BRITISH COLUMBIA
MINISTRY OF FORESTS

Determination of allowable annual cut (AAC) for tree farm licence 44

held by MacMillan Bloedel Limited

Rationale for AAC determination made on December 31, 1993

by

John Cuthbert
Chief Forester

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Introduction

On December 31, 1991, I as Chief Forester determined an allowable annual cut (AAC), for tree farm licence (TFL) 44, held by MacMillan Bloedel Limited (MB), for the period January 1, 1991 to December 31, 1995, of **2.42 million m^3**.

MB appealed this AAC determination to an appeal board which, by majority, varied my determination and set the AAC for the period January 1, 1991 to December 31, 1993, at **2.68 million m^3**. The Ministry of Forests' appeal of this decision to the B.C. Supreme Court was heard in July 1993, and a decision upholding the board's decision was rendered on December 22, 1993.

The expiry on December 31, 1993, of the AAC set by the appeal board requires me to determine an AAC for TFL 44 for a period beginning January 1, 1994. Since AACs are now required to be determined every five years, the period during which this new AAC will remain in effect is not required to coincide with that of MB's Management Plan No. 2. However, although I am not required to do so, for practical purposes I have chosen to determine this AAC for the duration of Management Plan No. 2. I have also extended the period of this plan for one year in order to allow the incorporation of recommendations resulting from the Clayoquot Sound Scientific Panel and interagency planning teams for the special management areas in Clayoquot Sound. The AAC will therefore be in effect from **January 1, 1994** until **December 31, 1996**, unless the licensee submits before that date a new 20-year plan which is satisfactory to the District Manager, in which case the AAC may then be redetermined. Subject to this provision, this document provides the rationale for the determination of the AAC for TFL 44 effective January 1, 1994 to December 31, 1996.

Summary of AAC decision

Information provided to me for purposes of determining an AAC for TFL 44 includes, (amongst other items listed below on page 3) the following:

- **Management Plan No. 2** detailing commitments by the licensee with respect to the management of all forest resources in the licence area;

- **timber supply analyses by MB and the Forest Service (FS)**, which incorporate these commitments to the extent possible and which provide a range timber supply forecasts for a minimum of 200-years that reflect different assumptions based on uncertainties in the technical information used;

- **MB's 20-year plan** which maps how the licensee intends to harvest timber in TFL 44 during the next 20 years, given the commitments made in the Management Plan.

The main purpose of the 20-year plan is to ensure compatibility between the commitments made in the Management Plan, the initial five-year harvest level, and the long-term harvest schedules indicated by the timber supply analysis.

A significant factor in the determination of this AAC was the fact that the 20-year plan submitted by MB did not meet several of the commitments made in Management Plan No. 2, nor did it support the company's proposed initial harvest level of 2.68 million m^3/year. For this reason (and others mentioned below) the AAC determined for the TFL is lower than that proposed by the company.

For other reasons discussed below, the AAC is higher than several of the initial rates of the harvest forecasts produced by the FS.

Areas contributing to AAC

My 1991 AAC determination of 2.42 million m^3 for TFL 44, which was overturned by the Appeal Board, was based on harvest operations being concentrated on the conventionally operable land base. However, the new AAC provides for increased operations on non-conventional and marginal areas in the TFL. The AAC is partitioned to ensure that the harvest volumes attributable respectively to conventional, non-conventional and marginal areas are actually obtained from the appropriate land base component. In this rationale, "current land base" refers to the total of the conventional, non-conventional and marginal areas.

Clayoquot Sound

No reduction has been made to reflect the Clayoquot Sound land-use decision announced by Cabinet on April 13, 1993.

AAC determination

The AAC for TFL 44 was determined in accordance with the requirements of Section 7 of the *Forest Act*. Information available for consideration in addition to Management Plan No. 2, the timber supply analyses and the 20-year plan is listed below on page 3.

