BRITISH COLUMBIA
MINISTRY OF FORESTS

Tree Farm Licence 54

Issued to International Forest Products Limited

Rationale for allowable annual cut (AAC) determination

effective January 1, 2000

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Table of Contents

Objective of this document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 54.

Description of the TFL

TFL 54, held by International Forest Products Limited (the 'licensee'), is located on the west side of Vancouver Island and lies almost completely (93%) within the area covered by the provincial government's 1993 Clayoquot Sound Land Use Decision (CSLUD).

The Clayoquot Sound area is a complex of mountains, valleys, ocean inlets, lakes, rivers, islands and forests. In recent years plans to integrate resource use with conservation of natural values in the area have attracted international attention. The 1993 CSLUD followed many years of public participation and consultation regarding land and resource use planning in the area. The CSLUD designated portions of Clayoquot Sound as protected areas, special management areas (for recreation, wildlife, or scenic corridors) and general integrated resource management areas. Under the CSLUD, the general integrated management areas were intended to include timber harvesting as a major use.

TFL 54 has a gross area of 60 986 hectares and covers approximately 17 percent of the total area under the CSLUD. Six percent (3651 hectares) of the TFL is on Meares Island and 19 percent (11 951 hectares) are in protected areas, neither of which contribute to timber supply. A further eight percent (4962 hectares) are designated as special management areas for recreation, 19 percent (11 691 hectares) as special management areas for scenic corridors, and 41 percent (24 856 hectares) as general integrated resource management areas. Approximately seven percent of the TFL lies outside the CSLUD.

The TFL also includes approximately 122 hectares of schedule A private land which lies in the CSLUD area. The total productive forest land base in the TFL, exclusive of all protected areas and Meares Island, is 41 049 hectares.

On October 22, 1993, with the objective of defining world-class, sustainable forest practices for the area, the provincial government announced the formation of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (the Scientific Panel). The Scientific Panel was tasked with reviewing the forest practices standards in effect in Clayoquot Sound at that time, and recommending changes to ensure that the practices would be sustainable. On May 30, 1995, the Scientific Panel submitted to government a three-volume report containing a total of 124 specific and 91 general recommendations on forest practices and First Nations issues in Clayoquot. On July 6, 1995, the provincial government issued a joint news release from the Ministry of Forests (British Columbia Forest Service, BCFS) and the Ministry of Environment, Lands and Parks (MELP), announcing acceptance of the Scientific Panel's report and government's intention to fully implement the report's recommendations.

Clayoquot Sound has an extensive First Nations cultural history, and the TFL includes traditional territories claimed by several First Nations represented by the Nuu-chah-nulth Tribal Council. In March 1994, a two-year Interim Measures Agreement between the provincial government and hereditary chiefs of the Nuu-chah-nulth Central Region Tribes was signed, leading to the establishment of the Clayoquot Sound Central Region Board (CRB) as part of a joint management process between First Nations and provincial government appointees, to oversee development in Clayoquot Sound, including implementation of the CSLUD and the recommendations of the Scientific Panel. In April 1996, the agreement was extended for a three-year period as the Interim Measures Extension Agreement (IMEA). It has since been extended to March 2000 and is expected to be replaced with a new agreement in the future. The planning of all operations in the area covered by the CSLUD, including the major portion of TFL 54 which lies in the area, must be reviewed by and coordinated through the CRB.

Simultaneously, government appointed a Clayoquot Sound Implementation Team—which includes representation from the Ministries of Forests; Environment, Lands and Parks; Small Business, Tourism and Culture; and Aboriginal Affairs—to set in motion the implementation of the Scientific Panel's recommendations. This team collaborated with the CRB to develop a planning framework with input from government officials, elected local governments, labour, forest licensees, and environmental groups. This process established the Clayoquot Sound Planning Committee—comprised of the CRB plus one representative from each of the ministries mentioned above—to coordinate all planning activities in Clayoquot Sound in accordance with the recommendations of the Scientific Panel and provincial legislation. Under the direction of this committee, watershed-level plans are to be prepared by representatives of the community, First Nations, the CRB and government, for each of the fifteen watershed planning units delineated in Clayoquot Sound. The 129 watersheds identified in TFL 54 for the purposes of the timber supply analysis are contained in eight of these watershed planning units.

Due to its location, and because the provincial government has accepted that the forests in the CSLUD area will be managed according to the recommendations made specifically for the Clayoquot Sound area by the Scientific Panel, the majority of the TFL is being managed in accordance with these recommendations. This special management has significant implications for a current assessment of the timber supply in the TFL for the present AAC determination, as discussed later in the rationale under Guiding principles for AAC determinations which include portions of Clayoquot Sound. Areas of the TFL outside Clayoquot Sound will be managed in accordance with *the Forest Practices Code of British Columbia Act*, and its associated regulations.

The TFL landscape is dominated by old-growth forests comprised primarily of western redcedar, western hemlock and amabilis fir. The TFL is located in the windward island mountains ecosection and includes parts of the Coastal Western Hemlock and Mountain Hemlock biogeoclimatic zones.

The TFL lies in close proximity to the communities of Tofino and Ucluelet, and the First Nations villages of Hot Springs Cove, Ahousaht, Opitsaht, Esowista and Port Albion.

Clayoquot Sound supports industries which include forestry, fishing, fish processing, mining, and tourism—particularly recreational activities associated with Pacific Rim National Park. In recent years, the integration of appropriate forms and levels of development with the natural values present in the Clayoquot area aroused a high level of public debate and participation in comprehensive planning processes. A proposal to designate the area as an International Biosphere Reserve has been submitted to the United Nations, as is described later in this rationale under *UNESCO biosphere reserve designation*.

The licensee manages operations in the TFL from Ucluelet**,** and the TFL is administered by the BCFS from its South Island Forest District Office in Port Alberni.

History of the AAC

In May 1955, the Maquinna Forest Management Licence (FML) No. 22 was awarded to British Columbia Forest Products Limited. In July 1981, FML 22 was replaced by TFL 22, which was amalgamated in July 1983 with TFL 27 to form TFL 46. TFL 46 was transferred to Fletcher Challenge Canada Limited in September 1988. In December 1991, TFL 46 was subdivided and blocks 4 and 5 (the west coast portion) of the TFL became TFL 54. TFL 54 was transferred to International Forest Products Limited on December 30, 1991.

The AAC set for Management Plan No. 1 for TFL 54 in 1991 was 180 000 cubic metres, of which 8991 cubic metres were allocated to the small business forest enterprise program (SBFEP). In May 1994, the chief forester determined temporary AAC reductions totalling 42 000 cubic metres for the TFL under Part 15 (now Part 13) of the *Forest Act* as an interim measure to account for newly protected areas and anticipated changes to management resulting from the CSLUD. The resulting AAC of 138 000 cubic metres, which included 129 009 cubic metres for the licensee and 8991 cubic metres for the SBFEP, remained in effect until 1996, when a new AAC which included consideration of the CSLUD, was determined for the TFL.

In 1996, a new AAC of 75 750 cubic metres was determined for TFL 54, of which 66 759 cubic metres were allocated to the licensee and 8991 cubic metres to the SBFEP. This represented a decrease of 58 percent from the AAC in effect before the CSLUD, or a decrease of 45 percent from the interim AAC of 138 000 cubic metres resulting from the Part 15 reduction.

New AAC determination

Effective January 1, 2000, the new AAC for TFL 54 will be 75 750 cubic metres, unchanged from the current AAC. This new AAC will remain in effect until a subsequent AAC is determined, which must take place within five years of this determination.

This AAC should not be construed as an input to local planning processes overseen by the Central Region Board, which are intended to identify the specific areas for harvest on which the actual harvest level achieved will depend.

If the anticipated watershed level plans become available, and if a review of these plans identifies enough information for a timber supply analysis that will support an AAC determination based on actual plans rather than on the current, more theoretical interpretation of the recommendations, I may consider redetermining the AAC for TFL 54 earlier than required by statute.

Information sources used in the AAC determination

Information considered in determining the AAC for TFL 54 includes the following:

- Statement of Management Objectives, Options and Procedures (SMOOP) for draft Management Plan No. 3 of TFL 54, submitted March 1998, accepted by the BCFS, January, 1999;
- Existing stand yield tables, accepted by BCFS Resources Inventory Branch, June, 1999;
- Timber Supply Analysis Information Package (IP), submitted March 1999, accepted September 10, 1999;
- Timber Supply Analysis Report for Management Plan No. 3 for TFL 54, submitted March 1999, accepted September 10, 1999;
- Proposed Management Plan No. 3 for TFL 54, submitted June 1999;
- Technical review and evaluation of current operating conditions through comprehensive discussions with BCFS staff, notably at a meeting held in Victoria on September 9, 1999;
- Correspondence and communication between BCFS staff and the licensee on matters related to this determination;
- Discussions between South Island Forest District Staff and the Clayoquot Sound Central Region Board in the spring of 1999**;**
- Summary of stakeholder responses to public involvement initiatives for TFL 54 draft Management Plan No. 3;
- Timber Supply Analysis Report for Management Plan No. 2 for TFL 54, submitted May 1995, by Timberline Forest Inventory Consultants on behalf of the licensee, accepted December 1995;
- Discussions with and presentations to the Clayoquot Sound Central Region Board, on June 19 and September 16, 1996;

- Letter from the chief forester to the Clayoquot Sound Central Region Board, September 4, 1996;
- Letter from Clayoquot Sound Central Region Board to the chief forester, October 1, 1996;
- BCFS area-based, watershed-based Timber Supply Analysis, December 1996;
- *Clayoquot Sound Land Use Decision ¾ Key Elements*, Province of British Columbia, April 1993;
- *Sustainable Ecosystem Management in Clayoquot Sound, Planning and Practices*, Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, Report 5, April 1995;
- Letter from the Minister of Forests, July 28, 1994, to the chief forester, stating the Crown's economic and social objectives (Appendix 3);
- Memorandum from the Minister of Forests, February 26, 1996, to the chief forester, stating the Crown's economic and social objectives regarding visual resources (Appendix 4);
- Letter from the Minister of Forests, September 17, 1996, to the chief forester, stating the Crown's economic and social objectives regarding Clayoquot Sound (Appendix 5);
- *Forest Practices Code of British Columbia Act*, consolidated to June 1999;
- *Forest Practices Code of British Columbia Regulations and Amendments*, consolidated to June 1999.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester 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, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are 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. Timber supply analyses also indirectly incorporate some economic information such as operability classifications that define 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 in part to variation in physical, biological and social conditions—although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

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 complete 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 TFL 54, I have been provided with a BCFS timber supply analysis which is based on the chief forester's interpretation of certain of the Clayoquot Sound Scientific Panel's recommendations. I have also been provided with staff advice and evaluation of the changes in information since the time of the BCFS analysis. In using this information I have considered known limitations of the technical information provided. I am satisfied that, subject to the specific uncertainties and cautions identified throughout this document, the information provided forms a suitable basis for determining a harvest level in accordance with the chief forester's interpretation of the recommendations.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for timber supply areas (TSAs) and TFLs. Section 8 is reproduced in full as Appendix 1.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester which include those required under Section 8 of the *Forest Act*. Consistent with this provision, in a memo dated November 24, 1998, the chief forester requested that I make AAC determinations for a number of TFLs

In this memo the chief forester expressed the importance of consistency of judgment in making AAC determinations. I also recognize the need for consistency of approach. I have observed the chief forester during a number of previous AAC determinations and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have employed them as described below in making my AAC determination for TFL 54.

In particular, I have reviewed the guiding principles set out by the chief forester specifically for areas within Clayoquot Sound. I am in agreement with these principles, and I have therefore adopted and applied them as described in the second part of the next section of this rationale.

Guiding principles

The chief forester has compiled a set of guiding principles for conventional AAC determinations, which I have reviewed, adopted and applied as deputy chief forester in conventional AAC determinations for TFLs. These principles are set out below, followed by an additional set of guiding principles relating specifically to Clayoquot Sound.

Guiding principles for AAC determinations under section 8 of the *Forest Act*

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. When a large number of determinations are made for many forest management units over extended periods of time, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainty.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge—a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester 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 timber supply—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 timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia Act* and its associated regulations (the Forest Practices Code).

The *Forest Practices Code of British Columbia Regulations* were approved by the Lieutenant Governor in Council on April 12, 1995, and released to the public at that time. The *Forest Practices Code of British Columbia Act* was brought into force on June 15, 1995.

Although the Forest Practices Code has been fully implemented since the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in context of the best available information. In making my determination for TFL 54, as deputy chief forester, I intend to follow the same approach.

