in both the short and long term. Since the deciduous component was not removed during the analysis—which included complex assessments of the impacts of forest cover requirements relative to the overall land base—it would therefore be inappropriate to remove the deciduous component for the AAC determination, especially at a time when there is increasing demand to develop deciduous forest types.

Therefore the AAC that I determine will include a deciduous component. This will provide for the economic use of deciduous stands, facilitate their ongoing conversion to good-site Douglas-fir stands, and account for the obligation to the Crown in the existing deciduous licence.

(ii) the expected time that it will take the forest to become re-established on the area following denudation;

Regeneration delay

The BCFS timber supply analysis assumed regeneration delays of three to six years, depending on site quality and tree species. District staff verified that this is consistent with current practice. If the use of herbicides becomes limited by public pressure, there is a risk that the regeneration delay may be extended, which could impact timber supply by increasing the difficulty of achieving "green-up" to meet forest cover requirements. However, I cannot speculate on the likelihood of an increased regeneration delay from this cause, and I am therefore satisfied that the regeneration delay assumed in the BCFS timber supply analysis is appropriate for this determination.

Not-satisfactorily-restocked areas

The current backlog of NSR is 13 989 hectares and is scheduled to be restocked within the next five years. On the basis of current management practice, and the District's performance with reforestation, I am confident that this objective will be met.

(iii) silvicultural treatments to be applied to the area;

Incremental silviculture

Fertilization: The BCFS timber supply analysis assumed that all poor- and half the medium-site Douglas-fir stands are fertilized. I am satisfied that this adequately represents current practice, and I understand that a four-percent increase in timber supply at harvest age has been incorporated in to the BCFS analysis.

Juvenile spacing: Although no special consideration was made in the BCFS timber supply analysis for spacing, the yield estimates used in the analysis assume basic silviculture is carried out. Juvenile spacing is done in the District to meet these basic silviculture requirements, and also to improve value.

Other silviculture practices, e.g. pruning, are also recognized to produce value increases, not volume increases, and will therefore not affect this determination.

Non-clearcut harvesting practices

The FTWG analysis indicated a potential for commercial thinning to influence both the short- and long-term timber supply. While there may be opportunities for commercial thinning in this TSA, there has been little performance to date, and it would be speculative for me to consider any impacts on short-term timber supply from commercial thinning in this determination.

There may be some opportunities to practice selection harvesting in visually sensitive areas, which I have considered below under 7 (3) (a) (v) "Constraints...". Also the District is proposing to introduce a mandatory compliance procedure on all new cutblocks planned by licensees on their next five-year development plans, to ensure the District meets or exceeds the Vancouver regional requirement for harvesting 10 percent of the overall volume by alternate silviculture systems. The results of these measures will be incorporated into the next timber supply analysis.

Rehabilitation programs

Some deciduous stands are being rehabilitated (see 7 (3) (a) (i) above, "Timber supply profile"). An allowance for this is included in my determination.

Early harvesting is planned for some stands which are severely under stocked as a result of brush competition during establishment. The BCFS timber supply analysis, which assumes that these stands are well stocked, may therefore be overestimating the yield from these stands. However, the area involved is less than 5 000 ha, and I am satisfied that a reduced yield from this small area will not significantly affect timber supply in the short term.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area;

The BCFS timber supply analysis assumed utilization standards of 17.5 cm diameter at breast height (dbh) a 30 cm stump height, and a 10 cm top diameter. Although one licensee has been exceeding these standards, this is not typical of all licensee performance, and I am satisfied that the assumption used in the analysis adequately represents the minimum utilization standards predominantly practiced in the area. The standard Ministry assumptions for decay, waste and breakage were applied in the analysis, and I am satisfied these are appropriate.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production;

The Ministry of Forests is required by the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown, having regard to the immediate and long-term economic and social benefits, and, in consultation and co-operation with other agencies, to plan, coordinate and integrate the use of a variety of forest-related resources. The extent to which integrated management objectives for various forest resources and values constrain the timber supply must be considered in AAC determinations.

Integrated Resource Management (IRM) objectives

- *cutblock adjacency*

In order to protect non-timber resources such as wildlife, water quality and aesthetics, current harvesting practices limit the size and shape of cutblocks, and prescribe minimum green-up times for adjacent cutblocks. This provides for a distribution of harvested areas and retained forest cover across the landscape.

