BRITISH COLUMBIA
MINISTRY OF FORESTS, MINES AND LANDS

Mid Coast
Timber Supply Area

Rationale for
Allowable Annual Cut (AAC)
Determination

Effective February 17, 2011

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Chief Forester

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Objective of this document

This document provides an accounting of the factors I have considered and the rationale I have employed as chief forester of British Columbia (BC) in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Mid Coast Timber Supply Area (TSA). This document also identifies where new or better information is needed for incorporation in future determinations.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider a number of specified factors in determining AACs for timber supply areas and tree farm licences. Section 8 is reproduced in full as Appendix 1 of this document.

Acknowledgement

I am indebted to staff of the BC Ministry of Natural Resource Operations (MNRO) in the North Island-Central Coast Resource District (the district), the Coast Region, and the Ministry of Forests, Mines and Lands (MFML) (formerly the Ministry of Forests and Range – MFR) Forest Analysis and Inventory Branch (FAIB), for compilation and preparation of the information I have considered in this determination. I am also grateful to the Mid Coast TSA Licensee-Agency Group (licensee group) and to Forsite Consultants Limited (Forsite) for the 2010 timber supply analysis, and to the First Nations, licensees and non-governmental organizations who have contributed information for my consideration through the consultation and public review processes.

Overview of Mid Coast Timber Supply Area

The Mid Coast TSA is situated on the central coast of BC and covers approximately 2.7 million hectares. It is bordered by the Kingcome TSA to the south, by Tweedsmuir Park to the east, and by the Fiordland Recreation Area, the Kitlope Heritage Conservancy Protected Area and Tree Farm Licence (TFL) 25 to the north. The TSA is part of the larger administrative unit known as the North Island-Central Coast Resource District, which is administered from a district office in Port McNeill and a field office in Bella Coola.

The terrain in the Mid Coast TSA is variable and rugged. The outer coast portion of the TSA consists primarily of numerous low-lying islands and the outlying coastal mainland that support forests of relatively low productivity. The inner coast portion, further inland, consists of mountainous terrain, with very productive forests in the valley bottoms and along the many steep sided inlets, and with a large proportion of non-forested (alpine and subalpine) areas and ice fields at higher elevations.

Only a small portion of the total TSA area is forested (38 percent) and an even smaller portion is suitable for timber harvesting (12 percent). The productive forests are typically dominated by hemlock or balsam (65 percent) and western redcedar (25 percent), with minor proportions (about 5 percent each) of Sitka spruce and Douglas-fir. Most harvesting is confined to valley bottoms and valley sidewalls since much of the remaining land is either protected area or too rugged to support marketable timber.

Apportionment of the Mid Coast TSA AAC

The current AAC for the Mid Coast TSA was determined by the chief forester in June 2000 to be 998 000 cubic metres. Since that time, numerous new conservancy areas or biodiversity, mining and tourism areas (BMTAs) have been established in the area. In order to account for the conservancies and BMTAs the Minister of Forests and Range (which is now the Ministry of Forests, Mines and Lands) in accordance with Section 10 of the *Forest Act*, reduced the apportioned AAC for the Mid Coast TSA by 200 982 cubic metres. Therefore, the total current apportioned AAC for the Mid Coast TSA is 797 018 cubic metres, which was apportioned to various forms of agreement as shown in Table 1.

Table 1. Apportionment of 2010 AAC for the Mid Coast TSA

Form of Agreement	Apportioned AAC
Forest Licences, Replaceable	592 933
Non-Replaceable Forest Licence – First Nations	32 679
BCTS Timber Sale Licence/Licence	104 511
Woodlot Licence	3 000
Community Forest Agreement	50 000
Forestry Licence to Cut (Salvage)	5 000
Forest Service Reserve	8 895
Total	797 018

New AAC determination

Effective February 17, 2011, the new AAC for the Mid Coast TSA under Section 8 of the *Forest Act* will be 767 000 cubic metres of which 691 000 cubic metres are harvestable within the watersheds that are outside the Owikeno Lake basin.