As British Columbia progresses toward the completion of strategic land use plans, the eventual timber supply impacts associated with the land-use decisions resulting from the various planning processes—including the Commission on Resources and Environment (CORE) process for regional plans, the Protected Areas Strategy, and Land and Resource Management Planning (LRMP) process—are often discussed in relation to current AAC determinations. Since the outcomes of these planning processes are subject to significant uncertainty before formal approval by government, it has been and continues to be the position of the chief forester that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions not yet taken by government. Like the chief forester, I will therefore not consider the possible impacts of existing or anticipated recommendations made by such planning processes, nor attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made a formal land-use decision, it may not always be possible to fully analyze and account for the consequent timber supply impacts in a current AAC determination. In many cases, government's land-use decision must be followed by a number of detailed implementation decisions, such as has been the case with the CSLUD. For example, a land-use decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made it would be impossible to fully assess the overall impacts of the land-use decision. Nevertheless, the legislated requirement for five-year AAC reviews will ensure that future determinations address ongoing plan implementation decisions. However, where specific protected areas have been designated by legislation or by order in council, these areas are deducted from the timber harvesting land base and are no longer considered to contribute to the timber supply in AAC determinations.

Forest Renewal British Columbia (FRBC) funds a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long-term. As with all components of an AAC determination, like the chief forester, I require sound evidence before accounting for the effects of intensive silviculture on possible harvest levels. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much 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 are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine all of the AACs in the province between 1992 and 1996, many of which were outdated. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgment to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, 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.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from recent court decisions including those in the Supreme Court of Canada. The AAC that I determine should not in any way be construed as limiting the Crown's obligations under these decisions, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 54, nor does it authorize any particular on the ground activities. It is also independent of any decision by the Minister of Forests with respect to subsequent allocation of the wood supply.

With respect to future treaty decisions, as with other land-use decisions it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government.

Overall, in making this AAC determination, as the deputy chief forester, I am mindful of the chief forester's obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act*, and of the chief forester's responsibilities under the *Forest Practices Code of British Columbia Act*.

Guiding principles for AAC determinations which include portions of Clayoquot Sound

For determining AACs for areas which include portions of Clayoquot Sound, the chief forester developed specific guiding principles intended to account for the circumstances resulting from the area's complex history of planning and management. He prepared these principles following the CSLUD and government endorsement of the Scientific Panel recommendations, and they have been applied by him in all AAC determinations to date for areas which include portions of Clayoquot Sound. I have reviewed these additional guiding principles—including the methodology which he developed from them—and I have adopted and applied them in this AAC determination for TFL 54, as is discussed further below.

A major consideration in determining an appropriate AAC for TFL 54 is the inclusion, noted previously under 'Description of the TFL', of most of the TFL in the area covered by the CSLUD of April 1993. Also of significance in the determination of an AAC for TFL 54 is the 1995 adoption by government of the recommendations contained in the three-volume report by the Scientific Panel.

The Scientific Panel recommendations included that all forest activities within Clayoquot Sound be based on equal partnership between the Nuu-chah-nulth and the Province of British Columbia. As noted under 'Description of the TFL', the provincial government created the CRB to oversee all development in the CSLUD area. The government endorsement of the Scientific Panel reports as well as the creation of the CRB enabled extensive First Nations involvement in the planning and management of activities in the Sound. The existence of the CRB, and its role in Clayoquot Sound, is another important consideration for the determination of an AAC for TFL 54.

Additionally, in a letter to the chief forester dated September 17, 1996 (see Appendix 5), the Minister of Forests, recognizing the unique and complex history of forest management in the Clayoquot area, expressed as an economic and social objective of the Crown a confirmation of government's intention that timber harvesting continue to be a forest management objective for the Clayoquot area and that this management be carried out in accordance with the Forest Practices Code and the recommendations of the Scientific Panel. In accordance with this, it is appropriate to include in my considerations under section 8 of the *Forest Act* the ongoing implementation of the Scientific Panel's recommendations.

In determining an AAC for TFL 54, in my considerations under section 8 of the *Forest Act*, I will account for known implications of the provincial government's CSLUD and, in view of the social and economic objectives of the Crown as expressed for the Clayoquot Sound area by the Minister of Forests, I will also account as fully as is technically possible at this time for an estimate of the implications of certain of the recommendations of the Scientific Panel.

The timber supply assessment must be based on both the Forest Practices Code and the chief forester's interpretation of specific, and generally more constraining recommendations of the Scientific Panel. Timber supply analysis for all areas for which an AAC must be determined is based on assumptions which are subject to various levels of uncertainty, as discussed previously under 'Guiding Principles for AAC determinations under section 8 of the *Forest Act*'. However, in the case of Clayoquot Sound, I am faced with a greater than average level of uncertainty, in particular given the limited experience we have with implementing the recommendations of the Scientific Panel. Many implications of the recommendations are still unclear and it is difficult to assess the associated timber supply implications. But as far as possible in this AAC determination, I will consider decisions that have been made through the implementation process with the aim of ensuring the allowable harvest level is consistent with the implementation of the Scientific Panel's recommendations.

In 1996, the chief forester determined a new AAC for TFL 54 which considered the CSLUD and the Scientific Panel recommendations as well as the Forest Practices Code. The following paragraphs provide a description of the methodology developed by the chief forester and used during the 1996 determination for TFL 54; this approach was subsequently also applied in the 1996 determination for the Arrowsmith TSA and the 1998 determination for TFL 44. I have reviewed the methodology and found it to be acceptable for the purposes of this determination.

In the rationale for the 1996 determination for TFL 54, the chief forester noted the Scientific Panel's recommendation R7.1 in *Report 5* (pp. 153 and 246), which reads:

> "Adopt an ecosystem approach to planning, in which the primary planning objective is to sustain the productivity and natural diversity of the Clayoquot Sound region. The flow of forest products must be determined in a manner consistent with objectives for ecosystem sustainability. This entails abandoning the specification of AAC as an input to local planning."

and recommendation R7.10 (page 247), which reads:

> "Recognize that the rate (percentage of area cut per unit time) and geographical distribution of timber harvesting are more important determinants than is the volume removed when wood harvest is planned. *After* analysis of resources and development of area-based plans, determine the anticipated annual volumes of timber to be cut for watershed planning units."

And also the July 6, 1995 government news release, which included the following statement:

> "harvesting levels will be based on watershed planning, rather than on a predetermined annual allowable cut".

With respect to the Scientific Panel's recommendation for "abandoning the specification of AACs as an input to local planning", the chief forester noted that in British Columbia wherever possible AACs are already intended to be outcomes of, rather than inputs to, local planning. Nevertheless, this recommendation has been interpreted by some to mean that no AAC at all should be determined for areas managed according to the Scientific Panel's recommendations. The chief forester pointed out that recommendations R7.1 and R7.10 do contemplate determining a flow of timber products and anticipated annual volumes of timber to be cut for watershed planning units, *after* the analysis of resources and development of area-based plans**.**

The Scientific Panel’s recommendations were interpreted by the chief forester to mean that the flow of timber or rate of harvest should be ecosystem-based. As he noted at the time of the previous determination, it will become easier to determine the appropriate rate after more resource information is gathered and watershed-level planning is complete. In this respect, over time the AAC will become a reflection of the planning process. However, acknowledging and respecting the Scientific Panel's report and the ongoing implementation of the recommendations, in British Columbia AACs are statutorily required for all TFLs and TSAs. In particular, the chief forester is required by Section 8 of the *Forest Act* to complete the AAC determination for each TFL at least once every five years.

Moreover, in determining the AAC for a TFL, the chief forester is required by section 8 to consider the timber supply from the whole land base. Thus any AAC determination must include assessment of a harvest level for the entire TFL, which for TFL 54 includes the major portion of the land base which lies within Clayoquot Sound (excluding protected areas).

However, the harvest level determined is not a substitute for local planning in Clayoquot Sound, but is instead established as an average maximum level of harvesting activity to help provide confirmation of sustainability for harvesting in the TFL. The timing and placement of the harvest will be subject to the detailed watershed plans which are not yet complete, as well as to the implementation of numerous other recommendations by the Scientific Panel as overseen by the CRB.

In view of the obligation to consider the contribution to the timber supply from the Clayoquot area in determining AACs for TFLs 44 and 54, and the Arrowsmith TSA, in view of the Scientific Panel's recommendations identified above, and in view of the CRB's ongoing work in implementing the CSLUD and the Scientific Panel's recommendations, the chief forester and his staff had discussions with the CRB during meetings in June, 1996, and again in September, 1996. The purpose of the discussion was to investigate how the legal requirement for AAC determinations for the TSA and TFLs—including establishing harvest levels for areas in Clayoquot Sound—could best be reconciled with the CRB's work. It was the intention of the chief forester for the previous determination, and my intention as deputy chief forester, to acknowledge and respect the CSLUD and the Scientific Panel's recommendations in AAC determinations without prejudice to future management implementation decisions by the CRB.

Following these discussions with the CRB, the chief forester identified a means of estimating the timber supply that reasonably could be expected to result from his interpretation of certain of the Scientific Panel's recommendations, in order to satisfy his obligations under Section 8 to determine the necessary AACs. The chief forester and BCFS staff ensured that the CRB understood and accepted the methodology to be used for the previous determination. It was acknowledged that the method used did not model the results of fully implementing the Scientific Panel's recommendations, but did provide figures which the chief forester believed to be more representative of the outcome of forest management in Clayoquot Sound than would be provided by regular timber supply analysis that did not attempt to take the Scientific Panel's recommendations into account.

At that time, the CRB was concerned that even if the chief forester could find a reasonable means for determining an anticipated level of timber harvesting in Clayoquot Sound, such a level should not become a target on which to base forest planning or management in the Clayoquot area**.** The chief forester clarified in the 1996 rationale for his determination, that in establishing allowable harvest levels in the Clayoquot area it was his intent that the levels determined should be viewed as upper limits, and he recognized that the actual harvest levels attained on the ground were expected to continue to be defined through appropriate planning and consultation, as recommended by the Scientific Panel and implemented by the CRB. As with all AACs, the harvest level determined for TFL 54 was not expected to be used as an input to planning.

The extensive recommendations in the Scientific Panel's report represent a complex and significantly different approach to forest management from that practiced historically in the area. At the time of the previous determination, when the chief forester was required to assess the timber supply capability for the area, many details remained uncertain regarding the impact of the implementation of the Scientific Panel's recommendations.

The full implications for timber supply in the area were thus also uncertain and difficult or impossible to predict by conventional modelling. Nevertheless, the chief forester found it possible to arrive at a reasonable *calculated estimate* of the available timber supply, based on the following generalized interpretation of certain of the Scientific Panel's recommendations.

There were two recommendations by the Scientific Panel which he found most relevant to such an assessment. The first was R3.1 (page 81-82 and 237 of Report 5), which specifies that in any watershed larger than 500 ha in total area, the area cut in a five-year period should be limited to no more than 5 percent of the watershed area, and that for primary watersheds of 200 to 500 ha in total area, the area cut should be limited to no more than 10 percent of the watershed area within a 10-year period. Page 62 of Report 5 discusses a one-percent watershed-based rate of cut as follows:

> "A watershed-based rate-of-cut of 1% per year, while not unequivocally supported by data, appears to meet the needs of ecosystem management with regard to hydrology, habitat, and long-term sustainable wood supply. The rate of 1% per year appears appropriate as derived from hydrological considerations above, but also incorporates concerns about temporal distribution of seral stages for biological diversity and temporal distribution of wood supply for socio-economic stability. The rate is consistent with the ecological desirability of ensuring harvested areas support a range of seral stages with a variety of different-aged forest habitats for wildlife, plants, and other organisms. It also is consistent with principles of sustainable ecosystem management where the intent is to provide a level of harvestable products that can be sustained over the long term (the sustainable long-term timber supply will be lower than historical annual cut levels in Clayoquot Sound)."

The second recommendation referred to by the chief forester, noted at pp 63 and 170-171 of *Report 5*, specifies that at least 40 percent of the forest in a watershed-level planning unit (i.e. all reserves plus forest retained in harvestable areas) should be in age classes 8 and 9 (i.e. over 140 years of age).

Taking these recommendations and the other considerations specified in R3.1 into account, it was possible for him to establish an estimate of the annually harvestable area in the Clayoquot Sound portion of TFL 54, based on the assumption of limiting the harvest to one percent per year of the area while ensuring maintenance of at least 40 percent of the forest in each watershed at greater than 140 years. By assuming an average volume of timber per hectare, the annually harvestable area so derived could then be converted into an annually harvestable volume of timber. Since most of the TFL (93 percent) lies within the CSLUD, the licensee agreed to accept the use of this method to determine timber supply for the whole TFL, although those parts of the TFL lying outside the CSLUD are managed to meet the requirements of the Forest Practices Code, rather than the recommendations of the Scientific Panel.

As mentioned previously, the assumptions made by the chief forester regarding the Scientific Panel's recommendations, and the appropriateness of his proposed methodology for assessing the timber supply, were discussed in detail with the CRB prior to the last determination. With the acknowledgement that this approach did not explicitly model the results of fully implementing the Scientific Panel's recommendations, and with the reservation noted previously concerning the use of harvest levels in planning, the CRB advised that they believed these assumptions would provide a more reasonable basis for assessment of the timber supply in the Clayoquot area than would a conventional timber supply analysis that could not account for the Scientific Panel's recommendations.

As deputy chief forester, I have considered all of the information presented above in my review of the suitability of the approach taken by the chief forester in 1996 to determine the AAC for TFL 54.