The BCFS timber supply analysis assumed for this TSA the use of at least a "four-pass" harvesting system, in which a maximum of 25 percent of the timber harvesting land base is permitted to be less than three meters tall. Sensitivity analyses indicated that the harvest forecast is not sensitive to a five-percent change in the amount of area permitted to be less than three meters tall. I am satisfied that the assumption in the analysis adequately represents current management practices in areas without more restrictive cover constraints, such as visually sensitive areas or recreation areas, which are dealt with elsewhere in this rationale.

- *visually sensitive areas*

One of the resources required by the *Ministry of Forests Act* to be managed by the Ministry of Forests is outdoor recreation, which is defined under the *Forest Act* to include scenic features. Visual landscape foresters in B.C., in collaboration with specialists in other parts of the world, have developed procedures for identifying and managing visually sensitive areas. These procedures incorporate both biophysical and social factors—including visual sensitivity ratings, numbers of viewers and their perceptions, and others—and provide recommended visual quality objectives (VQOs) for visually sensitive areas.

To meet these objectives, constraints must be placed on timber harvesting, road building and other forest practices in the sensitive areas. These constraints are based on research and experience, and on public preferences and acceptance of degrees of alteration of visual landscapes. The constraints are expressed in terms of "forest cover" requirements which relate to the maximum allowable percentage of a landscape unit that can be harvested at any one time, and to "visually effective green-up", i.e. the stage at which regeneration is perceived by the public as newly established forest.

In the Fraser TSA, 28 percent of the timber harvesting land base is presently subject to forest cover requirements for visual sensitivity. In the BCFS timber supply analysis, visually effective green-up was assumed to be achieved when the average tree height reaches five meters. The proportion of each visually sensitive area that was allowed to be less than five metres in height at any time depended upon the visual sensitivity of the area, and varied from 8 to 31 percent. Both the BCFS analysis and the FTWG analysis indicated that the short-term timber supply was highly sensitive to variations in the percentage of area permitted to be "below green up".

Licensees have suggested that forest cover requirements for visual quality be relaxed, which would result in a significant increase in the timber supply in both the short and long terms. Others submit that tourism is very important to the Fraser TSA and that

clear-cuts are simply not acceptable within viewscales. I realize that the timber supply forecast is very sensitive to changes in forest cover requirements, but since the present requirements have been developed by professional landscape foresters in consistency with international procedures, it would not be reasonable for me to arbitrarily assume or impose a change in these already established forest management practices.

I have therefore assumed that the way in which visually sensitive areas have been modelled in the analysis is appropriate for use in this determination.

It must be noted, however, that current harvesting performance in visually sensitive areas is less than that modelled in the BCFS timber supply analysis. If this trend were to continue, the long-term timber supply would be adversely affected. Every effort should therefore be made to encourage licensees to harvest the permissible volumes within visually sensitive areas.

- deer winter range

In the BCFS timber supply analysis, deer winter range was modelled by assuming that the amount of deer winter range currently identified by the Ministry of Environment, Lands and Parks (MELP) will be maintained indefinitely. The deer winter range identified by MELP is predominantly poor- and medium-site Douglas-fir, with lesser amounts of other forest types.

The analysis assumed that current areas of deer winter range may be harvested as other areas become old enough to provide replacement winter range, generally at ages greater than 100 years. Licensees raised the concern that the deer winter range was identified using forest cover criteria, rather than the presence of animals. In response, MELP has advised that although the provision of deer winter range on a block-by-block basis is flexible, overall 18 000 hectares of mature timber must be maintained at 100 years or older in the operable land base of the TSA to sustain regional and district populations. This requirement corresponds to the assumptions in the BCFS timber supply analysis, which I therefore consider to be suitable for use in determining this AAC.

- recreation zones

The Fraser TSA contains 42 326 hectares, 15 percent of the timber harvesting land base, in various areas classified as Recreation Management Class 1. The BCFS timber supply analysis assumed an average forest cover requirement for all of these areas that allowed a maximum of 20 percent of the area to be less than five metres tall, i.e. a "five-pass" harvesting system. The timber supply forecast did not show significant sensitivity to this requirement, and it was not raised as a concern in the public input received (although it was suggested that insufficient recognition was made of the economic benefits of recreation and tourism). I am therefore satisfied that the forest cover assumptions used in the analysis with respect to recreation zones are suitable for use in this determination.