This new AAC represents a reduction of 23 percent from the AAC determined June 1, 2000, and is 3.7 percent lower than the total current apportioned AAC for the Mid Coast TSA. This new AAC excludes all volumes in issued community forest agreements and will remain in effect until the next AAC is determined.

Information sources used in the AAC determination

- Mid Coast TSA Economic Operability Assessment, version 1.2, Forsite Consultants Ltd., March 2009;
- Mid Coast TSA TSR3 Analysis and Assumptions Document (Data Package) version 2.3 (revised from version 1.0, March 2009), Forsite Consultants Ltd., May 2010;
- Mid Coast TSA TSR3 Analysis Report version 2.1, Forsite Consultants Ltd., May 2010;
- Mid Coast Timber Supply Review III – First Nation and Public Review and Comment Summary for the Analysis Report, Forsite Consultants Ltd., May 24, 2010;

- Mid Coast TSA Timber Supply Review 3 – Summary of Public and First Nations Information Sharing by TSR Licensee/Agency Group, Forsite Consultants Ltd., June 12, 2009;
- Site Index Adjustment of the Mid Coast TSA (Project # BC0108405), Timberline Natural Resource Consultants Ltd., 2009;
- South Central Coast Order, BC Ministry of Agriculture and Lands, signed July 27, 2007, and effective August 2, 2007;
- Amended South Central Coast Order, BC Ministry of Agriculture and Lands, signed March 23, 2009, and effective March 27, 2009;
- Central and North Coast Land Order, BC Ministry of Agriculture and Lands, signed December 19, 2007, and effective January 3, 2008;
- Amended Central and North Coast Land Order, BC Ministry of Agriculture and Lands, signed March 23, 2009, and effective March 27, 2009;
- Background and Intent Document for the South Central Coast and Central and North Coast Land Use Objectives Orders, Integrated Land Management Bureau, April 18, 2008;
- 2008 – 2010 Coast Timber Supply Areas Regional Forest Health Overview, BC Ministry of Forests and Range;
- Memo: Support of CRLT for the Unused Volume Policy Development. BC Ministry of Forests. 2007;
- DFAM interim standards for data package preparation and timber supply analyses. BC Ministry of Forests, 2003;
- DFAM interim standards for public and First Nations review. BC Ministry of Forests, 2003;
- Procedures for Factoring Visual Resources into Timber Supply Analyses, BC Ministry of Forests, 1998;
- Timber Supply Review, Mid Coast Timber Supply Area Analysis Report, BC Ministry of Forests, 1999;
- Landscape Unit Planning Guidebook, Forest Practices Code, BC Ministry of Forests, 2002;
- Community Watershed Guidebook, Forest Practices Code, BC Ministry of Forests, 1996;
- Coastal Watershed Assessment Procedures Guidebook, Forest Practices Code, BC Ministry of Forests, 1999;
- Riparian Management Area Guidebook, Forest Practices Code, BC Ministry of Forests, 1995;
- Biodiversity Guidebook. Forest Practices Code, BC Ministry of Forests and BC Ministry of Environment, Lands and Parks, 1995;
- Forested Swamps of Central and North Coast BC. Coastal Forest Conservation Initiative, Terry Lewis, 2007;
- Bella Coola Valley Economic Development Operational Plan 2005–2007, Central Coast Economic Development Corporation, 2005;
- Economic Dependency Tables for Forest Districts: 2006 Gary Horne, BC Stats 2009a;
- BC Local Area Economic Dependencies, Gary Horne, BC Stats 2009b;