In weighing the options, I have in particular considered the appropriateness of conducting at this juncture a more traditional timber supply analysis for TFL 54. In the preparation of the information for this management plan, the licensee proposed that the methodology used by the chief forester in 1996 be again applied for this determination, and for the entire TFL including that portion outside the CSLUD. BCFS staff reviewed the information that has become available since the previous determination and recommended against adopting a different approach at this time for assessing the timber supply for TFL 54.

I note that at the present time, there is much uncertainty around the assumptions which would be applied in a conventional timber supply analysis for TFL 54. I also find from review of the methodology employed in the previous determination that it provides an evaluation of timber supply which considers the unique nature of Clayoquot Sound, including the more stringent restrictions on hydroriparian and other values in the area contained in the Scientific Panel recommendations. I am satisfied that the methodology applied for the previous determination provides a sound basis on which to base my current determination. I also believe that the harvest level prescribed by the analysis does not pose any undue risk to resources in Clayoquot Sound. I believe that any attempt to carry out a more conventional timber supply analysis at this time would not provide any greater certainty of information for the purposes of making a determination than does the existing analysis.

With respect to the role of the CRB in Clayoquot Sound, I note that for this determination, BCFS staff discussed the use of the same methodology as applied in the previous determination with the CRB co-chair. Given that the same approach was to be used, and given that meetings had been conducted with the CRB on previous occasions regarding this same methodology, it was agreed that it was not necessary to again meet formally with the CRB for the purposes of this determination.

As with all AACs, and as noted previously, the harvest level determined for TFL 54 is not expected to be used as an input to planning. It is essential that the licensee and BCFS district staff continue to work closely with the CRB to ensure that all timber harvesting in the Clayoquot area is a result of, and conforms to, appropriate local planning and forest practices as recommended by the Scientific Panel.

Application of the Scientific Panel's recommendations in timber supply analysis

The Scientific Panel's recommendation R3.1 referred to in the previous section could be interpreted in several ways, that is as permitting the harvesting of one percent of: (a) the total land area; (b) the productive forest area; or (c) the timber harvesting land base.

Two factors were persuasive in the chief forester's decision to adopt the timber harvesting land base, rather than the productive forest or the entire land base in each watershed, as a basis for calculating the harvestable area.

First, the timber harvesting land base was the only alternative that took into account some of the historic environmental and economic limitations on harvesting. While it was not possible to account for all of the Scientific Panel's recommendations, it was apparent that many of the recommendations would result in significant limitations on the amount of timber that could be harvested in any year. In particular, the timber harvesting land base would likely be smaller than that assumed under previous management guidelines. Thus, while the Scientific Panel recommendations on the rate-of-cut by watershed appear to apply to the total area in the watershed, the chief forester believed that the combined impacts of the many recommendations of the Scientific Panel would result in a much smaller harvest level than would be indicated by one percent of the total area.

Second, application of the rate of cut recommendations to either (a) or (b) would in fact lead to a harvest level for the TFL higher than the AAC in effect at the time of the 1996 determination. The harvest level would also be higher than the timber supply projected by the licensee's last conventional analysis for the same area, which was based on the management assumptions in place prior to the Scientific Panel's recommendations. The chief forester considered this to be inconsistent with the principles underlying the Scientific Panel's recommendations, particularly in view of the Scientific Panel's statement (p. 62 of Report 5) that "the sustainable long-term timber supply will be lower than historical annual cut levels in Clayoquot Sound".

In contrast, application of the one-percent-rate-of-cut recommendations to (c) the timber harvesting land base in each watershed resulted in a harvest level that avoided these inconsistencies with the Scientific Panel's recommendations.

The chief forester therefore decided to use one percent of the timber harvesting land base in each watershed as a basis for assessing the timber supply for areas in Clayoquot Sound, and in this case, for the entire area of TFL 54. BCFS staff discussed the three interpretations with the CRB, and the CRB agreed with the view of the chief forester that the application of the one-percent limit to the timber harvesting land base best reflected the overall intent of the Scientific Panel's recommendations.

In conclusion, the interpretation enabled the chief forester, in the 1996 AAC determination for TFL 54, to include an assessment of an average maximum harvest level which considered the CSLUD and the Scientific Panel's recommendations. As discussed in the preceding sections, I have reviewed the chief forester's interpretation of the recommendations of the Scientific Panel and found that it is reasonable and suitable for use in this AAC determination.

The role of the base case

The role of the base case in conventional AAC determinations

The timber supply analysis base case has a specific role in conventional AAC determinations, as is described below.

In considering the factors required under Section 8 to be addressed in AAC determinations, I am normally assisted by timber supply forecasts provided to me through the work of the Timber Supply Review project for TSAs and TFLs. For TFLs, the analysis work is carried out by the licensees and reviewed and approved by BCFS staff.

For each AAC determination the timber supply analysis is carried out using a data package of information from three categories: land base inventory, timber growth and yield, and management practices. Using this set of data, and a computer model, timber supply forecasts are produced. These typically include sensitivity analyses to assess the timber supply effects of uncertainties or changes in various assumptions around a baseline option, normally referred to as the 'base case' forecast. In the case of TFL 54, a unique area-based, watershed-level analysis was carried out by the BCFS, and I have utilized this analysis as a base case against which to test assumptions—as with any base case applied conventionally in a section 8 determination—in my determination for TFL 54.

The base case forecast may incorporate information about which there is some uncertainty. Its validity—as with all other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer model used to generate it. Therefore, much of what is detailed in the considerations in a rationale for an AAC determination 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 the resulting predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation. In the AAC determination for TFL 54, this principle has been applied in examining the assumptions in the area-based analysis.

These adjustments are made on the basis of informed judgment, using current available information about forest management, which may well have changed since the information package was assembled. Forest management data is particularly subject to change during periods of legislative or regulatory change, such as the enactment of the Forest Practices Code, or during the implementation of new policies, procedures, guidelines or plans.

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 a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgments that may, in part, be based on uncertain information are essentially qualitative in nature and, as such, subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained

by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

The role of the base case in Clayoquot Sound AAC determinations

For Clayoquot Sound, a unique history of forest management and planning has led to a different approach to timber supply analysis (as was described under 'Guiding Principles') from that typically taken for other TSAs and TFLs. The uncertainty identified in the chief forester's 1996 AAC rationale for TFL 54—regarding the effects that implementation of the Scientific Panel recommendations will have on the amount of area available for timber harvesting and on management practices—still exists.

Watershed level plans are currently being prepared for the first four of the fifteen watershed units identified in Clayoquot Sound. Their implementation—as well as the eventual preparation of the remaining plans—should provide more certainty around the assumptions regarding land base inventory, timber growth and yield, and management practices, for use in future timber supply analyses for the Clayoquot area.

For this determination, in view of the current ongoing uncertainties, and as discussed previously, I consider that the BCFS area-based analysis used by the chief forester for his 1996 determination still provides a reasonable basis from which to assess timber supply.

The BCFS area-based, watershed-level analysis conducted for the 1996 determination of the AAC is discussed below. The chief forester used this analysis as the base case projection against which to test assumptions, as with any base case applied conventionally. I find this approach to be reasonable for this determination, given the uncertainty in assumptions that will remain until the watershed level plans are completed and implemented.

Timber supply analysis

Timber Supply Analysis for Management Plan No. 2 (1995)

As part of Management Plan No. 2, a timber supply analysis typical of most analyses provided in the Timber Supply Review process was prepared for TFL 54 by Timberline Forest Inventory Consultants and submitted in May 1995. This submission was almost concurrent with the April 1995 release of the Clayoquot Sound Scientific Panel's recommendations. The assumptions in the conventional analysis were not consistent with the Scientific Panel's recommendations; however, the analysis formed a valuable basis for the subsequent area-based analysis carried out by the BCFS in an attempt to model the timber supply implications of the recommendations of the Scientific Panel.

For the purposes of the previous determination, the licensee agreed to accept the use of the BCFS area-based analysis to determine timber supply for the whole TFL, although those parts of the TFL lying outside the CSLUD are being managed to meet the requirements of the Forest Practices Code, rather than the recommendations of the Scientific Panel.

Based on the chief forester's interpretation of certain of the recommendations of the Scientific Panel, a calculation was applied to the timber harvesting land base during the BCFS analysis. The total area of productive forest in the TFL was first identified. Areas normally excluded from harvesting for reasons such as inoperability, environmental sensitivity or riparian reserves were deducted from the productive forest to derive the timber harvesting land base. A GIS-based overlay of the 302 watersheds in Clayoquot Sound (which are dispersed into fifteen watershed-planning units, as described in 'Description of the TFL') was then superimposed on the TFL area to identify a total of 129 watersheds in TFL 54. The forested area in each watershed was assigned to ten-year age classes, based on stand age, and the area in the timber harvesting land base in each watershed was determined.

I note that the information used in the derivation of the timber harvesting land base for the purposes of the 1996 determination, inadvertently did not include the not-satisfactorily-restocked areas. The implications of this omission in the derivation of the timber harvesting land base will be discussed later in this rationale under Expected time for re-establishment.

In the analysis, consistent with the Scientific Panel's recommendation, old-growth forests (older than 140 years) were required to cover at least 40 percent of the total forested area in each watershed at all times. In some cases, given the large amount of forested area, this requirement was met completely from outside the timber harvesting land base. In other cases, a contribution was required from the timber harvesting land base in addition to the areas already excluded from harvesting for other reasons. This was a limiting factor on timber supply in only 7 of the 129 watersheds in TFL 54. In the base case, none of the watersheds with less than 40 percent old growth actually contribute to the harvestable area derived.

After the forest cover requirement for 40 percent old growth was applied, one percent of the remaining timber harvesting land base in each watershed was calculated.

On a watershed-by-watershed basis, a reduction was then calculated in order to account for the influence of the last ten years of harvesting, as follows:

- the area covered by stands of trees less than ten years of age was determined;
- this area was then assumed to be covered with an equal distribution of stands in ten one-year age classes;
- ten percent of the total area less than ten years of age was then subtracted from the one percent of the timber harvesting land base.

It was assumed that this step would account for anticipated delays in harvesting in watersheds which have already been harvested in excess of the recommended rate-of-cut, and which require, in accordance with recommendation R3.1, completion of 'a watershed sensitivity analysis and stream channel audit', or in which 'significant hydrological disturbance, substantial or chronic increase in sediment yield, or significant deterioration in aquatic habitat' are identified.

The TFL area (excluding Meares Island and all protected areas) covered approximately 45 384 hectares. The current timber harvesting land base assumed in the analysis—

exclusive of the not-satisfactorily restocked areas as explained later in this rationale—covered 23 340 hectares. In the analysis, applying the one percent per year harvestable area on a watershed basis, reduced by ten percent of the area less than 10 years of age in each watershed, and in conjunction with the minimum 40 percent old growth forest cover requirement, resulted in a figure of approximately 125 hectares which could be harvested annually.

This figure was then converted into an annually harvestable volume. To do this, an area-weighted average volume per hectare was calculated for stands older than 140 years of age on the timber harvesting land base, as is described in this rationale under *volume estimates for existing old-growth stands*. The average volume so obtained was 606 cubic metres per hectare, which when multiplied by the annually harvestable area resulted in a total annually harvestable volume of 75 750 cubic metres.

Timber Supply Analysis for Management Plan No. 3 (1999)

To the extent possible, and as I have considered it appropriate, the area-based analysis performed in 1995 has again functioned in this determination as a 'base case' harvest level against which to test certain assumptions about forest management. The methodology used to apply the Scientific Panel's recommendations in the BCFS area-based analysis is described in the previous section. As was the case for the 1996 determination, the licensee again agreed to accept the use of the BCFS area-based analysis to determine timber supply for the whole TFL.

As discussed previously, the analysis which provided a basis for the assessment of timber supply in TFL 54 differed substantially from those which are conventionally employed in other areas of British Columbia, in that it was designed specifically for use with requirements interpreted from certain of the Scientific Panel's recommendations for Clayoquot Sound.

Given the unique nature of the CSLUD, combined with the fact that no watershed level plans are yet in place, and better information regarding the resources of Clayoquot Sound is not yet available, I am satisfied that further timber supply analysis at this juncture would not add any useful precision in the determination of an AAC for the TFL area**.**

BCFS staff from the South Island Forest District discussed the approach to be taken during this determination with the CRB co-chair. The CRB co-chair concurred with the approach taken during the last determination.

Consideration of factors as required by Section 8 of the *Forest Act*

The *Forest Act*, Section 8 (8)

In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must 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,

Land base contributing to timber harvesting

As part of the process used to define the timber harvesting land base, (i.e. the land base estimated to be economically and biologically available for harvesting), a series of area deductions was made from the productive forest. These deductions account for factors which reduce the forest area available for harvesting for economic or ecological reasons. In timber supply analysis, assumptions and if necessary projections must be made about these factors prior to quantifying appropriate areas to be deducted from the productive forest area in order to derive the timber harvesting land base.

Some areas may have more than one classification; for example, environmentally sensitive areas may also lie in riparian areas. Hence, the figure shown for a given category in the netdown table in a timber supply analysis or mentioned in the AAC rationale does not necessarily reflect the total area with that classification; much of it may have been deducted earlier for other reasons.