- botanical forest products

Public input suggested that in the socio-economic analysis insufficient recognition was made of the benefits to be obtained from mushrooms and other botanical forest products. While an increase in harvesting activities related to these resources could present some downward pressure on timber supply, at this time I have no quantifiable evidence to consider; therefore in this determination I have not made any specific allowance in this regard.

- protection of riparian habitats

The BCFS timber supply analysis assumed that 2 percent of the net operable land base would be required for streamside management. The assumption of 2 percent was not raised as an issue in the FTWG analysis, and I am satisfied that this is a reasonable estimate of current practice.

- spotted owl habitat

Spotted owls are nationally designated as an endangered species in Canada. There are currently an estimated 100 pairs in southern British Columbia, and most of the known locations are in the Fraser TSA. Responsibility for determining the land-use aspects of a strategy for managing spotted owl habitat in B.C. lie outside the mandate of the chief forester. These may be addressed by the B.C. Cabinet or by the Minister of Forests.

In my opinion, spotted owl management will undoubtedly have a significant impact on timber supply in this TSA. If all the known potential habitat for spotted owls identified in the recent Spotted Owl Recovery Team Options Report were to be deleted from the TSA, the long-term timber harvesting land base would be reduced substantially. However, until formal land-use decisions are made, I cannot speculate on the likelihood of such impacts. In particular, based on my interpretation of my jurisdiction, under Section 7 of the *Forest Act* I cannot assume or account for the removal of any part of the land base contributing to the AAC for the TSA until a formal land-use decision has been implemented (see "Reasons for decision" below). Thus I have made no adjustment at this time to the AAC in relation to the timber supply impacts caused by spotted owl management.

However, the present log-around strategy, aimed at protecting spotted owl habitat pending a formal land-use decision, has contributed to significant planning delays, as discussed in 7 (3) (a) (vi), "Planning delays" below. An early resolution of this issue will therefore be required to avoid harvesting at excessively high rates on those parts of the TSA not affected by the "log-around" strategy. In recognition of this and other factors

contributing to planning delays, as discussed under "Reasons", I am recommending the specification of certain areas in the TSA as designated areas under Part 15 in order to effect an interim AAC reduction until these land-use questions are resolved.

- *Other factors:*

It should be noted that there are several other factors which do not presently affect timber supply in the TSA but which when implemented may have the potential to reduce supplies to a degree which is not possible to assess at this time, and for which I have therefore made no specific allowance in this determination.

These include: Forest Ecosystem Networks; increased riparian constraints, longer green-up, and restrictions on cutblock size and rate of cut in community watersheds; the development of an integrated resource plan for the Nahatlatch watershed to address aboriginal cultural and heritage values, deer and goat habitat areas, and mushroom picking areas; and a Local Resource Use Plan in the Chilliwack River watershed which will result in changes of practices to address rate of cut, water quality, heritage values, visual impacts, and the "urban /forestry interface".

(vi) any other information that, in his opinion, relates to the capability of the area to produce timber;

Planning delays

The avoidance of harvesting in contentious areas in the Fraser TSA has led to planning delays which now have serious implications for the determination of an appropriate AAC for the TSA.

In recent years it has become increasingly difficult to plan harvestable cutblocks in the TSA due to uncertainties about the future use of certain areas affected by the Protected Areas Strategy (PAS), by spotted owl habitat, and also by public sensitivity with respect to the urban/forest interface (for example on Eagle Ridge). Areas affected by spotted owl habitat and the PAS alone occupy approximately 22% of the long-term timber harvesting land base of the TSA.

To protect the integrity of all these areas until their future use can be specified through a formal land-use decision, an informal interim log-around strategy has been developed, whereby the planning of new harvesting is avoided in contentious areas.

As a result of the PAS alone, during the past four years, the harvesting of approximately 10 percent of the wood volumes in cutblocks scheduled in licensees' 5-year development plans has been deferred. The log-around strategy has been successful up to now in protecting contentious areas from development until land-use decisions can be made. However, the strategy now also presents two serious problems, related (i) to the availability of wood to meet licence requirements, and (ii) to the potential to harvest in

some areas at rates that may compromise integrated management objectives, as outlined below.