The MB and FS timber supply analyses for TFL 44 indicate that, based on the current land base, today's annual harvest rates must decline gradually over about 60 years toward a long-term harvest rate of approximately 1.95 million m^3/year. (FS and MB long-term harvest rates based on the current land base and FS yield figures range from 1.815 million m^3/year to 2.073 million m^3/year depending on the assumptions used.)

In consideration of all available information, and subject to the foregoing observations, the AAC for TFL 44 for the period January 1, 1994 to December 31, 1996 is determined to be **2.45 million m^3**.

Rationale for decision

Factors required to be considered

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

Information sources

The following information was available to me for consideration:

Management Plan No. 2 for TFL 44
5-year development plans
20-year plan
Letter dated November 10, 1993 from the Port Alberni Forest District Manager to MB rejecting the MB 20-year plan
MB timber supply analysis submitted to FS July 30, 1993 and subsequent addenda
FS timber supply analysis prepared by Timber Supply Section
The results of studies required by the Chief Forester in the approval letter of December 31, 1991 for MB's Management Plan No. 2. These included:
- operability studies
- studies of environmentally sensitive areas
- a recreation inventory
- a landscape inventory and analysis.

Consideration of factors as required by Section 7

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

Growth and yield predictions

The FS did not approve all the yield tables proposed by MB for use in the timber supply analysis. However, MB did include an option in its analysis in which the yield tables were adjusted to approximate FS standards. I am satisfied that the expected growth rates used in this MB option, which agreed with the FS analysis based on FS yield tables, are appropriate for use in determining allowable harvest levels for this area.

Inventory information

Current wood volumes for forest stands in the area which were used in both the MB and FS analyses are based on MB inventory estimates. There is no indication that this inventory is not within acceptable limits and I am satisfied that it is suitable for use at this time in determining harvest levels in TFL 44.

Minimum harvest age

Minimum harvest age is the time it takes for stands to grow to a harvestable size. The minimum harvest ages assumed in both the FS and MB analyses range for various timber types from 35 to 85 years. Analyses indicate that at some point in the future, maintaining a reasonable harvest flow will require some stands to be harvested at the minimum age. In the long term the average age of stands harvested will be approximately 85 years.

The FS analysis examined the effect on timber supply of requiring a longer time for trees to grow to a harvestable size (i.e. a higher minimum harvest age). For example it was found that increasing the minimum harvest ages by 5 years would result in a decrease in short-term timber supply, and that the initial harvest rate would need to be reduced from MB's proposed rate of 2.68 million m^3/year to 2.322 million m^3/year.

The significant reduction in short term supply which results from a small increase in minimum harvest age represents an important risk which I considered in determining the AAC. This risk is one of the contributing reasons for the reduction in AAC from the level of 2.68 million m^3 proposed by MB.

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

The regeneration delay of two years proposed by MB was accepted by the FS and used in the FS timber supply analysis. I am satisfied that the use of this assumption is appropriate in determining the AAC on this area.

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

MB's silvicultural treatments on TFL 44 meet basic silvicultural requirements. MB is also carrying out some incremental silviculture work in the form of spacing and genetic improvements to planting stock. While these incremental treatments may have appreciable effects on long-term timber supply, the increased yields will not become available for harvest until the treated stands have reached a mature harvest age. I do not expect incremental treatments to have any significant effect on short-term timber supply. I have therefore made no specific allowance for them in this AAC determination.

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;

Timber utilization on TFL 44 is to FS standards. The decay, waste and breakage factors used in the MB analysis were approved by the FS. I am satisfied that the values assigned to these factors are appropriate for use in determining this AAC.

(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;

Integrated resource management (IRM) constraints

Timber harvesting is just one in a range of uses of forest lands. Integrated resource management (IRM) of forest lands to accommodate all resource values affects the scheduling of the harvest of individual cut blocks. In recent years there have been significant increases in public demand for the use of forest resources other than timber, and in public and professional concern for other forest values. IRM constraints on timber supply in TFL 44 include requirements for landscape management, biological diversity—including protection for threatened species—and protection of riparian zones and other environmentally sensitive areas.