The total area of the TFL, including area on Meares Island and areas protected under the 1993 CSLUD, is 60 986 hectares. The current timber harvesting land base derived during the analysis for TFL 54 was 23 340 hectares, after deductions in respect of factors noted in this section.

Although the BCFS analysis used information in the determination of the timber harvesting land base which was prepared prior to the proclamation of the Forest Practices Code and prior to the publication of the recommendations of the Scientific Panel, BCFS staff advise me that the respective reductions do in fact approximate what is required under the Forest Practices Code.

As discussed elsewhere in this rationale, the recommendations of the Scientific Panel and the creation of the CRB have led to an extensive, detailed planning process for Clayoquot Sound, which is anticipated to produce watershed-level plans to direct operations in the Sound. These watershed-level plans will provide detailed information about all resources in the area and will include mapped reserves which will undoubtedly be different from the reductions applied to derive the timber harvesting land base in the base case for the BCFS analysis.

I acknowledge that it is apparent better information will become available over time which will enable a more detailed timber supply analysis with a more accurately defined timber harvesting land base. However, in the current absence of these planning results, the application of the watershed-based, area-based, one percent rate-of-cut, in conjunction with the 40-percent old-growth requirement, is intended to ensure an appropriate balance between ecosystem integrity and long-term sustainable wood supply.

Moreover, the chief forester's application of the recommendations to the timber harvesting land base, rather than the entire land base, or the productive forest land base, of the area ensures considerable flexibility to accommodate changes in information.

I am therefore satisfied that the methodology used to derive the timber harvesting land base for the purposes of this determination, which is based on the chief forester's interpretation of the recommendations of the Scientific Panel, does not pose a risk to either the long-term, sustainable timber supply, or the resource values in Clayoquot Sound.

- *Meares Island*

Since 1985, Meares Island has been subject to a court injunction preventing all timber harvesting on the island. In 1994, the court action was adjourned indefinitely with the injunction in force.

Meares Island was not included in the provincial government's 1993 CSLUD, although it is intended that a watershed level plan be completed for the area in accordance with the recommendations of the Scientific Panel.

In my guiding principles for AAC determinations, I indicate that in the absence of any formal designation of protection, such an area would normally be considered to contribute to timber supply. However, in view of the longevity of this injunction, in this AAC determination I have assumed no timber supply contribution from Meares Island in order to ensure that the continued avoidance of harvesting on the island will not result in an increased rate of harvesting elsewhere in the TFL.

Under the Clayoquot Sound planning framework, Meares Island is designated as one watershed planning unit. The watershed-level plan for this area has not yet been initiated. No change is expected for the status of this area in the short-term. Should the watershed-level plan be completed in the future, and should the injunction be removed, this area may once again contribute to timber supply and be factored into future analyses. For the purposes of this determination, I am satisfied that there are no risks posed to timber supply as a result of the assumptions used in the analysis.

The exclusion of Meares Island results in a reduction of 3651 hectares to the land base of TFL 54.

- *protected areas*

The 1993 CSLUD brought the total of protected areas in the entire Clayoquot Sound area from 39 100 hectares to 87 600 hectares, or 33.4 percent, including portions of TFL 54, TFL 44 and the Arrowsmith TSA. Protected area status was assigned to 11 951 hectares of TFL 54. Although these areas have been officially protected through orders in council, they have not yet been formally removed from the TFL.

In the analysis these areas were excluded from contributing to the timber supply for TFL 54.

In accordance with my guiding principles, I am satisfied that the protected areas are appropriately excluded from the productive forest land base and I have assumed no contribution to the timber supply from any protected area.

The TFL land base net of reductions for protected areas and Meares Island is 45 384 hectares.

- *non-productive areas*

Non-productive areas include non-productive forest as well as non-forested areas such as lakes, swamps and rock. In the base case for TFL 54, a total of 4335 hectares were excluded from the land base to determine the total productive forest area of 41 049 hectares. BCFS staff have reviewed this information and state that it is an appropriate reflection of non-productive areas in TFL 54.

I accept that there has been an adequate accounting of non-productive areas on TFL 54 for the purposes of this determination.

- *non-commercial reductions*

A total of one hectare on TFL 54 was identified as occupied by non-commercial brush species, and it was removed from the productive forest land base.

- *economic and physical operability*

Those portions of the TFL which are not physically accessible for harvesting, or which are not feasible to harvest economically, are categorized as inoperable and are excluded when deriving the timber harvesting land base.

Operability mapping, including consideration of both economic and physical operability, was completed for the TFL in 1992 and was accepted by Port Alberni (now South Island) Forest District in 1993. A total of 13 420 hectares, including low productivity sites, were identified as inoperable.

The current timber harvesting land base of 23 340 hectares is comprised of approximately 75 percent conventionally operable, 14 percent marginally operable, six percent operable by helicopter, and five percent operable from shoreline.

The areas delineated by the shoreline operability class are adjacent to fresh or salt water and can only be accessed from the water. Prior to the release of the Scientific Panel

report, timber harvesting was expected to occur in the shoreline operability class areas. However, currently, in accordance with the recommendations of the Scientific Panel, a reserve of between 100 and 150 metres is maintained operationally along shoreline areas in the TFL.

Given the absence of definitive information from the watershed level plans, it is impossible to speculate on the size and extent of the availability of these areas for timber harvesting. On the one hand, it is possible that these areas will be entirely comprised of hydroriparian reserves and unavailable for timber harvesting. On the other hand, it is possible that as innovative forest practices are implemented throughout Clayoquot Sound consistent with the Scientific Panel's recommendations, an acceptable means for developing some of these areas will be found.

I am mindful of the uncertainty in the size of the land base—for example, the amount of area in the shoreline operability class—that will eventually be available for timber harvesting. Nevertheless, as described previously, I am satisfied that use of the derived timber harvesting land base, coupled with limiting the annual harvest to one percent of this land base, provides a suitable basis for this determination. As the watershed level plans become available, and as more experience is acquired in implementing the recommendations of the Scientific Panel, it will be possible to obtain more quantifiable information.

- *roads, trails and landings*

During timber supply analysis, a percentage of the productive forest considered available for harvesting is removed to account for the loss of productive forest as a result of the construction of roads, trails and landings.

All roads in existence within TFL 54 at the time of the last analysis were classified and delineated within the inventory file. The three-percent reduction applied to account for existing roads, trails and landings was derived following discussions between the licensee and the BCFS. Given that these existing roads are found almost entirely within stands less than 60 years of age, the value of 3 percent was applied to only that portion of the timber harvesting land base found in these age classes. The total area in TFL 54 determined to be occupied by existing roads, trails and landings was 208 hectares.

District staff noted that the figure applied for existing roads is lower than the corresponding figure for the adjacent Arrowsmith TSA. However, they are satisfied that the reductions are appropriate and reflective of the existing roads within the TFL, in particular given such factors as the licensee’s road deactivation history and the current use of primarily cable logging systems in the TFL.

Due to the unique nature of the analysis—deriving a harvest level based on one percent of the current timber harvesting land base being available for harvest annually—no reductions were applied during the derivation of the timber harvesting land base to account for future roads. Operationally, road construction over the past three years has resulted in the loss of less than 10 hectares of the timber harvesting land base. In addition, I anticipate that the generally more restrictive practices within the CSLUD area

will continue to lead to lower net losses to roads over time. For the relatively short time period during which this more theoretical form of analysis is to be used, I am satisfied that there is minimal risk to the calculated short-term timber supply as a result of future construction of roads, trails and landings. I expect further clarity when the watershed level plans are completed and enough information about the area is available to conduct a more detailed timber supply analysis.

Public comment submitted from Parks Canada requested that any roads providing access to the park boundary be deactivated as soon as feasible. BCFS staff confirm that currently all roads are being managed in accordance with the recommendations of the Scientific Panel, including prompt deactivation where required to provide protection of forest resources. I am satisfied that these concerns are being addressed at the operational level.

I consider the assumptions applied in the analysis for both existing and future roads to be reasonable for use in this determination, and that they pose no undue risk to the short-term timber supply for TFL 54. The information which will become available when the watershed level plans are complete can be incorporated into future analyses.

- environmentally sensitive areas

An environmentally sensitive area (ESA) is an area identified during a forest inventory that is sensitive to disturbance and/or is significantly valuable for fisheries, wildlife, water or recreation resources. ESA values are used where more specific and detailed information is not available about a particular forest resource. Areas can be identified as either very sensitive (E1) or moderately sensitive (E2) to disturbance, and are either entirely or partially removed from the timber harvesting land base, according to their level of sensitivity.

Mapping of ESAs to BCFS standards in TFL 54 was completed and submitted to the BCFS in 1992. The maps were accepted in January 1995 by the Ministry of Environment, Lands and Parks, the Department of Fisheries and Oceans, and the BCFS. The mapping identified areas where soils (Es), recreation (Er), wildlife (Ew) and water quality (Eh) are important considerations. In the timber supply analysis, much of the area was removed through previous reductions applied to the productive forest land base to account for other values. An additional 2970 hectares was removed to account specifically for environmentally sensitive areas.

Detailed inventory information is currently being gathered for the area affected by the CSLUD—as described later in this rationale under Existing forest inventory—which will provide a more current accounting of the areas where other forest management objectives are likely to conflict with timber harvesting. However, the existing ESA mapping was accepted by the reviewing agencies and is currently considered by BCFS staff to be the best information available for this area.

I consider the deductions applied to account for ESAs in deriving the net land base for the analysis, to be appropriate for this AAC determination. I again note that the methodology employed in the analysis to derive an annual harvest area for this TFL is expected to

account for resources such as water quality, recreation and wildlife, and these factors will be discussed in greater detail later in this rationale.

- *low productivity sites reduction*

Sites with low productivity as a result of inherent site factors such as nutrient availability, exposure, excessive moisture, etc. are removed from the productive forest land base. In the timber supply analysis for TFL 54, these sites were included in the inoperable category, and therefore no separate reduction was made on this account.

- *deciduous-leading forest types*

Deciduous tree species are not considered to be merchantable on TFL 54. Of a total of 252 hectares of deciduous-leading stands existing on the productive forest land base, a total of 78 hectares were removed after previous, overlapping reductions. The volumes for the deciduous component of mixed stands were excluded from the existing stand yield tables which were used to derive the average volume per hectare for the TFL.

District staff confirm the appropriateness of these measures since almost all deciduous trees in the TFL occur in riparian and flood plain areas or on landslide tracks, where no harvesting is likely to take place. Furthermore, they indicate that the licensee currently does not target these stands for harvesting.

Given the location of these deciduous stands, I anticipate that they are not likely to be targeted for timber harvesting in the foreseeable future. For the purposes of this determination, I am satisfied that the deductions for deciduous forest types applied in the base case were appropriate.

- *riparian areas*

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian reserve zones that exclude timber harvesting, and riparian management zones that restrict timber harvesting in order to protect riparian and aquatic habitats.

The Scientific Panel Report 5 provided many recommendations pertaining to hydroriparian areas which, when applied to operational management, constrain harvesting in riparian areas more than the Forest Practices Code.

The total area identified for riparian habitat in the previous analysis was 975 hectares, or approximately four percent of the timber harvesting land base. Some of these areas were removed under other reductions, such as for environmentally sensitive areas and inoperability.

There were two land base reductions applied to specifically account for riparian areas. Approximately 267 hectares of stream-buffer zones were excluded from the timber harvesting land base, in accordance with the Coastal Fish Forestry Guidelines (CFFG) in effect when the analysis was initiated. The CFFG were recognized to be not as constraining as the Forest Practices Code. A further review identified an additional

228 hectares of riparian areas in the inventory of Forest Ecosystem Networks (FENs) to be excluded.

I note that the total area identified for riparian habitat in the analysis—975 hectares—when considered as a percentage of the land base, compares closely with the reductions applied to account for riparian values in other coastal units following the implementation of the Forest Practices Code. District staff confirmed that the percentage reduction was representative of Forest Practices Code constraints.

It is apparent that the hydroriparian reserves recommended by the Scientific Panel will result in further reductions to the timber harvesting land base, and I also note that no accounting was made for marine riparian areas. However, the uncertainty in this factor will only be resolved through completion of the watershed-level plans produced by the local planning process. In assessing the validity of the estimate of the timber harvesting land base assumed for the BCFS area-based analysis, I have considered that any additional constraint required in this respect will be accounted for in the application of the Scientific Panel's one-percent-per-year rate of cut restrictions and the requirement to retain 40-percent of the forested area in old-growth. In this respect I am satisfied that the base case for the BCFS analysis adequately accounts for riparian habitat for the purposes of this determination.

Existing forest inventory

- *general comments*

Prior to the CSLUD, the most recent timber inventory for TFL 54 was initiated in 1967 and completed in 1970. In preparation for the previous analysis, the inventory information was updated to June, 1996 for depletion resulting from harvesting, and to December, 1994 for forest growth.

The Clayoquot Sound Scientific Panel Report 5 detailed the inventory requirements necessary to enable an ecosystem-based approach to forest planning as advocated by the Scientific Panel. The report includes information requirements for planning with respect to watershed integrity, biological diversity, cultural values, scenic resources, recreation and tourism.