- BC Central Coast and North Coast Timber Harvesting and Processing Employment Survey, Pierce Lefebvre Consulting Ltd., 2006;
- Analysis of Wood Flow in the Coast Forest Region, Pierce Lefebvre Consulting and DA Ruffle and Associates Ltd., 2003;
- Socio-economic Assessment for the Central Coast Land Use Plan: Government to Government Outcomes, Robinson Consulting and Associates, 2008;
- Mid Coast TSA Rationale for Allowable Annual Cut (AAC) Determination by Chief Forester Larry Pedersen, BC Ministry of Forests, Effective June 1, 2000;
- Kingcome TSA TSR3 Data Package (Project # 4061921), Timberline Natural Resource Consultants Ltd., 2008;
- Kingcome TSA Rationale for AAC Determination by Chief Forester Jim Snetsinger, BC Ministry of Forests and Range, effective February 2, 2010;
- Identified Wildlife Management Strategy, BC Ministry of Environment, 2004;
- Riparian Management Area Guidebook, BC Ministry of Forests, December, 1995;
- Section 7 Notice, BC Ministry of Environment, 2004 and Revised Notice March 2, 2006;
- Estimating the Non-Productive Losses Associated with Roads and Landings in the Mid Coast TSA (FIA project) – Report on preliminary results. International Forest Products Ltd, 2010;
- Implementation Monitoring of Ecosystem Based Management (EBM) in the Central Coast. Coast Forest Conservation Initiative, Symmetree Consultants Ltd., 2007;
- DSP Decision Support Report 24 - Analysis of Revised Strategic Land-Use Objectives. Prepared by Andrew Fall, Gowlland Technologies Ltd. for the Integrated Land Management Bureau, B.C. Ministry of Agriculture and Lands. Nanaimo, B.C. July 2009;
- Letter from the Minister of Forests and Range to the chief forester stating the economic and social objectives of the Crown. July 4, 2006;
- *Forest Act*, 1996 and amendments;
- *Forest and Range Practices Act*, 2002 and amendments;
- Forest and Range Practices Regulations, 2004 and amendments;
- *Ministry of Forests and Range Act* (consolidated to March 30, 2006);
- Input received from First Nations through the information and or consultation process;
- Information received at a meeting held June 22, 2010, between representatives of major licensee International Forest Products Ltd., (Interfor), me, as chief forester, MFR (now MNRO) employees from North Island-Central Coast Resource District and Forest Analysis and Inventory Branch; and
- Technical review and evaluation of current and expected operating conditions through comprehensive discussions with government staff including the AAC determination meeting held in Port McNeill on June 23 and June 24, 2010.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester, in determining AACs, to consider biophysical, social and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs of inventory and growth and yield data. These are concerned primarily with biophysical factors—such as the rate of timber growth and the definition of the land base considered available for timber harvesting—and with management practices.

The analytical techniques used to assess timber supply necessarily are simplifications of the real world. Many of the factors used as inputs to timber supply analysis are uncertain, due in part to variation in physical, biological and social conditions. Ongoing scientific studies of ecological dynamics will help reduce some of this uncertainty.

Furthermore, computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Technical information and analysis; therefore, do not necessarily provide the complete answers or solutions to forest management decisions such as AAC determinations. Such information does 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 determining this AAC for the Mid Coast TSA I have considered known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

Guiding principles for AAC determinations

Rapid changes in social values and in the understanding and management of complex forest ecosystems mean there is always uncertainty in the information used in AAC determinations. In making the large number of periodic determinations required for BC's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainties. To make my approach in these matters explicit, I have set out the following body of guiding principles. In any specific circumstance where I may consider it necessary to deviate from these principles, I will explain my reasoning in detail.

Two important ways of dealing with uncertainty are:

- minimizing risk, in respect of which in making AAC determinations I consider particular uncertainties associated with the information before me and attempt to assess and address the various potential current and future, social, economic and environmental risks associated with a range of possible AACs; and
- re-determining AACs frequently, in cases where projections of short-term timber supply are not stable, to ensure they incorporate current information and knowledge.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I intend to reflect, as closely as possible, those forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect to factors that could affect the timber supply that are not substantiated by demonstrated performance or are beyond current legal requirements.

In many areas, the timber supply implications of some legislative provisions remain uncertain, particularly when considered in combination with other factors. In each AAC determination I take this uncertainty into account to the extent possible in context of the best available information.

It is my practice not to speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government. However, where specific protected areas, conservancies, or similar areas have been designated by legislation or by order in council, these areas are deducted from the timber harvesting land base (THLB) and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting resource management objectives such as for biodiversity.