In assessing the constraints on timber production I have considered the commitments to non-timber resources made by MB in Management Plan No. 2 and related documents.

MB states in the summary of Management Plan No. 2 that "the principles of integrated forest management will continue to be the basis for all forest management activities on TFL44".

In Management Plan No.2, MB's "overall goal...is to maintain a continuous supply of forest-based natural resources to meet the demands imposed by society for these resources" (Management Plan No. 2, 1.1). MB goes on to state that its objective is to "practice integrated resource management to meet the overall management goal for TFL 44" (Management Plan No. 2, 1.21). In its *Statement of Management Objectives, Options and Procedures*, MB expands on its overall goal (or objective) as follows:

> "The overall objective for the management of TFL 44 is to provide a continuous supply of forest-based natural resources. Integrated forest management as practiced on TFL 44 will:
>
> Safeguard the soil and water resources, maintain habitat for fish and wildlife and preserve special ecosystems.
>
> Provide continuity of employment and the opportunity for public enjoyment of the forest lands.
>
> Maintain a sustained economic yield of timber from diverse and healthy forests.

> Maintain visual quality in scenic corridors while maintaining a sustainable level of development." (Management Plan No.2, Appendix IV, 1.1)

MB describes its integrated resource management strategies as follows:

> "Management of the resources on TFL 44 will be directed at producing a level of timber harvest which is compatible with the needs of other forest based resources". (Management Plan No. 2, 2.0)

MB's objectives with respect to protection of other resources are stated as follows:

> "To identify and protect significant recreation values, provide opportunity for a broad range of recreation opportunities and to enhance recreational potential for the TFL in keeping with the demands of society" (section 1.23).
>
> "To manage for the maintenance of visual quality of forest landscapes" (section 1.24).
>
> "To maintain the habitat required to sustain fish and wildlife species found on TFL 44" (section 1.25).
>
> "To practice forest management in a manner designed to maintain plant, animal, soil, water, and cultural values at levels commensurate with society's needs" (section 1.28).

Management Plan No. 2 also includes the following statements:

> "Timber harvest plans are finalized only after the needs of other resources have been accounted for" (section 2.0).
>
> "How and where harvest activities are conducted and the level of harvest that can be achieved on the management unit must be decided after allowance is made for all other resources affected" (section 3.0).
>
> "The rate of harvest...must be set at a level which is compatible with the long-term management needs of all other resources" (Appendix IV, section 2.11).

To meet its goals and objectives for TFL 44, MB indicates that it will rely on a number of guidelines prepared by the FS (see, for example, Management Plan No. 2, 2.32). A number of these guidelines have now been incorporated into the "umbrella" *Coast Planning Guidelines*. In my letter of Approval for Management Plan No. 2, December 31, 1991, I also refer to the *Guidelines To Maintain Biological Diversity In TFL #44 And TFL #46*, dated December 1991, which is also referred to in Management Plan No. 2 (Appendix VIII, p. 9). Given MB's commitments with respect to integrated resource management, these various guidelines have assisted me in determining the constraints on

the amount of timber produced from TFL 44 that reasonably can be expected by use of the area for purposes other than timber production.

20-year plan

A significant factor in my considerations under this subsection is the fact that the 20-year plan did not adequately reflect the intent of a number of planning guidelines and strategies committed to by MB, as listed in the District Manager's letter to MB dated November 10, 1993, rejecting the 20-year plan. Despite MB's attempt to explain to me in person how the commitments and requirements would be met in the 20-year plan, in view of my own experience in reviewing the 20-year plan with FS and MB staff, in visiting the area, and in view of the ongoing discussions between MB and FS staff on these matters, I remain convinced that this plan does not show how the company could find sufficient timber for its proposed harvest level and still meet the objectives for integrated management committed to by MB. For this and other reasons set out in this rationale, the AAC determined is lower than that proposed by MB.

Dispersed cut blocks

One consequence of increased recognition of other resource values and IRM is the need for cut blocks to be dispersed on the landscape and to be allowed to "green up" before adjacent cut blocks are harvested.