Much of the detailed inventory work required for the area under the CSLUD has been conducted during the effective period of Management Plan No. 2. The Clayoquot Sound Planning Committee was tasked with coordinating the gathering of inventory information and producing the watershed level plans. The data collected for Clayoquot Sound is still in draft format and so is not available for this determination.

- *age class structure*

Approximately 74 percent of the stands in the timber harvesting land base are 140 years or more in age. A further 24 percent of stands in the timber harvesting land base are less than 60 years of age. Only two percent of stands, or approximately 482 hectares, are currently between 60 and 140 years of age.

- *species profile*

The predominant tree species within TFL 54 are western redcedar, western hemlock, mountain hemlock and amabilis (balsam) fir. Stands are typically composed of mixed species. A small portion of the land base is covered with managed, essentially even-aged Douglas-fir stands less than 60 years of age.

- *site indices and aggregation procedures*

Inventory data includes estimates of site productivity for each forest stand, expressed in terms of a site index. Conventional timber supply analysis depends on values for site index to estimate years to green-up, reductions to the timber harvesting land base for low-productivity sites, minimum harvestable ages, yields in regenerating stands, and growth in existing stands.

In contrast to methods generally used in conventional timber supply analysis, in this analysis the site index classes were used only for the purpose of grouping the stands into analysis units. Site index was not an explicit factor in deriving the existing average old-growth volumes used for the calculation of the annual harvest volume in the analysis.

The original forest inventory file for TFL 54 contained site indices based on five-metre site index classes. These classes and the leading tree species (Douglas-fir, western redcedar, hemlock, hemlock-cedar, hemlock-balsam, or balsam) of each stand were used to group stands into the fifteen analysis units for the TFL. The analysis unit groupings were then used to derive an area-weighted average volume estimate for the existing old-growth stands, as described in the next section of this rationale.

The analysis projects a harvest volume which complies with the recommendations of the Scientific Panel to restrict harvest to one percent of a watershed area per year, given other constraints on old growth retention. The recommendations of the Scientific Panel are interpreted to ensure a sustainable rate of harvest in perpetuity. Given that the rate-of-cut calculation accounts already for sustainable timber supply, the analysis did not attempt to project timber supply over a mid- or long-term planning horizon, and therefore did not account for the rates of growth in young trees which will be harvested in the future.

In the previous AAC rationale, the chief forester noted that the licensee and BCFS Research Branch considered that site indexes for cedar-leading stands were likely underestimated, and the licensee planned to pursue the assignment of new site index values for the TFL prior to Management Plan No. 3. Since any such assignment would only affect regenerated stand volumes for the mid- and long-terms, but not the estimates of old-growth volumes in existing stands on which this and the previous AAC determination for TFL 54 are based, it was subsequently determined to not be a critical factor for this determination.

I am satisfied that the analysis unit groupings used were appropriate, and that they constitute a reasonable means for assessing average existing old-growth volumes (as described in the next section) for the purposes of this determination.

- *volume estimates for existing old-growth stands*

In order to determine an allowable harvest level for TFL 54, it was necessary to obtain an estimate of the average volume per hectare of harvestable timber in existing forest stands greater than 140 years old. This average volume was then multiplied by the derived estimate of the total harvestable area in the TFL.

An average volume per hectare was derived for each analysis unit using data from inventory plots established in stands 140 years of age and older on the timber harvesting land base. The resulting average volume ranged from 268 cubic metres for the poor western redcedar analysis unit to 1051 cubic metres for the good balsam analysis unit.

The following process was used to determine average volume per hectare values. First, the timber harvesting land base occupied by stands 140 years of age and older was determined for each of 15 analysis units (defined previously under *site indices and aggregation procedures*). The plot data from the inventory file for the stands on this portion of the timber harvesting land base, was extracted. The plot data was grouped by the analysis units previously determined for the TFL, and an average volume per hectare for each of the analysis units was determined. The average volume values were then multiplied by the timber harvesting land base area supporting that volume for each analysis unit, and the resulting volume totals were summed to determine a total average volume per hectare for the entire timber harvesting land base portion of the TFL. This produced an average figure of 606 cubic metres per hectare.

This value agreed with the figure accepted for the TFL as a whole by the BCFS Resources Inventory Branch in December, 1995 and again on June 23, 1999.

In many other units in the province, an audit has been conducted to assess the accuracy of the average volume per hectare reported in the inventory. One function of this audit is typically to review the mature component of the inventory to assess the difference between the existing inventory estimate of mean mature volume per hectare, and a new estimate obtained from audit samples. No audit has been conducted to date in TFL 54, and none is planned for the immediate future given the new inventory currently being completed for the CSLUD area through the watershed level planning process.

The licensee has indicated that the volume estimates derived for the analysis are lower than those noted during actual harvests. However, it is not clear whether the licensee's experience is representative of the entire strata used to produce the average volumes for the TFL. The licensee has not provided documentation to support its assertion.

Any possible underestimation in existing stand volumes would result in an underestimation of the timber supply available from the TFL. However, in the absence of any quantifiable information to indicate that stand volumes are underestimated, I accept that the estimates used in the analysis form a suitable basis for my determination.

Expected rate of growth

- *volume estimates for stands aged less than 140 years and future regenerated stands*

Those areas covered with stands less than 140 years of age were not included in the derivation of the volume estimates for existing stands as most of these stands are not expected to be harvested for many years. Any potential uncertainty in these volumes does not affect the estimates of old-growth volumes per hectare used in this AAC determination. The use of the one-percent rate of cut in combination with the 40-percent old-growth retention requirement ensures a long term sustainable timber supply which does not depend on the yields in future regenerated stands, or—at this time—on a contribution from stands aged less than 140 years.

Undoubtedly, future timber supply analyses for TFL 54 will account for volumes attributable to these stands. For the purposes of this determination, I am satisfied that the derivation of volume estimates using only those stands older than 140 years was appropriate.

- *minimum harvestable ages*

A minimum harvestable age is an estimate of the earliest age at which a forest stand has grown to a harvestable condition and has met minimum merchantability criteria. Minimum harvestable age assumptions affect when second-growth stands will be available for harvest.

In TFL 54, given that 74 percent of the stands on the timber harvesting land base are over 140 years of age, it is not expected that any young stands will be harvested in the short-term. Therefore, the minimum harvestable age is not a consideration for assessing the timber supply for the purposes of this determination.

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

Expected time for re-establishment

- *not-satisfactorily-restocked areas and stands less than ten years of age*

Not-satisfactorily-restocked (NSR) areas are those areas where timber has been removed, either by harvesting or by natural causes, and a stand of suitable forest species and stocking has yet to be established. At the time of the previous BCFS analysis, there were approximately 537 hectares of NSR areas in TFL 54. These areas were all considered to be ‘current’ NSR, i.e. areas harvested since 1987. The licensee indicates that since the last determination the NSR area has been reduced to 50 hectares.

As described under ‘Timber supply analysis’, in the BCFS analysis, ten percent of the area covered with stands less than 10 years of age was subtracted from the one percent of the timber harvesting land base assumed to be annually harvestable in each watershed.

In the analysis, the NSR area was inadvertently not included in the data used to determine the allowable harvestable area for each watershed. Consequently, both the area covered with stands less than ten years old and the size of the timber harvesting land base were underestimated in the calculation of rate of harvest for each watershed.

I have reviewed the change in the area covered with stands less than 10 years of age that has resulted from the harvesting and ageing of stands since the last determination in conjunction with the inadvertent exclusion of NSR areas from the estimation of area covered with stands less than 10 years of age. After adjusting for these factors, the area covered with stands less than 10 years of age on TFL 54 has decreased by 67 hectares. I am satisfied that this difference on a TFL-wide level would have minimal impact on the outcome of the analysis for the following reasons:

- as noted above, the analysis was done on a watershed level basis; and
- harvesting has generally been concentrated in the watersheds where a portion of the area is already covered with stands that are less than ten years of age, or the area is NSR. In the analysis, these watersheds would be unavailable for harvest even with the updated information.

As a result, I am satisfied that there is no need to make adjustments on this account for this determination.

In addition, given that the not-satisfactorily restocked areas were not considered in the analysis, the timber harvesting land base was assumed to be 23 340 hectares rather than 23 877 hectares, the latter of which is a more accurate reflection. I note that the 537 hectares underestimation of the size of the timber harvesting land base is very small. In context of the many larger uncertainties associated with the determination for TFL 54, and particularly regarding the generalized nature of the area-based calculation, no useful precision would be added by attempting to isolate and account specifically for the small underestimation in the size of the timber harvesting land base implied by incorporating the omitted NSR area. I have therefore made no adjustments for this factor in this determination.

- *regeneration delay*

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced trees.

The Scientific Panel notes that with the use of variable retention silvicultural systems, regeneration of logged areas is important, but not the dominating objective. The primary objective is to retain natural functions in the managed forest, and to retain the natural range of stand and forest structure. Furthermore, the Scientific Panel states that post-logging treatments must consider objectives other than regeneration and wood fibre production. For example, treatment of logging debris, tree species selection, and precommercial and commercial thinning practices must incorporate biodiversity objectives and visual concerns as well as more traditional silviculture objectives.

The licensee notes in the management plan that silviculture activities will be conducted in accordance with the recommendations of the Scientific Panel.

The Scientific Panel's recommendation R3.17 states that post-harvest silvicultural treatments should approximate natural patterns, including encouraging the regeneration of naturally occurring species mixes as well as limiting prescribing burning to small areas.

The licensee plans to continue planting the majority of harvested sites with ecologically suitable species within one year of harvest. The licensee's current performance in this respect is good and I see no reason to adjust my determination on this account.

- *impediments to regeneration*

In conventional timber supply analysis, evaluation of the impediments to prompt regeneration provides an accounting of the areas where regeneration of trees following harvesting would be difficult, and therefore an assessment of the uncertainty in the values used for regeneration delay and the time to reach a free-growing condition.

This analysis used an assessment of the area less than 10 years of age to approximate limitations on rates-of-harvest in previously logged watersheds. The amount of time for harvested areas to achieve a specific green-up condition is a factor for the purposes of determining the harvestable area. However, I note that this factor acts in a longer term than the five year period for which this determination is intended to be in effect. It is anticipated that the better information expected to be available at the time of the next timber supply analysis will guide us in making any adjustments to conventional assumptions for the purposes of evaluating the timber supply in these areas.

The licensee states in the management plan that there will be no harvesting of areas with potential regeneration problems.

I note that at this time, given the relatively short history we have with the use of variable retention silvicultural systems, that it is difficult to predict the impacts of these systems on regeneration of harvested areas. Should any better information become available over time, such as through the release of the watershed level plans, it can be incorporated into future analyses. For the purposes of this determination, no specific areas of concern were identified and I have made no adjustments at this time to account for areas where successful regeneration of trees is a problem.

(iii) silviculture treatments to be applied to the area,

Silvicultural treatments

- *silvicultural systems*

The Scientific Panel recommends that the use of conventional silvicultural systems in Clayoquot Sound be replaced with the use of the variable retention silvicultural system, which, when compared to conventional silvicultural systems, is intended to preserve, in managed stands, far more of the characteristics of natural forests. The Scientific Panel recommendations allowed for a gradual phasing in of variable retention systems over a five year period, such that 100 percent of the annual area harvested in Clayoquot Sound would be through the use of variable retention systems by the end of 1999.

In proposed Management Plan No. 3, the licensee commits to managing the available timber harvesting land base with variable retention silvicultural systems, consistent with the recommendations of the Scientific Panel. BCFS staff confirm that the licensee is currently conducting all harvesting through the use of this silvicultural system and that this has been facilitated to some degree by the licensee's considerable experience with helicopter logging.

In the analysis for TFL 54, the results of the calculated rate-of-cut are expressed as an annually harvestable volume by multiplying a permitted harvestable area by the average volume per hectare. In deriving this result, the permitted harvestable area represents the aggregated area occupied by the individual trees removed, which is independent of the silvicultural system by which they are harvested.

I am therefore satisfied that the rate-of-cut calculation used in the BCFS analysis accounts adequately for the proposed use of the variable retention system by the licensee, in accordance with Management Plan No. 3 and the recommendations of the Scientific Panel, and that no adjustment is required on this account to the area-based analysis used as a basis for this determination.

- *incremental silviculture*

Incremental silviculture includes activities such as commercial thinning, juvenile spacing, pruning, fertilization and genetic improvement of seed that are beyond the silviculture activities required to establish a free-growing forest stand. The general objectives for conducting incremental silviculture activities are to improve tree growth and quality, through the reduction of competition, increased nutrition, or the modification of tree form.

The licensee has committed in Management Plan No. 3 to conducting incremental silviculture activities if financially and ecologically appropriate. Greater clarity on the role that incremental silviculture will play in Clayoquot Sound will be gained as watershed level planning proceeds and more information is gathered.

Considerations related to incremental silviculture do not affect the assessment of timber supply in the BCFS analysis. I am satisfied for the purposes of this determination that no adjustments are necessary to account for incremental silviculture.