(i) The first of these problems is that the log-around strategy has effectively removed significant volumes of timber from consideration for harvest—the Pinecone Lake/Burke Mountain PAS study area alone contains four percent of the long-term timber harvesting land base. The removal of these volumes has not yet affected the licensees' ability to find sufficient wood to meet the existing AAC, but there are indications it will soon do so. The allocated harvest volume of one forest licence may not be met in 1995 and 1996 without abandoning the log-around strategy, since the licensee's areas of interest are considered to be spotted owl habitat. Moreover, due to PAS and spotted owl, in the 1992 to 1996 cut control period, the Ministry's Small Business Forest Enterprise Program (SBFEP) will be able to harvest only 80 percent of its apportioned quota under the current log-around strategy.

Thus, while the log-around strategy has provided effective interim protection to date for affected areas, its continuation could soon constrain the timber supply to an extent that compromises licensees' ability to harvest their quotas.

(ii) The second problem related to the log-around strategy is that, as I understand the current statutory regime, current law requires the AAC for a TSA to be determined from the volume of timber that is suitable and available for harvesting **based on the productivity of the forest land on the entire area of the TSA**, not on a reduced area reflecting expectations about land-used decisions that may be made in the future.

The log-around strategy simply means avoiding harvesting in certain areas in the TSA. Thus for harvesting to continue in the TSA at the level indicated by the AAC, the remaining areas must be harvested at higher rates, to make up for the lack of harvesting in the avoided areas. Continuing this strategy will at some point inevitably compromise integrated management objectives in some areas, which is incompatible with good forest management. This issue has been of particular concern to me in the determination of an appropriate AAC for the Fraser TSA, which I have discussed below, under "Reasons for decision".

Harvest sequencing

- First Nations' concerns

The historic concentration of harvesting in the southern part of the TSA, combined with the present log-around strategy, means that harvesting must soon be concentrated within that part of the traditional territory of the Nlaka'pamux Nation which lies within the Fraser TSA. This includes the Nahatlatch and other drainages. The Nlaka'pamux Nation views this increased development with concern. I met with representatives of the Nlaka'pamux Nation Tribal Council in November 1994 to discuss this issue. Although

the heritage values in many cases coincide with existing recreation areas, I recognize that the issue may have potentially significant social implications for the future.

In addition, I am aware of the Crown's legal obligations resulting from the Delgamuukw decision, whereby resource-use decisions cannot infringe upon constitutionally protected aboriginal rights. However, my determination of an AAC does not prescribe a particular plan of harvesting activity within the TSA and it is independent of any decision by the Minister with respect to subsequent allocation of the wood supply. In my view the AAC I determine for the TSA should not in any way be construed as limiting the Crown's obligation under Delgamuukw.

At this time I do not have sufficient information with respect to potential impacts on timber supply related to uses of the area by First nations to make any specific allowance in this AAC determination.

- industry impacts

Potential impacts of the legacy of harvest sequencing on the timber harvesting industry are discussed under 7 (3) (c) below.

(b) the short and long term implications to the Province of alternative rates of timber harvesting from the area;

The nature of the transition from harvesting in old- to second-growth stands is a major consideration in determining AACs for areas with a significant old-growth component. In the short term, the presence of large volumes of older wood permits harvest levels above long-term levels that can be maintained without impairing the future productivity of the forest land. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined so as to ensure that current and mid-term harvest rates will be compatible with a smooth and orderly transition toward the usually (but not always) lower long-term harvest rates. Thus, timber supplies should remain sufficiently stable that there will be no inordinately adverse impacts on current or future generations. To achieve this, the rate set must not be so high as to cause later disruptive shortfalls in supply, nor so low as to cause undue immediate social and economic impacts.

The BCFS timber supply analysis shows that, due to the availability of older stands, harvest levels in the short and mid terms in the TSA can remain above, but must decline over time toward, a long-term level to be reached thirty years from now. This level will remain relatively steady thereafter. *(N.B., the initially elevated harvest levels indicated in the analysis are dependent upon the presence of sufficient mature wood volumes in existing stands, an issue which is presently under investigation; see 7 (3) (a) (i) above.)*

The BCFS timber supply analysis base case forecast shows an initial harvest rate of 1 550 000 m³/yr, i.e. 12 percent below the current AAC, followed by a decline of 10

percent per decade over the next three decades to a steady long-term harvest level of about 1 180 000 m³/yr.