On TFL 44, progressive clear-cut practices which were commonplace until recently have resulted in relatively large contiguous areas of old-growth stands being left for harvest, together with large contiguous areas of second-growth stands that are mostly not yet old enough for harvest. My personal familiarity with the area informs me that these areas are generally quite separate. This separation reduces the flexibility of dispersing the harvest over the entire operable land base, which in turn reduces the short-term available timber supply.

Despite this current condition of the landscape, all MB's timber supply analysis options assumed instead that harvesting to-date has been dispersed in the old-growth, and that the old-growth forest is thus dispersed within the second-growth forest.

Effects of dispersed cut blocks on short-term timber supply

The transition toward dispersed—or "buffered"—harvest patterns appears to be a major factor affecting the short-term timber supply in TFL 44. These effects become evident from MB's 5-and 20-year plans, as follows.

The 5-year development plans indicate that there is sufficient timber available to harvest at MB's proposed initial rate of 2.68 million m^3/year for at least the next five years.

However, MB's rejected 20-year plan did not support this proposed initial rate, even though its failure to meet several IRM objectives would in effect give MB more harvest flexibility in scheduling individual cut blocks for harvest. I can only conclude that if the IRM objectives were met in the plan, the indicated 20-year timber supply would be still further depressed.

It may be possible for MB to provide the FS with a 20-year plan which both supports the proposed initial harvest rate and meets the IRM objectives, which is why I have stated that in such a case I will be prepared to redetermine the AAC. However, the 20-year plan before me does not indicate sufficient flexibility to sustain the proposed initial harvest rate for five years on TFL 44 without risking either greater harvest reductions in the future or compromised IRM objectives. In view of these significant risks my only prudent choice is to set the AAC at a rate lower than that proposed by MB.

The FS analysis included an option examining potential impacts on timber supply resulting from the transition from a progressive clear-cut harvest pattern to a "buffered" harvest pattern. In this analysis the short-term timber supply is reduced due to the assumption that the remaining old growth forest is contiguous and spatially separated from the second growth forest. This analysis indicated that to avoid future timber supply shortfalls, the initial harvest rate would have to be 2.382 million m^3/year.

I acknowledge that while the old-growth forest is not dispersed within the second-growth forest as assumed in the MB analysis, neither is it entirely separated from the second-growth forest as assumed in the FS analysis. The legacy of the progressive clear-cutting history on the landscape leads me to believe that the AAC should be closer to the initial harvest rate of 2.382 million m^3/year indicated by the FS option than to the 2.68 million m^3/year proposed by MB.

MB's assumption of entirely dispersed operable areas

All the options in MB's timber supply analysis assume that the operable area in the TFL is entirely dispersed in cutblock-sized patches across the landscape. This assumption gives the licensee the greatest amount of flexibility to schedule the harvest of individual cutblocks, and in effect makes more timber available for harvest in the short term. Using this assumption, MB's analysis supports MB's proposed harvest rate of 2.68 million m^3.

However, although the FS was aware of and accepted MB's intention to use this assumption, it is clear to me from physical inspection of the landscape that the operable area is in fact not dispersed as MB assumed. Therefore, while an analysis based on this assumption can provide useful information, the information must be used cautiously. The only prudent course is to conduct a sensitivity analysis to show the impact of assuming that the operable area is not entirely dispersed.

Because the MB timber supply analysis did not provide such a sensitivity analysis, this factor was examined in the FS timber supply analysis, as follows.

The FS analysis included an option which assumed that the operable forest is a large, contiguous patch in the landscape. In contrast to the assumption used in the MB analysis, this assumption provides the least amount of flexibility for scheduling individual cut blocks for harvest. The initial harvest rate for this option had to be reduced to 2.312 million m^3/year to avoid a timber supply deficit in the future.

I acknowledge that the operable area on TFL 44 is neither entirely dispersed nor entirely contiguous. This suggests that the AAC should be set at a level between MB's proposed initial harvest rate of 2.68 million m^3/year and the rate of 2.312 million m^3/year achieved in the FS option.