(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,

<u>Utilization and compliance</u>

- *utilization standards*

The standard and level of timber utilization define the species, dimensions and quality of trees that must be cut and removed from the site during harvesting operations. For stands older than 140 years, current utilization standards on TFL 54 require trees to be utilized to

a minimum of 17.5 centimetres in diameter at breast height and to a minimum top diameter of 15 centimetres. Stump height must not exceed 30 centimetres. Logs are rejected if the firmwood is less than 50 percent of the gross log volume. These standards were used during the derivation of the average volume per hectare estimates for the BCFS analysis.

The utilization standards applied during the derivation of the volume estimates reflect current operational standards, and I am satisfied that these are suitable for use in this determination.

- *decay, waste and breakage*

The estimates of existing timber volumes in stands aged greater than 140 years, from which the average volumes were derived for use with the BCFS area-based analysis, were based on direct measurements from field plots and included an allowance for volumes of wood lost to decay, waste and breakage. This allowance was based on information from forest inventory zone B and the Nootka Public Sustained Yield Unit (special cruise 196). The factors used are appropriate for the area and I am satisfied that for the purposes of this AAC determination, no adjustment is required on this account.

(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) objectives

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 and to plan the use of these resources to ensure production and harvesting of timber and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which IRM objectives affect the timber supply must be considered in AAC determinations.

For Clayoquot Sound, the Scientific Panel set forth comprehensive recommendations related to planning for sustainable ecosystem management, and as noted previously in this rationale, the Clayoquot Sound CRB was established as part of a joint management process between First Nations and provincial government appointees, to oversee planning and development in Clayoquot Sound.

In this AAC determination, I have assumed that all planning will proceed in accordance with the Scientific Panel's recommendations, and that all timber harvested will be in accordance with plans developed on the basis of an analysis of resources in the area. I note that extensive data has been collected on the various resources of Clayoquot Sound, with the assistance of inventory funding from FRBC. Although not yet available in a usable format, this information will provide for management of these resources during the implementation of the watershed level plans.

During conventional AAC determinations, the consideration of integrated resource management objectives, and of resources such as visual quality, water quality, wildlife and recreation is necessary to ensure that adequate provisions are made for the protection of these resources and that any corresponding reductions to timber supply are accounted for.

For the BCFS analysis for TFL 54, the one-percent-per-year rate of harvest, in conjunction with the forty-percent old-growth retention, is intended to ensure adequate provisions for integrated resource management objectives as detailed in the Scientific Panel's recommendations. Therefore, in my assessment of the annually harvestable area in the TFL I have made no further allowances for these objectives beyond what was already incorporated—either implicitly or explicitly—in the analysis. However, for purposes of clarity, factors related to integrated resource management are discussed in the following sections of this rationale.

- *cutblock adjacency*

Objectives for forest cover and cutblock adjacency guide harvesting practices in order to address resource values such as wildlife, water and visual quality. Normally, adjacency objectives are modelled in timber supply analysis to address minimum green-up height required before an adjacent area may be harvested as well as the maximum area allowed to be below the minimum green-up height at one time.

The Scientific Panel states in Report 5:

- R3.2 Once an annual rate-of-cut (in hectares per year) from the watershed is determined, no arbitrary limit on the size and adjacency of individual cutting units within a watershed is needed because the rate-of-cut limits proposed (R3.1) restrict the amount and rate of disturbance within a watershed.

The Scientific Panel does note that exceptions to this statement may occur where size and adjacency must be considered in relation to visual landscape management objectives. Visual quality objectives are discussed in the next section of this rationale.

The methodology employed to determine the AAC for the TFL 54 area incorporates consideration of the recommendations of the Scientific Panel—and in particular those under 3.1 which relate to rate-of-cut—to arrive at a rate of cut which is consistent with the intent of the recommendations. I therefore consider that any adjacency requirements are already addressed through the base case and do not require any adjustments for the purposes of this determination.

Public comment from Parks Canada indicated concern about habitat connectedness and clearcuts adjoining other recent logging events. District staff note that the Parks Canada concerns arise from logging which occurred prior to the CSLUD. Given the current exclusive use of variable retention silvicultural systems, the Scientific Panel watershed-based rates of cut and requirements for old growth retention, the adjacency requirements to address Parks' concerns are adequately accounted for in the analysis.

- *visually sensitive areas*

Careful management of scenic areas along travel corridors and near recreational sites is an important integrated resource management objective, and is part of the BCFS mandate to manage the recreation resource. The 1993 CSLUD designated approximately 15 percent of Clayoquot Sound as special management for scenic corridors where protection and management of scenic landscapes was to take priority over other resource activities. In accordance with the land use decision, a scenic corridors planning process was initiated to develop a landscape plan for the scenic corridor areas. It was jointly administered by the Ministries of Forests and of Small Business, Tourism and Culture, and incorporated local knowledge and advice from an advisory group and interagency planning team.

The draft Scenic Corridors Landscape Management Plan was submitted to Cabinet in May 1995. At approximately the same time, the Scientific Panel released its reports which included recommendations about scenic values. The recommendations were determined by government to be consistent with the Scenic Corridors Landscape Management Plan.

The recommendations contained in the Scientific Panel reports regarding scenery, and the methodology detailed by the Scenic Corridors Landscape Management Plan are being incorporated in the watershed level planning for all visually sensitive areas of Clayoquot Sound. This includes areas visible from highways, major waterways and other travel corridors.

In Management Plan No. 3, the licensee commits to employing visual landscape design principles and a variety of visual landscape analysis techniques to plan operations in areas with scenic values, consistent with the watershed level plans, once they become available. Recommendation R3.6 from the Scientific Panel report states “On cutting units with significant values for resources other than timber (e.g., visual, cultural or wildlife resources) or with sensitive areas, implement high levels of retention…”. The areas designated as scenic corridors under the CSLUD have been made known as scenic areas, and are subject to the requirements relating to such under the Forest Practices Code. I note that all harvesting in TFL 54 is by variable retention harvesting systems. Similar systems are used elsewhere in the province to enable harvesting in areas with high scenic values.

In the analysis, no scenic areas were delineated on the timber harvesting land base nor were specific forest cover requirements applied to account for visually sensitive areas. As noted previously in this rationale under *cutblock adjacency*, the Scientific Panel notes that size and adjacency of harvested areas may need to be considered in relation to visual landscape management objectives. However, I am satisfied that the one-percent rate-of-cut restriction, combined with the accounting for recently harvested areas and the maintenance of the 40 percent in old growth which was applied in the base case for the analysis, adequately accounts for the protection of scenic and resource values.

Comments from Parks Canada stated that harvesting in recent years appears to have been heavily focussed along the park boundary which is not supportive of the Scenic Corridors concept. District staff disagree, stating that no recent harvesting has been visible from scenic corridors, and that all harvesting in designated scenic corridors is being done in accordance with the standards outlined for scenic corridors in the reports.

I have considered the information regarding visual quality and conclude that visual quality objectives are accounted for in the application of the rate-of-cut restrictions as applied in the BCFS analysis, and have made no further adjustment to the timber supply as projected in the base case to account for visual resources.

- *wildlife*

The Clayoquot Sound area supports a vast number of wildlife species, including black bear, deer, elk, cougar, and numerous sea animals and birds which depend on the area for habitat. While the biodiversity and riparian provisions of the Forest Practices Code are intended to provide for the needs of many wildlife species, some species that are considered by the MELP Wildlife Branch to be 'at risk' may require special management practices. The province's Identified Wildlife Management Strategy (IWMS) was released in February 1999 and details species throughout the province which require particular consideration. For the TFL 54 area, the following four species are identified by the strategy: Marbled Murrelet, Northern Goshawk, Cassin's Auklet and Keen's Long-Eared Myotis.

Elsewhere in the province, identified wildlife species will be managed through the establishment of wildlife habitat areas (WHAs) and implementation of general wildlife measures. For the Clayoquot Sound area, the watershed level planning process—through the establishment of specific reserve areas in accordance with the recommendations of the Scientific Panel—is anticipated to incorporate the needs of the IWMS.

According to Management Plan No. 3, the licensee will maintain well distributed representative habitats for red- and blue-listed species within the TFL area, consistent with the Scientific Panel recommendation R 7.16, which states 'identify and reserve habitats for species on these lists, recognizing that protection is often better implemented at the site level for widely ranging, rare species, and that planning their protection may occur at the subregional level'.

The timber harvesting land base defined in the analysis excludes areas identified in the ESA inventory where wildlife would be sensitive to timber harvesting. I also note that the methodology employed for the determination of the rate of harvest in TFL 54 likely accounts for any additional management in order to protect wildlife habitat. In summary, I accept that the assumptions used in the BCFS analysis adequately account for wildlife values in TFL 54 and are suitable for use in this determination.

- *community watersheds*

Community watersheds are defined under the Forest Practices Code as the drainage area above a stream that provides water for human consumption and that is licensed under the

Water Act for a waterworks purpose or a domestic purpose. Community watersheds can also be designated as such by the regional manager and a designated environmental official.

Three community watersheds have been designated within the TFL. One is located outside the Clayoquot Sound area, in the Ucluelet District water supply area. Any development in this area will be consistent with requirements under the Forest Practices Code. Of the other two designated watersheds, one is located on Meares Island which, as noted previously under *Meares Island*, is excluded from the timber harvesting land base for this determination. The other community watershed is located above Hot Springs Cove, and no harvesting activities are currently proposed for this area.

For the purposes of assessing the timber supply for TFL 54, the application of the rate of harvest restriction in conjunction with retaining the 40 percent of the area in old growth is assumed to account adequately for the management of community watersheds. I agree with this assessment and have made no adjustments to this determination on this account.

- *recreation*

Recreational use of the Clayoquot Sound area is a significant consideration for planning. The licensee commissioned a recreation features inventory which was completed in 1992 and accepted by the BCFS in 1993. Public comment requested that the licensee make the recreation features inventory available for public review. The watershed level plans are anticipated to contain detailed provisions for the management of the recreation resource in the Clayoquot area.

Parks Canada indicated that visual aesthetics, wildlife and the absence of the sounds of industrial activity are valued and prized by visitors to adjacent park areas.

I am satisfied that the rate-of-cut restrictions in conjunction with the 40 percent old growth constraint in the BCFS analysis adequately accounts for recreation values on TFL 54 in the interim while the watershed level plans are being prepared, and that the information used is suitable for this determination.

- *cultural heritage resources*

Cultural heritage resources include archaeological and traditional use sites. In general, cultural heritage sites occur primarily along marine shorelines, although culturally modified trees (CMTs) can occur in other locations.

No specific reductions were applied to the timber harvesting land base during the analysis to account for cultural heritage resources. It was assumed that the various land base reductions applied for riparian and other considerations, in combination with the one-percent harvest rate and retention of at least 40 percent old growth in each watershed, would account for these areas. Further, as affirmed in the Scientific Panel report the use of retention silvicultural systems facilitates protection of culturally important sites (e.g., culturally modified trees), as well as scenic and recreational values.

The Interim Measures Extension Agreement is an agreement between the Province and the Nuu-chah-nulth Central Region Tribes, and details management of the Clayoquot Sound area. As mentioned earlier in this rationale, this agreement is currently extended and expected to be replaced with a new agreement in the future. The licensee has committed in Management Plan No. 3 to respecting this agreement and its predecessor agreement. Additionally, in February 1997, the licensee and the Ahousaht First Nation signed a working protocol to guide the planning process and the working relationship in TFL 54. The licensee has indicated it will maintain the working protocol, explore effective communication strategies, and cooperate and manage resource values through the assessment and development of management prescriptions consistent with First Nations advice, the Heritage Conservation Act and recommendations of the Scientific Panel.

I note that management practices are generally modified at the operational planning level to account for cultural heritage resources. In particular, the use of variable retention harvesting systems throughout the TFL should adequately account for these values, in the interim until specific information about reserves is available from the watershed level planning process. This, combined with the commitments provided by the licensee in the management plan, gives me confidence that there are no identifiable concerns with respect to cultural heritage values which would impact on the timber supply for TFL 54 as projected by the base case.

Parks Canada provided public comment regarding the importance of protecting European settlement resource values. The commitment on the part of the licensee to manage for all heritage values should provide for the protection of this resource.

I note that the planning committee charged with development of the watershed level plans has representation from First Nations, and the planning framework outlines specific reserves to protect cultural values. Once the watershed level plans are available, it is expected that management in adherence to these plans will provide specific accounting for these values which can be incorporated into future analyses.

- *biological diversity*

Biological diversity, or biodiversity, is the full range of living organisms, in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems, and the evolutionary and functional processes that link them. A major consideration in managing for biodiversity at the landscape level is leaving sufficient and appropriately located mature forests for species dependent on, or strongly associated with, old-growth forests. At the stand level, retention of wildlife tree patches and coarse woody debris are the major biodiversity concerns.

It is assumed in the BCFS area-based analysis for TFL 54 that the application of the Scientific Panel's one-percent-rate-of-cut restriction to the net operable land base, rather than to the gross area in each watershed, combined with the 40-percent-retained-old-growth requirement, will provide sufficient accounting for both stand- and landscape-level biodiversity. Approximately 43 percent of the productive forest land base is excluded from consideration for harvesting even before these constraints are applied.