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to fully analyse and account for the consequent timber supply impacts in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring for instance further detailed planning or legal designations such as those provided for under the *Land Act* and the *Forest and Range Practices Act* (FRPA). In cases where there is a clear intent by government to implement these decisions that have not yet been finalized, I will consider information that is relevant to the decision in a manner that is appropriate to the circumstance. The requirement for regular AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

Where appropriate I will consider information on the types and extent of planned and implemented silviculture practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of their timber supply effects.

Some persons 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 incomplete, but this will always be true where information is constantly evolving and management issues are changing. The requirement for regular AAC reviews will ensure that future determinations incorporate improved information.

Others have suggested that, in view of data uncertainties, I should immediately reduce some AACs in the interest of caution. However, any AAC determination I make must be the result of applying my judgement 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' involvement, I am aware of the Crown's legal obligation resulting from recent court decisions to consult with First Nations regarding asserted rights and title (aboriginal interests) in a manner proportional to the strength of their aboriginal interests and the degree to which the decision may impact these interests. In this regard, I will consider the information provided to First Nations to explain the timber supply review (TSR) process and any information brought forward respecting First Nations' aboriginal interests including how these interests may be impacted, and any operational plans and actions that describe forest practices to address First Nations' interests, before I make my decision. As I am able, within the scope of my authority under Section 8 of the *Forest Act*, where appropriate I will seek to address

aboriginal interests that will be impacted by my proposed decision. When aboriginal interests are raised that are outside my jurisdiction, I will endeavour to forward these interests for consideration by appropriate decision makers. Specific concerns identified by First Nations in relation to their aboriginal interests within the TSA are addressed in various sections of this rationale.

The AAC that I determine should not be construed as limiting the Crown's obligations under court decisions in any way, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within the Mid Coast TSA. It is also independent of any decisions by the Minister Forests, Mines and Lands with respect to subsequent allocation of wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of BC, of the mandate of the Ministry Forests, Mines and Lands (formerly the Ministry of Forests and Range) as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest and Range Practices Act (FRPA).*

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the TSR program for TSAs and Tree Farm Licences (TFLs).

For most AAC determinations, a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer simulation model, a series of timber supply forecasts can be produced, reflecting different starting harvest levels, rates of decline or increase, and potential trade-offs between short- and long-term harvest levels.

From a range of possible forecasts, one is chosen in which an attempt is made to avoid both excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forestlands. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply. The base case is designed to reflect current management practices.

Because the base case represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TSA is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it.

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

Such adjustments are made on the basis of informed judgement using current, available information about forest management that may well have changed since the original information package was assembled. Forest management data are particularly subject to revision during periods of legislative or regulatory change, or during the implementation of new policies,

procedures, guidelines or plans. Thus it is important to remember that while the timber supply analysis with which I am provided is integral to the considerations leading to the AAC determination, the AAC is not determined by calculation but by a synthesis of judgement and analysis in which numerous risks and uncertainties must be weighed. Depending upon the outcome of these considerations, the resulting AAC may or may not coincide with the base case forecast. Moreover, because some of the risks and uncertainties considered are qualitative in nature, once an AAC has been determined, further computer analysis of the combined considerations may not confirm or add precision to the AAC.

Base case for the Mid Coast TSA

The timber supply analysis used as a base of reference for my considerations in this AAC determination was performed by Forsite Consultants Ltd. (Forsite), on behalf of the Mid Coast TSA Licensee/Agency Group (licensee group), using the Patchworks ^{TM} spatial forest estate model. The analysis was finalized on May 10, 2010. Forsite also completed a prior data package dated March 10, 2009, and a revised data package dated May 10, 2010.

The base case forecast assumed management practices consistent with FRPA and the Coast Land Use Decision (CLUD). The CLUD established new conservancies and BMTAs, and implemented the South Central Coast and Central and North Coast Ministerial Orders which set out objectives for ecosystem-based management (EBM).