The BCFS timber supply analysis also examined a number of alternative harvest schedules. In one, the initial rate of harvest was left the same as in the base case, but the rate of decline in subsequent decades was limited to eight percent per decade. This resulted in a projected timber supply shortage 130 years from now (see above, 7 (3) (a) (i), *age class structure*).

Another alternative forecast showed that the current AAC of 1 765 000 m³/yr could be maintained for 10 years, but must be followed by a drop of 21 percent for the next decade to avoid acute timber shortages in decades 6 and 13.

The FTWG analysis confirmed all the major findings of the BCFS analysis, including the sensitivities, with the exception of the long-term harvest level. The base case in the FTWG analysis also used an initial harvest level 12 percent below the current AAC, but this declined to a steady long-term harvest level that was slightly higher than the BCFS analysis (see also *regenerated stand volumes* under 7 (a) (1) above). The FTWG analysis also identified an opportunity for commercial thinning, which I have addressed in 7 (3) (a) (iii) "Non-clearcut harvesting practices".

I have reviewed the socio-economic analysis (SEA) report for the Fraser TSA, which details the community impacts associated with three different timber supply scenarios including the base case described above and two scenarios in which the present AAC is maintained for 10 years, followed by sizeable decreases in subsequent decades. Some public submissions have questioned the validity of estimates used in the SEA, but no documentation was provided. I am aware that although the entire volume harvested in the Fraser TSA provides for only ten percent of total mill requirements, nevertheless some communities are entirely dependent upon the wood supply from the TSA.

In sum, the BCFS timber supply analysis and the socio-economic report indicate to me that an appropriate balance between minimizing both short-term economic disruption and future supply shortfalls would be achieved at this time by some initial reduction in harvest rate followed by a steady rate of decline to a stable level. The BCFS timber supply analysis base case and similar forecasts provide useful information for achieving this purpose, and I have discussed this below, under "Reasons".

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities;

About 70 percent of the wood harvested in the Fraser TSA is processed within the TSA. There are 110 mills in the Fraser TSA, 90 percent of the timber supply for which originates outside the TSA. Public input indicated both a concern for the ability of local mills to obtain adequate wood supplies, and a need for strategies to support local manufacturing.

This may be of particular significance in the case of the Boston Bar mill. This mill is located in the northern part of the TSA, and depends for its timber supply primarily on the Nahatlatch supply block. Due to the historic focus of logging in the southern part of the TSA, and the log-around strategy for spotted owls and protected areas, harvesting operations for several other licensees are also expected to be concentrated in the Nahatlatch in the near future. This intensification of harvesting in the Nahatlatch area may eventually reduce the timber supply to the point where the Boston Bar mill will be obliged to seek wood from the southern parts of the TSA.

However, the allocation and apportionment of wood supplies within or between TSAs are beyond the mandate of AAC determinations, as are the institution of economic or other strategies to support local manufacturing. While I am mindful of the requirements of certain mills, and am aware of the implications that an AAC reduction may have for them, I have no jurisdiction to specify conditions to resolve such issues within an AAC determination.

- (d) **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**

Minister's letter

The Minister has expressed the social and economic objectives of the Crown for the province (letter dated July 28, 1994, attached as appendix) and I understand these to apply the Fraser TSA. They are consistent with the objectives stated in the Forest Renewal Plan and include forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest level changes in a managed transition from old-growth to second-growth forests, so as to provide for continuity of employment. The Minister also stated in his letter that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability". He placed particular emphasis on the importance of long-term community stability and the continued availability of forest jobs. To this end he asked that I consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. The latter would likely require the use of alternative harvesting systems, and to encourage this the Minister suggested I consider the use of AAC partitioned cuts.

The employment and community impact issues in this TSA are discussed in detail in the *Fraser TSA Socio-Economic Analysis*, and I am familiar with the varying impacts described with respect to different harvest levels (see also 7 (3) (b) above). The use of commercial thinning has been discussed in "Non-clear-cut harvesting practices" above, where I concluded that while there may be opportunities for commercial thinning in this TSA, there has been little performance to date, and it would be speculative for me to consider any impacts on short-term timber supply from commercial thinning in this determination.

The operability issue was discussed in "Land base contributing to timber harvest" above. There I concluded that it would be premature to consider either an increase or a decrease in the size of the timber harvesting land base in this determination, and I have therefore decided not to partition any of the harvest to areas outside the currently agreed-upon operable land base.