The range of forecasts considered with respect to dispersed operable areas and dispersed old-growth.

I considered two additional harvest forecast options, one by MB with an initial rate of 2.990 million m^3/year, and one by the FS, with an initial rate of 1.886 million m^3/year. These two forecasts give a general indication of the wide range of sensitivity of the timber supply to simultaneously changing assumptions about the distribution of old growth and operable areas. However, for reasons discussed below, I have confined my consideration to the narrower range of initial rates represented by MB's proposed initial harvest rate of 2.68 million m^3/year and the rate of 2.312 million m^3/year achieved in the FS option described above.

The intent of the MB option was to explore the maximum initial harvest rate that could be achieved on the current land base if the harvest declined to the long-term harvest level at ten percent per decade, rather than six percent as was the case with an initial harvest rate of 2.680 million m^3/year. The forecast is also useful in that it assumes complete dispersal of the operable area in cutblock-sized patches across the landscape, and it assumes that the old growth is entirely dispersed within the second-growth forest. This resulted in the initial rate of 2.990 million m^3/year.

The reason for excluding this initial rate from the range of possible AAC alternatives is because this option does not reflect the biodiversity objectives, it is based on MB yield tables which were not approved, and since the 20-year plan does not support an initial harvest rate of 2.680 million m^3/year, it would be even less able to support 2.990 million m^3/year.

The FS option, in contrast to the MB option, assumed the old-growth forest to be entirely contiguous and spatially separated from the second-growth forest, and assumed the operable forest to be a large, entirely contiguous patch in the landscape. In addition, the assumptions used to reflect biological diversity objectives (see following section) were a particularly stringent interpretation of the wording of the *Guidelines To Maintain Biological Diversity In TFL #44 And TFL #46*, dated December 1991. For this FS option,

the initial harvest rate had to be reduced to 1.886 million m^3/year to avoid future timber supply shortfalls.

The reason for excluding this initial rate from the range of possible AAC alternatives is because, as discussed above, in fact the old-growth forest is not entirely separated from the second-growth forest, and the operable area on TFL 44 is not entirely contiguous. Considering both of these extreme assumptions in combination with the stringent biological diversity assumptions indicates a greater reduction in harvest level than could reasonably be expected.

Biological diversity

The addendum to the MB timber supply analysis contains an option that reflects consideration of the *Guidelines To Maintain Biological Diversity In TFL #44 And TFL #46*, (the *Guidelines*) dated December 1991. MB used its detailed inventory information to determine land base reductions for forest ecosystem networks, and used forest cover constraints to reflect requirements for large-scale habitat diversity. The MB analysis indicated an initial harvest rate for this option of 2.68 million m^3/year.

In MB's analysis for this option, the operable area was assumed to be dispersed in cut-block-sized patches in the landscape. Also, the assumption was made that the old-growth areas on the TFL are dispersed in small patches among the second growth. As noted earlier, my judgement based on personal experience is that these assumptions do not reflect the true landscape of TFL 44, which suggests that MB's proposed harvest rate overestimates short-term timber supply, as was confirmed by the FS analysis.

All the options used in the FS analysis contain assumptions that are meant to reflect objectives for biological diversity. These assumptions are based on FS staff interpretation of the biological diversity *Guidelines*. The FS interpretation was reviewed and verified by the chair of the Coastal Biodiversity Guidelines Committee. The more detailed information used by MB in its analysis indicated that the land base reduction for forest ecosystem networks in the FS analysis may be overstated by up to 7 000 ha. Thus the FS analysis may overestimate the impact of meeting biological diversity objectives, i.e. it may underestimate timber supply. This suggests that the AAC could be somewhat higher than the initial harvest rates determined in the FS analysis options.