Harvest flow objectives for the timber supply analysis included achieving a stable long-term harvest level (LTHL) over a 300-year period reflecting the productive capacity of the TSA under current forest management practices; achieving an acceptable short-term harvest level consistent with this LTHL; constraining harvest level reductions to 10-percent-or-less per decade; and maintaining the mid-term harvest level at or above a level reflecting the natural productive capacity of the TSA. To be consistent with expected future harvest performance in the TSA, the base case harvest profile was also configured to meet the following conditions in each 10-year period. The harvest from stands in the outer coast was not to exceed 20 percent of the TSA total and the harvest volume from old-growth hemlock and balsam-leading stands of low and poor site productivity (where the site index was below 17 metres) was not to exceed 19 percent of the TSA total.

In the base case forecast, under the above stated objectives, accounting for EBM and for lands removed for the establishment of conservancies, BMTAs and probationary community forest agreements, the initial harvest level was projected at 767 000 cubic metres per year. This level is 23 percent below the current AAC of 998 000 cubic metres and slightly below the Section 173, Part 13 of the *Forest Act* reduced AAC that was in effect for the period between September 28, 2006, and May 23, 2010. After the first decade, the harvest rate in the base case decreased by 10 percent to 687 000 cubic metres, for seven decades, and then increased to a long-term harvest level of 764 000 cubic metres. A critical period in the forecast occurred between the sixth and eighth decades when the harvest transitions from natural stands to managed stands. This period was probably the most complex in terms of achieving the timber supply requirements because natural stands suitable for harvest were starting to be scarce and managed stands were just achieving merchantable age. Sensitivity analysis showed that alternative assumptions that reduced or delayed the merchantability of managed stands in this period affected the initial harvest level since existing natural stands had to be harvested at slower rates.

All of the projected harvest levels were reduced by 14 071 cubic metres per year to account for non-recoverable losses and 1500 cubic metres per year to account for timber harvested by First Nations for social, or ceremonial purposes under Free Use Permits. The analysis model accounted for estimated disturbances outside the timber harvesting land base.

I have reviewed the assumptions and methodology incorporated in the base case projection and related sensitivity analyses. As part of this review, I have examined projections over the forecast period for the growing stock of timber in the TSA, including the dominant tree species, their age and the average age at which they were harvested, as well as their contributions to the volumes of timber projected to be harvested over time. Details of my considerations of particular aspects of the analysis and its projections, in some cases in relation to uncertainties in associated assumptions, are provided in following sections of this document.

From my review of the timber supply analysis, including discussions with the MFML analyst who reviewed and accepted the analysis, I find that the base case forecast provides a reliably informative basis of reference for my considerations in this determination. In addition to the base case, I have reviewed sensitivity and alternative forecasts which have also been helpful in my considerations as documented in the following sections and in the reasoning leading to my determination.

Consideration of Factors as Required by Section 8 of the *Forest Act*

I have reviewed the information for all of the factors required under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case appropriately represents current management or the best available information and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 2 (see below).

For other factors, where more uncertainty exists, or where public or First Nations' input indicates contention regarding the information used, modelling, or some other aspect under consideration, this rationale incorporates an explanation of how I considered the essential issues raised and the reasoning leading to my conclusions.

Table 2. List of factors for which modelling assumptions in the base case have been accepted

***Forest Act* section and description**	**Factors accepted as modelled**
8(8)(a) (i) Composition of the forest and its expected rate of growth	• unmerchantable forest types • low productivity sites • environmentally sensitive areas (ESAs) • timber licence reversions • aggregation procedures • age class structure and species profile • minimum harvestable ages
8(8)(a)(ii) Expected time for the forest to be re-established following denudation	• regeneration delay • not satisfactorily restocked areas
8(8)(a)(iii) Silvicultural treatments to be applied	• incremental silviculture

8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	• utilization standards • decay, waste and breakage
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for other purposes	• green-up and adjacency • visually sensitive area • community watersheds • riparian management • EBM objectives for important fisheries watersheds • EBM objectives for active fluvial units • EBM objectives for aquatic habitat that is not high value fish habitat
8(8)(b) the short and long term implications to BC of alternative rates of timber harvesting from the area	• alternative harvest flows
8(8)(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for BC	• Minister's letter
8(8)(e) Abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	• forest health • unsalvaged losses

Section 8 (8)

In determining an allowable annual cut under this section 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 the timber harvest

- general comments

The area of the Mid Coast TSA estimated from inventory data and reported in the 2010 timber supply analysis was 2.7 million hectares, of which 1.025 million hectares were productive forest. The timber harvesting land base is the area of productive forest within the Mid Coast TSA that is assumed to be available and suitable for timber harvesting. The THLB derived for the base case forecast was 123 162 hectares at beginning of the forecast. Following deductions for future roads, trails and landings and the addition of areas currently within timber licences that will revert to the TSA, the long-term THLB was 125 728 hectares.