Local objectives

The Minister's letter suggests that I should consider important local social and economic objectives that may be derived from the public input in the timber supply review. Public input indicated: a concern for the ability of local mills to obtain adequate wood supplies and a need for strategies to support local manufacturing, factors I have addressed under 7 (3) (c) above; a need for greater consideration of botanical forest products, discussed under 7 (3) (a) (v) above; and a need for greater consideration of forest recreation and tourism, also discussed under 7 (3) (a) (v) above.

First Nations

First Nations input indicated a need to address economic benefits and sustainability within their traditional territories. The TSA contains 34 First Nation bands, 9 land claim areas, and extensive cultural and heritage resources. One First Nation—the Nlaka'pamux—participates in a joint venture Forest Licence. 100 Aboriginal people are currently employed in timber harvesting, and there are eight silviculture crews. A change in the AAC would therefore have socio-economic impacts on First Nation communities as it would upon other communities.

- (e) **abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.**

Non-recoverable losses

Both the BCFS and licensees' timber supply analyses assumed annual unsalvaged timber losses to fire and windthrow totalling 17 500 m³/yr. This is consistent with losses experienced in other coastal units, and I am satisfied that this assumption is appropriate for use in determining this AAC.

Reasons for decision

In reaching my determination of an AAC for the Fraser TSA, I have considered all of the factors presented above and have reasoned as follows.

The current AAC for the Fraser TSA is 1 765 000 m³. As outlined in 7 (3) (b) above, the BCFS timber supply analysis indicates that this AAC could be maintained for 10 years only if followed by a drop of 21 percent in the next decade to avoid subsequent acute timber shortages. Such a

drop would be accompanied by proportional reductions in socio-economic activity with increased risk of mill closure and is thus not a desirable option, given that viable alternatives exist.

The base case of the BCFS timber supply analysis provides a projected initial harvest level of 1 550 000 m³/yr, about 12 percent below the current AAC, declining progressively at about 10 percent per decade without disruptions to a steady long-term harvest level of 1 180 000 m³/yr. This forecast conforms with the principles discussed in 7 (3) (b) above, regarding the transition from old- to second-growth harvesting, and may be considered to be within an acceptable range of harvest forecasts for the Fraser TSA at this time, to the extent that my considerations in this determination have verified the current appropriateness of the assumptions used in the BCFS analysis.

In this respect, as discussed in detail in the preceding sections, my examination of all the factors required to be considered under Section 7 of the *Forest Act* has identified no specific issue or factor in this TSA at this time—with one possible exception discussed immediately below—that would require significant adjustment of the assumptions used in the base case analysis.

The one possible exception is the fact that District staff suspect the mature volumes in existing stands to have been overestimated in the inventory data used in the analysis (discussed in 7 (3) (a) (i) above). As noted there, the timber supply forecast is highly sensitive to variation in existing volumes, and if these volumes were indeed overestimated, the initial timber supply forecast indicated in the base case would be too high and the initial harvest level would need to be reduced.

Preliminary results from an ongoing inventory audit indicate that there is a definite risk that the BCFS analysis may have overestimated these volumes. The evidence for overestimation is presently inconclusive, but because of the high sensitivity of the harvest level to variations in existing volumes, and the potentially serious consequences to the timber harvesting industry in the Fraser TSA, more sample plots are being established and studied to confirm or clarify the preliminary results. Reliable results are expected to be obtained later this year.

At this time I cannot predict with any certainty the outcome of this additional work, and it would be inappropriate to impose any harvest reduction based on preliminary results. Nevertheless as stated earlier, there is an urgent need to update our knowledge of timber supply province-wide, and all determinations will involve some degree of uncertainty with respect to some of the data. For this present determination I have therefore decided to rely on the inventory assumptions incorporated in the BCFS timber supply analysis for the Fraser TSA as the best information available at this time with respect to existing volumes, and to accept the initial harvest forecast in the BCFS analysis based on those volumes. However, if reliable results are obtained which indicate that the volumes were in fact overestimated to a degree that jeopardizes the validity of the short-term harvest level indicated in the base case, I will request an immediate review of the timber supply analysis, and if I consider it appropriate at that time, I will redetermine the AAC at a level consistent with the true mature wood volumes.