The FS analysis explores several options to show the impact on timber supply of different approaches to modelling the objectives for biological diversity. The base case option, or the option used as a basis for sensitivity analysis, assumes that for maintenance of large-scale habitat diversity, four percent of the operable forest must be older than 120 years for the planning horizon (200 years). This requirement is in addition to the old-growth land base reduction (five percent of the operable area) for areas to be protected in the Forest Ecosystem Network. While this assumption does recognize the broad large-scale habitat diversity objective of representing early and later seral stages in the forest, maintenance of eight percent of the operable area older than 60 years is consistent with the wording of the

Guidelines. For this reason additional options are included in the FS analysis that reflect this assumption.

One of these options assumes that, in addition to maintaining eight percent of the operable area older than 60 years, the operable area is contiguous in the landscape and the harvest pattern has changed from progressive clear-cutting to a buffered harvest pattern. The initial harvest rate for this option is reduced to 2.333 million m^3/year to avoid future timber supply shortages. As stated earlier, the operable land base is not entirely contiguous, the old growth is not entirely separated from the second growth, and the land base may be greater than the area used in the analysis. These factors suggest that the AAC should be higher than the initial harvest level indicated by this option.

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

MB's proposals include a component of the harvest to be obtained from non-conventional and marginal areas. This component is proposed to be increased over time. However, at the present time MB's performance in these areas does not meet the level MB has proposed. Because I believe the company has a legitimate potential to perform in these areas, then in order to provide additional timber supply which will lessen the immediate and long-term social impacts of forecast harvest reductions, I have included in the AAC for TFL 44 a partitioned component of the harvest to be obtained from non-conventional and marginal areas.

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

The MB and FS timber supply analyses for TFL 44 indicate that based on the current land base, today's annual harvest rates must decline gradually over about 60 years toward a long-term harvest rate of approximately 1.95 million m^3/year. The FS and MB long-term harvest rates based on the current land base and FS yield figures range from 1.815 million m^3/year to 2.073 million m^3/year depending on the assumptions used.

Timber harvesting in TFL 44 is currently carried out almost entirely in old-growth stands. Harvest forecasts for the TFL must reflect the transition to harvesting in second-growth stands. The existing accumulated volumes of old-growth provide an opportunity in the short term to harvest at rates higher than the long-term sustainable harvest rate, and still meet objectives for other forest resources.

The nature of the transition from harvesting in old- to second-growth stands is a major consideration in determining AACs. 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 harvest rates will be compatible with a smooth and orderly transition to long-term sustainable 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 authority of the Chief Forester to take into consideration social and economic factors in determining AACs for TFLs was confirmed in the Reasons for Judgement of Mr. Justice Smith in his decision of December 22, 1993, dismissing the judicial review application brought by Sierra Club regarding the meaning of the word "sustained" in section 28(g)(i) of the *Forest Act*, as it read prior to the 1992 amendment (this application was heard at the same time as the Ministry's appeal from the Appeal Board's decision). In this regard, I have also considered the requirement for forest management to have regard to long-term social and economic impacts, as provided for in Section 4(b) of the *Ministry of Forests Act*. Mr. Justice Smith also confirmed the appropriateness of interpreting the word "sustained" in section 28(g)(i) as permitting a gradual decline in harvest rates toward long-term rates. In my opinion, his decision is equally applicable to the interpretation of the word "sustained" in section 7.
I am therefore satisfied that the harvest forecasts provided by MB and the FS properly reflect the necessary transition toward second-growth harvesting by showing higher initial rates which gradually decline to long-term sustainable rates, and that as such these forecasts are appropriate for consideration in determining the AAC for TFL 44.

In my judgement the AAC I have determined will meet the objectives for all forest resources while minimising short-term social dislocation and avoiding disruptive shortfalls in future wood supply.

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

The AAC determination has included those types of timber which are capable of being manufactured in regional 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

While the minister has not expressed any specific social or economic objectives of the Crown for TFL 44, the broad social and economic objectives expressed for the province (e.g. continuity of employment, a stable timber supply, good forest stewardship, and a managed transition from old growth to second-growth forests) are factors I consider in any AAC determination.

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

No such situations have been identified.