The analysis also accounts for a reasonable geographic distribution of the retained old-growth, since approximately 95 percent of all watersheds contain more than sufficient old-growth to meet the minimum requirement. That is, the requirement to retain 40-percent of each watershed in old growth limited the available timber supply in only about five percent of the watersheds.

I consider that the base case for the analysis has adequately accounted for biodiversity, and have therefore made no further adjustments.

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

Other Information

- *planning framework*

As mentioned earlier in this rationale, following the 1995 acceptance of the Scientific Panel's recommendations, the CRB and the Clayoquot Implementation Team worked together to develop a planning framework for the area. A Planning Committee—comprised of the CRB and representatives from the Ministries of Environment, Lands and Parks; Forests; Small Business, Tourism and Culture; and Aboriginal Affairs—was created under the framework. The Planning Committee, mandated to coordinate all planning activities in Clayoquot Sound in accordance with the Scientific Panel recommendations and provincial legislation, has established a process for the development of the fifteen watershed-level plans which were recognized by the Scientific Panel as the key long-term planning level.

The first four of these watershed level plans are not yet complete. Once the first plans are available and begin to be implemented, I expect that better information will become available which will enable a more detailed analysis of timber supply. I look forward to this better information for future determinations.

- *undeveloped watersheds*

The watersheds in Clayoquot Sound are considered to be either 'developed' or 'undeveloped', a classification based on the level of previous disturbance as a result of harvesting activity, although the criteria to be applied for classification has been subject to some debate. The Scientific Panel recommendations included delaying road construction or logging activities in all undeveloped watersheds, until appropriate inventories and planning have been completed. Once appropriate inventories and planning have been completed as part of the watershed level plans, it is anticipated that portions of these watersheds will be available to contribute to timber supply.

The BCFS area-based analysis included the timber harvesting land base portion of these watersheds in the calculation of the area available for timber harvesting, since these areas are expected to contribute in the future to timber supply, once the appropriate inventories and the watershed-level plans are completed. The assumption that these areas formed part of the timber harvesting land base—given that they are not designated as protected

areas, and the temporary restrictions on development are expected to be lifted following the availability of the watershed-level plans—is consistent with assumptions used in timber supply analyses for other determinations.

I have reviewed the information regarding these areas which operationally are temporarily excluded from harvesting. I acknowledge that the continued exclusion of these areas might result in increased harvesting pressures in the previously developed watersheds in the Clayoquot area, and as such the assumptions around their contribution to timber supply might over time need to be reexamined. However, as discussed in my guiding principles, I note that the actual harvest levels within each watershed will be determined through local planning processes and eventually through application of the watershed level plans. Furthermore, I am satisfied that the rate-of-cut restrictions and the 40-percent old-growth constraints applied in the analysis ensure that the harvest level projected by the analysis in these developed areas does not exceed what is acceptable based on the Scientific Panel recommendations.

I encourage the completion of the watershed level plans as soon as feasible, such that better information becomes available which may lead to the easing of restrictions on these areas. Harvesting in these areas in the future may alleviate any increasing pressure on the developed watersheds. For the purposes of this determination, I am satisfied that the assumptions used in the analysis were adequate, and have made no adjustments on this account.

- *UNESCO biosphere reserve designation*

At the World Conservation Congress in Montreal in October, 1996, the World Conservation Union passed a resolution supporting the designation of Clayoquot Sound as an International Biosphere Reserve (IBR) under the 'Man and the Biosphere' program of the United Nations Educational Scientific and Cultural Organization (UNESCO). A draft biosphere reserve nomination was completed by a committee of First Nations and local government, ratified by all levels of government in January 1999, and formally forwarded to UNESCO. It is widely considered that many of the land-use and management components already established for Clayoquot Sound satisfy the requirements of an IBR designation.

At this time it is not possible to know with certainty whether the IBR status will be confirmed, but it appears likely that such a designation would include full recognition of the alternative forest management practices currently planned for the area. If the status is confirmed, future analyses will account for any possible changes in management arising from the IBR designation.

- *twenty-year plan*

Twenty-year plans are typically prepared by licensees to outline areas of planned forest development and harvest. The plans provide an assessment of whether the harvest volume projected in the base case can be spatially configured in specific areas of the TFL over a twenty-year planning horizon.

In Clayoquot Sound, extensive planning requirements have been imposed by the CSLUD and the government's commitment to implementing the recommendations of the Scientific Panel, including the creation of a planning committee which does not include representation from the licensees operating in the area. The planning committee has worked within a planning framework to develop the watershed-level plans, the first four of which are almost complete. However, the licensee has stated that it is unable to prepare a twenty-year plan until the watershed-level plans are complete, and in particular because they have been excluded from the current planning process. BCFS staff agree with the licensee's assessment and there is no expectation for such a plan until sufficient information from the watershed level plans becomes available.

- *harvest profile*

The harvest profile indicates whether current harvesting activity is in all timber types across the timber harvesting land base. Inconsistencies between what is assumed during analysis – e.g., that harvest is occurring equally in various types of stands – and what is happening operationally can result in instabilities in available volumes over the planning horizon. For TFL 54, the base case used an average volume of all old growth stands on the timber harvesting land base in the derivation of the harvestable volume. This assumes that over time, the entire profile of old-growth stands is being harvested.

I note that the licensee has committed to conduct harvesting operations in accordance with the recommendations of the Scientific Panel. The recommendations of the Scientific Panel regarding variable retention harvesting include retention of a representative cross-section of species from the original stand. The licensee further commits in Management Plan No. 3 to disperse harvesting in order to achieve watershed based rate-of-cut objectives. District staff do not identify any concerns with the profile of the timber currently being harvested in TFL 54.

I anticipate that the watershed level plans will provide more detailed information about the flexibility around harvest profiles. Further, the location of harvest in the future will be dictated by the watershed plans. I have considered the information regarding harvest profile and conclude that the assumptions from the base case are appropriate for the purposes of this determination.

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

Implications of alternative rates of harvest

As noted in Application of the Scientific Panel's recommendations in timber supply analysis, the Scientific Panel's recommendation R3.1 was not definitive in specifying the area to which the rate of cut recommendations should be applied.

For the reasons noted in the referenced section, in the BCFS area-based analysis the one-percent annual harvest limit was applied to the timber harvesting land base. The chief forester in his previous determination considered that this best reflected the overall intent of the Scientific Panel's recommendations. I concur with his assessment. The BCFS area-

based ‘base case’ analysis resulted in a total rate of cut from all watersheds in the TFL of 125 hectares per year. Multiplying this figure by an average volume per hectare of 606 cubic metres for the timber harvesting land base resulted in an annually harvestable volume of 75 750 cubic metres.

For the reasons noted in this section and elsewhere in this rationale, I have accepted the results of the BCFS area-based analysis as a suitable point of reference for my AAC determination. In this determination I have examined whether any factor required to be considered under Section 8 would necessitate an adjustment to the harvest level indicated by this analysis.

I expect that once the watershed-level plans currently under development through the Clayoquot Sound planning framework are available, the planned location of the harvests will permit a more accurate determination of the overall actual harvest level to be achieved in the TFL.

- difference between AAC and actual harvest (entire TFL)

The table below shows the difference between the AAC and the actual volume harvested in TFL 54 in each of the past seven years. The chargeable cut numbers in the table are entirely attributable to the licensee, as none of the volume allocated to the SBFEP in TFL 54 has been awarded or harvested since the issuance of the TFL in 1991.

Year	AAC (m^3)	Licensee allocation (m^3/yr)	chargeable cut (m^3/yr)
1992	180 000	171 009	174 692
1993	180 000	171 009	120 892
1994	138 000	129 009	82 472
1995	138 000	129 009	100 114
1996	138 000	129 009	39 740
1997	75 750	66 759	65 441
1998	75 750	66 759	7 122

Some of the 1995 chargeable cut is attributable to the yarding and scaling of wood felled in earlier years.

The 125 hectares assessed in the BCFS analysis as annually harvestable in the TFL compare to figures for the total area harvested by the licensee in the Clayoquot Sound portion (93 percent) of the TFL as follows:

Year	1993	1994	1995	1996	1997	1998
area logged (hectares)	87.4	120.2	78.3	44.8	70.4	0

I have reviewed with district staff the information regarding the difference between the AAC and the actual rates of harvest in TFL 54, and I conclude that the differences are attributable primarily to the complexity of the planning and administrative requirements associated with implementing the Scientific Panel's recommendations, rather than shortages of suitable timber volumes in the TFL. I encourage the planning committee to complete watershed-level plans as soon as possible to facilitate the planned management of all the resources in the TFL, including the timber resource.

- *community dependence on the forest industry*

The TFL is in close proximity to the communities of Tofino and Ucluelet and the First Nation villages of Hot Springs Cove, Ahousaht, Opitsaht, Esowista and Port Albion. The majority of workers dependent on operations in the TFL live in the community of Ucluelet. All harvesting operations on the TFL are contracted out, and all of the licensee's sawmilling operations are on the mainland. The licensee has seven full-time employees at its office in Ucluelet.

The licensee has downsized its operations since the time of the last determination, and now employs approximately 3200 people provincially, including 700 persons through logging contractors. Logging crews include workers from First Nations, and where possible the licensee has attempted to develop protocol agreements with First Nations to outline the level of interaction. As mentioned under *cultural heritage resources*, the licensee and the Ahousaht First Nation signed a working protocol in 1997 to guide the planning process and the working relationship in TFL 54.

Figures provided to me by BCFS staff indicate that, should the entire AAC from TFL 54 be harvested, it can support a total of 111 jobs, including 34 in Tofino/Ucluelet, 2 in Port Alberni, 25 elsewhere on Vancouver Island, and 43 in Vancouver. There is currently much uncertainty about the ability of the licensee to harvest the current AAC for the TFL.

While I acknowledge the significance of the timber harvest from the TFL to local employment, in my determination I have given primary consideration to the particular social and economic objectives of the Crown for the Clayoquot Sound area as expressed by the Minister of Forests, with respect to government's intention to manage the Clayoquot area in accordance with the recommendations of the Scientific Panel, in recognition of the complex and unique circumstances surrounding the history of development of forest management policy in Clayoquot Sound.

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

Timber processing facilities

Most timber harvested from TFL 54 is sent by log barge to various company sawmills in the Vancouver area. Not all of the wood cut from the TFL goes directly to the licensee's mills; logs graded and sorted as pulp are sold or traded to other companies for sawlogs.

A small First Nations sawmill near Ucluelet (the Toquaht sawmill) was built in 1994 and is run by Toquaht Enterprises Limited. This mill utilizes low grade cedar logs, but very little wood from TFL 54 goes to this mill.

The current AAC from TFL 54 of 75 750 cubic metres represents approximately 2 percent of the licensee's current total allowable annual cut in British Columbia.

From the information presented, I conclude that wood harvested in the Clayoquot Sound area can be utilized by existing mills, and that local mills can also utilize products from the TFL. I have considered the significance to timber processing facilities of the timber harvested from TFL 54 in my determination.

(d) the economic and social objectives of the province, as expressed by the minister, for the area, for the general region and for British Columbia,

Economic and social objectives of the Province

- *Minister's letter*

The Minister of Forests has expressed the social and economic objectives of the Crown for the province in two documents addressed to the chief forester: a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4). The Minister has also expressed the social and economic objectives of the Crown specifically for the Clayoquot Sound area in a letter to the chief forester, dated September 17, 1996 (attached as Appendix 5).

In my considerations for this AAC determination for TFL 54, I have been mindful of the information in each of these documents. However, in view of the more specific nature of the objectives for Clayoquot Sound as expressed in the Minister's most recent letter, I have placed more weight on these specific objectives than on the more general expressions for the province in the other two documents.

In particular, as noted elsewhere in this rationale document, in his memo regarding Clayoquot Sound, the Minister has stated that government recognizes the complex and unique circumstances and history surrounding the development of forest management policy for the Clayoquot Sound, and has accepted the recommendations of the report of the Scientific Panel. The Minister confirmed government's intentions that timber harvesting continue to be one of the forest management objectives for the Clayoquot area and that management of the area be carried out in accordance with both the Forest Practices Code and the recommendations of the Scientific Panel. The Minister

specifically expressed the Crown's intention that these objectives should be taken into consideration in AAC determinations for areas which include portions of Clayoquot Sound.

For this reason the methodology for obtaining a 'base-case' analysis of the timber supply in TFL 54 has differed from that for all management units which do not include portions of Clayoquot Sound. Instead of a computer-generated, volume-based projection of timber supply over time based on data from a range of inputs, the base case analysis for this TFL was produced from an area-based, watershed-level interpretation of specific recommendations by the Scientific Panel, as discussed in Application of the Scientific Panel's recommendations in timber supply analysis and 'Timber supply analysis'. While the harvest level so obtained is not a representation of the result of a complete modelling of all the Scientific Panel's recommendations—which would not be possible given the currently limited operational experience—the result does more closely represent forest management in accordance with the Scientific Panel's recommendations than would a conventional, volume-based analysis. The base case for the analysis is intended to reflect as fully as possible government's objective regarding the Scientific Panel's recommendations.