Aside from the uncertainty with respect to existing mature volumes, which was not suspected as an issue at the time of analysis, the reliability of the base case forecast is validated by the FTWG timber supply analysis. The FTWG analysis confirmed all major findings of the BCFS analysis, including the sensitivities, except for the identification by the FTWG analysis of a slightly higher long-term harvest level and an opportunity in the short term for commercial thinning. I have considered both of these factors above (under 7 (3) (a) (i) *regenerated stand volumes* and 7 (3) (a) (iii) "Non-clear-cut harvesting practices") and I am satisfied that they do not indicate any disagreement between the two analyses with respect to short-term harvest levels.

From my considerations of all of the foregoing, at this time I find no reason to reject the initial timber supply forecast indicated in the BCFS timber supply analysis base case as an acceptable harvest level to be determined under Section 7 for this TSA—with the following significant caution.

As discussed in 7 (3) (a) (vi) above, I am concerned by the difficulty of determining an appropriate AAC for the Fraser TSA while harvesting is being avoided in certain areas in the TSA due to the "informal" log-around strategy which does not have statutory or legal standing but depends solely on co-operation with licensees. As noted, by avoiding new harvesting in areas for which land-use decisions are pending, this strategy reduces the timber supply available to meet licence requirements and forces the concentration of potentially unacceptably high harvesting levels in the remaining areas of the TSA.

Due in large part to the log-around strategy, the SBFEP is already unable to find sufficient wood and one major licensee is projected to have difficulty in this respect in 1995-96. The log-around situation is also compounded by the historical focus of timber harvesting in the southern part of the TSA, such that very high levels of timber harvesting are now about to be concentrated on the Nahatlatch timber supply block area in the north, an area in which concern has been expressed for uses by aboriginal people.

Thus there is an urgent need to address the inconsistency between the land base which contributes to the AAC for the TSA and the land base from which the harvest is expected to be obtained.

Without further consideration it would appear that this inconsistency could be addressed, and the potential overharvesting of particular areas in the TSA avoided, if I as Chief Forester could determine an AAC for the TSA *based on the contribution of the productive forest on only those lands which are unaffected by land-use questions*. Such an AAC would assume the removal of that contribution to the productive forest land which is made by all or a part of the areas for which land-use decisions are pending and which are currently being avoided under the informal log-around strategy.

However, my interpretation of Section 7 of the *Forest Act*, read in conjunction with Section 53 and Part 15 of the *Act*, is that Section 7 does not provide the Chief Forester with the authority to consider any AAC implications of a reduction in the contributing land base for a TSA resulting from harvest deferrals in informal log-around areas. Such consideration would be premised on

an assumed *change in the overall land base* of the TSA, which may only be properly effected under the *Forest Act* by the Minister of Forests under Section 53, or by Cabinet under Part 15.

Thus, the determination of an AAC based on a reduced land base would pre-empt a decision which properly belongs to the Minister or to Cabinet. Moreover, it would not even guarantee the interim protection of the areas in question, since a reduction of the AAC would not of itself define or limit the specific areas within the TSA in which licensees retain legal rights to harvest.

The determination of an AAC based on a reduced land base is thus not an acceptable option; in my opinion, the *Forest Act* requires me as Chief Forester to determine an AAC for the Fraser TSA that is based on consideration of the *entire* productive land base, including the log-around areas. An AAC based on a reduced land base could be determined by the Chief Forester only after the implementation of a formal land-use decision.

Therefore, since I am able to find no statutory support for determining an AAC for this TSA which reflects the limited area on which harvesting is expected to occur if the log-around strategy continues, in the interest of good forest management I have no alternative but to recommend that early consideration be given to the identification of appropriate parts of the Fraser TSA as designated areas under Part 15 of the *Forest Act*, in order that a temporary AAC reduction may be effected.

Such a reduction would be separate from this present AAC determination, and would be followed eventually by a further redetermination under Section 7 to reflect the true overall land base of the TSA, once these have been established. To this end I direct District staff to prepare the detailed information necessary to quantify the impacts on timber supply arising from planning deferrals associated with spotted owl management and PAS study areas.

Action by Cabinet under Part 15 will allow me as Chief Forester to reduce the AAC expediently to a level that is achievable without requiring District staff to approve cutting permits in areas under question or in possible contravention of integrated management objectives. This will also permit the subsequent restoration of the contribution to the AAC made by those lands not protected by the ensuing land-use decision.

To assist in the resolution of the pressing land-use questions in the Fraser TSA, I recommend early commencement of a Land and Resource Management Plan for the area, recognizing that this must be undertaken within the context of the provincial land-use planning priorities and objectives.