Technical limitations of the information used

In making this AAC determination I am aware of the technical limitations of the information provided, and have taken these limitations into account.

Inventory and growth and yield data are subject to statistical uncertainty. Likewise, map projections and computer simulations of timber supply are models, or abstractions of reality. As such, they never reflect reality perfectly and they do not necessarily point at the perfect solution to a problem. They do, however, provide valuable insights into potential impacts of different resource-use assumptions and are thus important components of the information which I must consider in AAC determinations.

For this reason timber supply analyses examine the sensitivity of the harvest forecast produced by the model to variations in the information and assumptions used in the computer model. Since it is reasonable to change any of the assumptions within statistical limits of uncertainty, it is impossible to produce one harvest forecast which is more correct than another forecast which is based on different but equally valid assumptions.

For this reason, the determination of an AAC involves informed judgement. Once an AAC has been determined which reflects appropriate assessment of all factors required to be considered, there is no additional precision to be gained by carrying out a specific computer model run at the exact AAC determined.

Decision

Consideration of all the foregoing assures me that an allowable annual cut of **2.45 million m^3** will provide MB with adequate flexibility in scheduling harvests to achieve a smooth transition to second-growth while meeting its integrated resource management commitments.

The AAC I have determined is *higher* than that indicated by the Forest Service (FS) analysis, and *lower* than that proposed by MacMillan Bloedel (MB). For the reasons stated below, I believe the FS analysis *underestimates* the available timber supply, and the MB analysis *overestimates* supply.

The AAC is higher than the harvest levels suggested by the FS analysis options discussed earlier in this document, in order to account for (a) the operable forest not being *entirely* contiguous in the landscape, and (b) for the old growth not being *entirely* separate from the second growth, both of which were assumed in the FS analysis.

The AAC is lower than the 2.68 million m^3/year proposed by MB, to account for (a) the fact that the MB analysis did not reflect the true spatial distribution of operable and inoperable mature-old-growth and second-growth stands, and (b) the fact that the MB 20-year plan did not meet current IRM commitments, or show how these commitments could be met while achieving the proposed harvest level. It was for these reasons that MB's 20-year plan was rejected by the Port Alberni Forest District manager.

To reflect the true separation of old growth from second growth, the AAC should be between the two analysis options provided, i.e. between 2.68 million m^3/year (old growth dispersed) and 2.382 million m^3/year (old growth entirely separated), i.e. approximately 2.531 million m^3/year.

To reflect the true dispersal of the operable forest in the landscape, the AAC should be between the two analysis options provided, i.e. between 2.68 million m^3/year (complete dispersal) and 2.312 million m^3/year (entirely contiguous), i.e. approximately 2.496 million m^3/year.

I was also provided with two FS options which combined assumptions that the old growth is completely separated from the second growth, and that the operable forest is a large contiguous patch in the landscape. These options clearly show that in combination, these factors have a greater impact on timber supply than when taken singly, which indicates that the AAC should be below both 2.531 million m^3/year and 2.496 million m^3/year.

One of these options used MB's less stringent interpretation of the biological diversity *Guidelines*, and examined the same combination of separation and dispersal. To reflect the true separation of old growth from second growth together with the true dispersal of the operable forest in the landscape, the AAC should be between 2.68 million m^3/year and the 2.333 million m^3/year indicated by this option, i.e. approximately 2.506 million m^3/year.

As stated earlier, in my judgement the condition of the forest is closer to having contiguous operable areas with separated old growth. For this reason I have determined an AAC lower than these median values. However, because of the probable overestimation by the FS of the reduction in the land base necessary for areas to be protected in the forest ecosystem network, I have determined the AAC closer to the median figures than the lower FS figures.

The determination of an AAC at 2.45 million m^3 also reduces the risk of a timber supply shortfall in the longer term arising from stands not becoming ready for harvest at the harvest ages used in the timber supply analyses, by providing the flexibility to harvest some older stands at later dates, without incurring undue adverse impacts in the short term.

John Cuthbert
Chief Forester

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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