The size of the THLB was determined in the timber supply analysis through a series of land base reductions that were applied to the productive forest area in order to account for the many factors

that, for economic or ecological reasons, effectively reduce the extent of the productive forest area that is suitable and available for timber harvesting. In making these deductions, assumptions or projections were made about many factors. My considerations of the reasonableness of particular deductions are documented in the following sections.

- *recreation features*

The Recreation Features Inventory (RFI) was developed to help land managers to properly protect and manage recreation values on the forest landscape. The RFI for the Mid Coast TSA, which was updated in 2006, was used in the analysis to identify areas that provide significant recreation opportunities, such as wildlife viewing, camping and sheltered moorages, or because they were sensitive to alteration.

Following consultation with the MFML and the Ministry of Tourism, Trade and Investment (MTTI), the licensee group selected a subset of recreation features that were classified as very-highly significant, highly significant or moderately significant with high sensitivity, and excluded these areas from THLB. Since the licensee group's operational experience in the TSA was that most recreational values are accommodated through management without establishing reserve areas, the subset was further reduced to features located outside of areas with visual quality objectives and only half of the area within the subset was excluded from the THLB. As a result 3466 hectares, or 0.3 percent of the productive forest, was excluded for protection of recreation features. This exclusion did not include the forest recreation sites and trails that were established in November 1999 and represent less than 10 hectares of THLB.

Recreation features in the Mid Coast TSA have not been formally protected through an Order under the Government Actions Regulation (GAR) of the FRPA. Therefore, the conservation of significant and sensitive recreation values in the TSA currently relies on the judgement of forestry professionals managing the area.

In their letter on May 18, 2010, Interfor submitted that the THLB land exclusion applied for recreation features was too great and was a "consequence of making the same mistake that was made in TSR 2". They also indicated that past harvesting had created the possibility for recreation opportunities, such as bear viewing, and that the recreation and timber harvesting are not mutually exclusive uses.

Staff from MTTI confirmed that some second-growth area, such as in the Nekite Valley, received high-significance rating because past harvesting and improved access has created conditions that are highly suited for grizzly bear viewing. MTTI staff also advised me that the current analysis relied on a new RFI that was not applied in the previous timber supply review. Furthermore, I note that the methodology applied to account for significant recreation features in the timber supply analysis was similar to those applied in the analysis for other nearby management units.

Based on the information provided in the analysis and advice from MTTI and MNRO staff, I conclude that assumptions applied in the base case forecast reasonably reflect current management in the Mid Coast TSA.

- *Coast Land Use Decision and designated areas*

The BC provincial government announced the Coast Land Use Decision (CLUD) on February 7, 2006. The decision included objectives for ecosystem-based management (EBM) and the

creation of three land use zones: conservancies; biodiversity, mining and tourism areas (BMTAs) (which contribute to the conservation of species, ecosystems and seral stage diversity and in which commercial timber harvesting and commercial hydro-electric power projects are prohibited); and EBM operating areas.

In April 2006, the provincial *Park Act* was amended to create the new conservancy designation for the Protected Areas zone. In conservancies, logging, mining, and hydro-electric generation are prohibited (except for run-of-the-river hydro projects) but, in distinction from Class 'A' Parks, social, ceremonial and cultural uses by First Nations are permitted, as are low-impact economic opportunities such as tourism operations.