In summary, from the foregoing reasoning and with the cautions expressed, it is my determination that the assumptions incorporated in the BCFS timber supply analysis are reliable, that the analysis takes into account forest management practices as currently implemented, and that there are no other factors influencing the validity of the initial harvest level projected in the base case forecast. It is therefore my determination that this initial harvest level represents a suitable harvest level for the Fraser TSA at this time.

Finally, as noted above in 7 (3) (a) (i), the AAC determined for the Fraser TSA at this time must include a deciduous component. This will provide for the economic use of deciduous stands, facilitate their ongoing conversion to good-site Douglas-fir stands, and account for the obligation to the Crown in the existing deciduous licence. The former AAC included an allowance of 65 000 m³/yr of deciduous-leading forest stands. However, the base case forecast did not depend on the harvesting of this full annual amount to achieve the requisite conversion to good-site fir, and harvesting at this level was not achieved on the ground. I have therefore reduced the deciduous-leading component of the AAC by approximately 12 percent to 57 000 m³ in conformity with the reduction in the total AAC.

Determination

Effective April 1, 1995, the new AAC for the Fraser TSA will be 1 550 000 m³. This includes a component of deciduous-leading forest types currently specified in an 8 811 m³ existing licence (about to be increased to 11 000 m³) plus additional available volume up to a combined maximum annual deciduous harvest of 57 000 m³. This AAC will remain in effect until a new AAC is determined, which must take place within five years of this present determination.

Implementation of Determination

This determination will be effective April 1, 1995, and will remain in effect until a new AAC is determined, which must take place within five years of this determination.

District staff should prepare as soon as possible the detailed information necessary to quantify the impacts on timber supply arising from planning deferrals associated with spotted owl management and protected area study areas. From this information, I will recommend the specification of designated areas in the Fraser TSA under Part 15 of the *Forest Act*, in order to prepare for the determination of a temporary AAC reduction with respect to those areas.

District staff should identify areas in which licensees should begin planning to harvest permissible volumes in visually sensitive areas, and should make every effort to encourage licensees to harvest those volumes.

Appropriate steps should be taken for the early commencement of a Land and Resource Management Plan for the Fraser TSA, recognizing that this must be undertaken within the context of the provincial land-use planning priorities and objectives.



Larry Pedersen
Chief Forester

February 28, 1995

Appendix 1

The B.C. *Forest Act* Section 7 (revised 1992) reads as follows:

Allowable annual cut

7. (1) The chief forester must determine an allowable annual cut before December 31, 1995, and after that determination at least once every 5 years after the date of the last determination, for

- (a) the Crown land in each timber supply area, excluding tree farm licence areas and woodlot licence areas, and
- (b) each tree farm licence area.

(1.1) If, after the coming into force of this subsection, the minister

- (a) makes an order under section 6 (b) respecting a timber supply area, or
- (b) amends or enters into a tree farm licence to accomplish the result set out under section 33.1 (1) (a) to (d),

then, with respect to that timber supply area or tree farm licence area, as the case may be, the chief forester is not required to make the determination under subsection (1) of this section before December 31, 1995, or within 5 years after the last determination, but is required to make the determination

- (c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and
- (d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(1.2) When the chief forester determines an allowable annual cut for a tree farm licence area, any management plan that specifies an allowable annual cut for that area is conclusively deemed to be amended so that the allowable annual cut specified in the management plan is the same as the most recent one determined by the chief forester.

(1.3) In determining an allowable annual cut under this section the chief forester may specify portions of the allowable annual cut attributable to

- (a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area,
- (b) different types of timber and terrain in different parts of private land within a tree farm licence area, and
- (c) gains in timber production on Crown land that are attributable to silviculture treatments funded by the Province, the federal government, or both.

(2) The regional manager or district manager shall determine a volume of timber to be harvested under a woodlot licence during each year or other period of its term, according to the licence.

(3) In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall consider

- (a) the rate of timber production that may be sustained on the area, taking into account
 - (i) the composition of the forest and its expected rate of growth on the area;
 - (ii) the expected time that it will take the forest to become re-established on the area following denudation;
 - (iii) silvicultural treatments to be applied to the area;
 - (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area;
 - (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production; and
 - (vi) any other information that, in his opinion, 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 timber processing facilities;
- (d) 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
- (e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

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