The objectives of the Crown expressed for the province in the other two documents refer to 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. They also include the statement that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability". The Minister also placed particular emphasis on the importance of long-term community stability and the continued availability of forest jobs. To this end he asked that the chief forester 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 consideration of partitioned AACs.

Although commercial thinning may have future applications in the young, even-aged, second-growth forests in Clayoquot Sound, in the short- and medium-terms, timber supply contributions are assumed from old growth forests only. According to Management Plan No. 3, commercial thinning will be considered to satisfy various resource management objectives and economic objectives. However, no specific plans for this management practice in the short-term were included in the management plan. Should commercial thinning become common practice in TFL 54 the associated impacts on timber supply can be considered in future determinations. The complexity of the issues around forest management in Clayoquot Sound, combined with the uncertain application of activities such as commercial thinning in the alternative forest practices planned for the area, lead me to conclude that any specific consideration of commercial thinning is inappropriate at this time.

I also note that alternative harvesting systems—i.e. silvicultural systems other than clearcutting systems—are now utilized exclusively in Clayoquot Sound. Better information regarding contributions to timber supply from previously uneconomical

areas, as discussed under *economic and physical operability*, will become available as the implementation of the watershed level planning continues. As this information becomes available, it can be factored into future determinations, but given the current level of uncertainty it is inappropriate to consider it further at this time.

- *local objectives*

Both the Minister's letter and memorandum encouraged the chief forester to consider important local social and economic objectives that may be derived from the public input. In the case of TFL 54, I note the long history of public participation in local planning processes which preceded the government's 1993 CSLUD, and the now ongoing public representation in planning through the CRB.

There has been an extensive public review process specifically for TFL 54 for both Management Plan No. 3 and the preceding management plan. Newspaper advertisements were posted and open houses were conducted, and the public was invited to comment on both the statement of management objectives, options and procedures and the draft management plan. Several written responses were received and were responded to by the licensee.

The majority of public comments focussed on the need for sustainable forest practices in the area and the need for secure employment in the future. Several comments received from residents of the area indicated a desire to see more local salvage opportunities for cedar in TFL 54. Some comments denounced any harvesting activities in Clayoquot Sound, and one submission spoke in support of harvesting activities in order to enable the concept of adaptive management.

The public comments received confirm the local interest in the area of Clayoquot Sound and the complexity of the issues around sustainable uses in the area. The ongoing work of the CRB and the eventual release of the first four of the watershed level plans will provide greater resolution to issues of sustainable management for all resources in the area.

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

<u>Abnormal infestations, major salvage programs</u>

- *non-recoverable losses (NRLs)*

Non-recoverable losses are timber volumes destroyed or damaged by causes such as fire, wind or disease which are not recovered through salvage operations. Estimates for unsalvaged losses account for epidemic (abnormal) infestations and for factors that result in losses that are not recovered through salvage harvest programs and are not recognized in yield estimates. Timber losses due to insects and diseases that normally affect individual trees in forest stands (endemic losses) are accounted for in inventory sampling for existing timber yield estimation or through other methods. Several of the forest health factors present in TFL 54, such as hemlock dwarf mistletoe, are endemic and estimated

losses are accounted for in the stand yield tables used to produce average volumes for the timber harvesting land base.

Very few fires have been recorded in the history of TFL 54 and losses due to fires are not expected to be significant in the future. Windthrow is a natural occurrence within the area and is the main contributing factor to non-recoverable losses. The licensee has indicated that management to minimize windthrow in harvested areas will be conducted in accordance with the recommendations of the Scientific Panel.

In conventional timber supply analysis a reduction is applied to the estimated annual harvestable volume to account for non-recoverable losses. This reduction is necessary because the analysis projects a harvest level which can be sustained in the long-term and must account for factors which may act to reduce the available timber supply.

The original analysis provided by the licensee for TFL 54 prior to the CSLUD used an estimate of 0.1 cubic metre per hectare per year to account for non-recoverable losses, which would imply losses of 2388 cubic metres per year over the entire timber harvesting land base, and 12.5 cubic metres per year on the harvested area. The reduction, if applied as in conventional timber supply analyses, results in an impact of 2388 cubic metres or 3 percent on the annual harvestable volume of 75 750 cubic metres. The BCFS area-based, watershed-level analysis did not explicitly apply a reduction to account for non-recoverable losses.

I note that the Scientific Panel makes specific recommendations which are applicable to the consideration of non-recoverable losses, namely:

- R.3.10 Do not salvage blowdown in retention cutting units except where it threatens desired values (e.g., by establishing the potential for unnaturally large or frequent debris flows, especially ones that might threaten special sites such as spawning areas). Areas of blowdown provide live trees, snags, downed wood, or wood in streams which are habitat for may organisms in present and future stands. Abundant coarse woody debris is an important element in the forests and stream channels of Clayoquot Sound; its removal is potentially disruptive to the objectives of retention and, in most cases, is unnecessary.

Further, the Scientific Panel report contains recommendations relating to the use of variable retention silvicultural systems which describe ensuring permanent retention of dead, dying trees and downed wood to provide for habitat. In Clayoquot Sound, non-recoverable losses are assumed to be a natural and desirable feature of the old-growth forests dominating the area. Silvicultural systems are to be implemented in a way that best mimics the natural disturbance patterns of the area.

Undoubtedly it is appropriate in most timber supply analyses to consider a deduction to account for non-recoverable losses. However, in the case of the current analysis for Clayoquot Sound, it is already assumed in the one-percent-per-year rate of cut that the harvest pattern resulting from following the Scientific Panel's recommendations would contribute to levels of non-recoverable losses which are appropriate to the required management regime. Such losses are not assumed to contribute to the timber supply for the TFL.

Public input from Parks Canada expressed concern about windthrow along the park boundary and requested that an additional buffer zone be provided between the park boundary and harvesting activity. The licensee notes in the management plan that it will manage harvesting activity to minimize windthrow in accordance with the recommendations of the Scientific Panel, and that it will ensure that harvesting activities do not infringe on the park boundary.

I have considered the information presented regarding non-recoverable losses and am satisfied that it has been handled appropriately for the purposes of this determination.

Reasons for decision

In reaching my decision on an AAC for TFL 54, I have considered all the factors presented throughout this rationale and have reasoned as follows.

The primary factor I have considered in making this determination is the fact that 93 percent of the area of TFL 54 lies within the area covered by the provincial government's 1993 CSLUD. In 1995 the provincial government accepted, and committed to full implementation of, the Scientific Panel's recommendations for sustainable forest management in Clayoquot Sound. This was subsequently confirmed in the Minister of Forests' letter of September 17, 1996 to the chief forester, which contained a formal expression of social and economic objectives of the Crown, and confirmed government's intention that timber harvesting would continue to be one of the forest management objectives for the Clayoquot area. I have therefore placed significant weight in my determination on the Crown's stated objective that the Clayoquot area be managed according to the recommendations of the Scientific Panel.

In consequence, the methodology adopted in this determination, as in the previous determination for this TFL, is fundamentally different from that applied in AAC determinations for other management units in the province outside the Clayoquot area. While I have considered in detail all those factors required to be considered under Section 8 of the *Forest Act*, I have not done so by testing the current validity of a computer-generated timber supply projected over a period of hundreds of years, as is the conventional approach to AAC determinations in this province. Rather, I have used a methodology for examining timber supply which is as consistent as possible, given currently available information, with specific recommendations of the Scientific Panel which bear a direct relationship with the amount of timber that may be harvested from watershed areas within Clayoquot Sound.

In employing this methodology, I have attempted to reconcile the provincially legislated requirement to determine an AAC for TFL 54 under Section 8 of the *Forest Act* with government's expressed intention to implement the Scientific Panel's recommendations for the area, given that these include the recommendation to "determine the anticipated annual volumes of timber to be cut for watershed planning units", "*after* analysis of resources and development of area-based plans" (from recommendation R7.10).

This determination is being made *before*, rather than after, completion of local planning for the area, in order to meet the requirements of Section 8. For that reason I have noted

in my considerations that the AAC I determine is intended to provide an indication of the average maximum harvest level that might be attained, in accordance with the chief forester's interpretation, with which I concur, of certain of the Scientific Panel's recommendations. I understand that the actual harvest level achieved in the area will result from due planning processes overseen by the CRB.

As noted previously, the BCFS area-based analysis of the harvestable area in the TFL by watershed was based on an application of the harvesting restrictions prescribed in the Scientific Panel's recommendations. It would have been possible to interpret these restrictions as applying to the gross land area in each watershed, the productive forest in each watershed, or the net operable timber harvesting land base in each watershed. As discussed under Application of the Scientific Panel's recommendations in timber supply analysis, the application of the restrictions to either of the first two of these alternative land bases would have resulted in a harvest level that was higher than the AAC of 138 000 cubic metres in effect prior to the previous determination for TFL 54. The use of either of these two alternative land bases to determine the rate of cut would appear to be counter to the intent of the Scientific Panel. I agree with the conclusions reached by the chief forester in this regard, in particular given that the implementation of the Scientific Panel's recommendations is likely to result in a more constrained timber supply than would be the case if only Forest Practices Code requirements were applied. The application of the Scientific Panel's recommendations to either suggested land base other than the timber harvesting land base would result in an intensity of harvesting activity in Clayoquot Sound higher than historic harvest levels. I am satisfied that the only reasonable assumption to be made is to apply the chief forester's interpretation of the Scientific Panel's recommendations regarding rate-of-cut to the timber harvesting land base, as was done in the BCFS watershed-based analysis.

I have examined the methodology employed in the BCFS area-based analysis as described in 'Timber supply analysis base case projection', and I consider this to be a reasonable means of deriving the annually harvestable area and the average volume per hectare for the purposes of this determination.

From all the considerations and reasoning presented in this rationale, I have identified no reason to vary from the results of the analysis, nor any reason to vary from the current AAC, for this determination. I therefore determine that the existing annual harvest volume of 75 750 cubic metres is a suitable AAC for TFL 54 at this time.

Determination

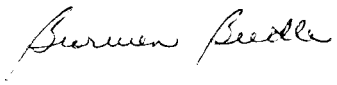
It is my determination that effective January 1, 2000, the new AAC for TFL 54 will be 75 750 cubic metres, unchanged from the current AAC. This AAC will remain in effect until a subsequent AAC is determined, which must take place within five years of this determination.

This AAC should not be construed as an input to local planning processes overseen by the CRB, which are intended to identify the specific areas for harvest on which the actual harvest level achieved will depend.

Implementation

During the term of Management Plan No. 3, the licensee should continue to work closely with South Island Forest District staff and with the CRB to ensure that all timber harvesting in the Clayoquot Sound area is a result of, and conforms to, appropriate local planning and forest practices as recommended by the Scientific Panel.

I strongly encourage BCFS staff, the planning committee and others involved in the planning for Clayoquot Sound to work to complete watershed level plans as soon as feasible so that better information can be incorporated into future determinations.



Bronwen Beedle
Deputy Chief Forester
January 27, 2000

Appendix 1: Section 8 of the Forest Act

Section 8 of the Forest Act, Revised Statutes of British Columbia 1996, reads as follows:

8. Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut 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, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(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.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) 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, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area.

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine a volume of timber to be harvested from each woodlot licence area during each year or other period of the term of the woodlot licence, according to the licence.

(7) The regional manager or the regional manager's designate must determine a volume of timber to be harvested from each community forest agreement area during each year or other period, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must 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) silviculture 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 the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia 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 government, as expressed by the minister, for the area, for the general region and for British Columbia, and

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

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Appendix 2: Section 4 of the Ministry of Forests Act

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

File: 10100-01

JUL 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
Ministry of Forests
OFFICE OF THE MINISTER

MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

Re: The Crown's Economic And Social Objectives Regarding Visual Resources

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

.../2

In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis.*

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests

File: 10100-01

September 17, 1996

Larry Pedersen
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear Larry Pedersen:

Re: Social and economic objectives of the Crown in the Clayoquot Sound area

The government of British Columbia recognizes that the circumstances and history surrounding the development of forest management policy for the Clayoquot Sound area are complex and unique in British Columbia. In particular, government has accepted the recommendations of the report of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound.

Since these circumstances are specific to the Clayoquot Sound area, it is appropriate to express social and economic objectives of the Crown for this area specifically, in addition to the more generally applicable objectives expressed in the letter dated July 28, 1994, and the memo dated February 26, 1996, from the Minister of Forests to the Chief Forester.

In that respect, first, I confirm that it is government's intention that timber harvesting continue to be one of the forest management objectives for the Clayoquot area. Second, it is government's intention that management of the area be carried out in accordance with both the Forest Practices Code and the recommendations of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound.

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V I X4

These intentions should be read as an expression of the socio-economic objectives of the Crown for the Clayoquot Sound area, for consideration in the determination of allowable annual cuts for those management units which include parts of Clayoquot Sound.

Yours truly,

David Zirnhelt
Minister of Forests