To protect the conservancies and the BMTAs in the period before they were formally established, government established the Coast Designated Area No.2, and, on September 28, 2006, I issued an order under Part 13, Section 173 of the *Forest Act* that temporarily reduced the AAC for the Mid Coast TSA by 230 000 cubic metres. This reduction remained in effect until May 2010 when the Part 13 designation expired. However, through Bill 28 – 2006 *Park (Conservancy Enabling) Amendment Act*, Bill 24 -2007 *Parks And Protected Areas Statutes Amendment Act*, and Bill 38 – 2008 *Protected Areas of British Columbia (Conservancies And Parks) Amendment Act, 2008*, the 37 conservancies within the Mid Coast TSA were formally deleted from the TSA. Additionally, in January, 2009, the nine BMTAs within the TSA were designated by an order in council pursuant to the *Environment and Land Use Act.* As a result, on May 3, 2010, the Minister of Forests and Range (which is now the Ministry of Forests, Mines and Lands) revised the apportionment for the Mid Coast TSA in response to my opinion that the conservancies and BMTAs reduced the AAC of the Mid Coast TSA by 200 982 cubic metres.

From my review of the history of the designation of these areas and of their representation in the timber supply analysis, I am satisfied that the base case projection adequately accounts for the removal of these areas from the TSA.

- *economic operability*

In 2009, an economic operability assessment (EOA) was completed by Forsite (2009) on behalf of the licensee group. This involved assessing the net financial value (i.e., timber value minus delivered wood cost) for each available stand in the TSA and then undertaking a modelling exercise to determine largest land base that could achieve a specified economic return under a set of road development costs and limits. The economic return target was based on the historical average stumpage paid by major licensees in the TSA between 1998 and 2007 which, after adjustment for the EBM cost allowance, was 6.33 dollars per cubic metre. The operability of previously harvested stands was also assessed in the project since they were not automatically assumed operable within the time frame of the forecast.

The assessment only considered stands that had a site index of at least 10 metres, were capable of generating 350 cubic metres per hectare within 200 years (or 300 cubic metres per hectare for western redcedar or cypress leading stands) and were outside of spatially defined reserves (e.g., wildlife habitat areas). The timber value for each stand was based on forest inventory information, grade distribution, and average log-selling price. Selling prices were the 10-year average (1998-2008) prices from the Vancouver Log Market for each species and grade combination in the TSA. The delivered wood costs were associated with harvesting and delivering a cubic metre of wood to the Vancouver Log Market excluding road construction.

Cost estimates were drawn from various sources such as annual surveys and were adjusted by the licensee group to reflect local conditions. Road development was modelled by identifying the full extent of existing and future roads using maps of existing roads and future road networks. Construction costs were assigned to future roads based on slope class and road type and, where major bridges or higher than average road reactivation requirements were known, short segments of the road were assigned additional construction costs.

The result of the modelling showed that an economically operable land base of 175 181 hectares could achieve the net revenue target for the TSA in each five-year period of a 200 year projection. This operable land base included a wide range of stand values because positive value stands were allowed to offset negative value stands as long as the net return objective was met in each period. Overall, 69 percent of the final operable land base consisted of positive return stands.

In addition to the base case target, two alternative economic return targets were assessed by varying the base target by five dollars (i.e., to 11.33 dollars per cubic metre and 1.33 dollars per cubic metre). The operable land base using these targets was used to formulate a sensitivity forecast. Increasing the economic return target by five dollars reduced the THLB by 14.3 percent and produced a forecast with an initial harvest level that was 15 percent lower than the base case and a long-term harvest level that was 13 percent lower than the base case. Decreasing the economic return target by five dollars increased the THLB by 14.9 percent and produced a forecast with an initial harvest level that was 12 percent greater than the base case and a long-term harvest level that was 14 percent greater than the base case.

The Mid Coast TSA economic operability report and maps were reviewed by forest professionals employed by MNRO who were familiar with operating conditions in the TSA. These reviewers identified several watersheds within the operable land base located in the eastern portion of the Owikeno Lake basin, including the drainages of the Sheemahant, Machmell and Neechanz rivers, where current conditions pose a significant challenge to timber harvesting activity. The reviewers reported that existing roads in some of these watersheds have deteriorated in the absence of active operations, have been deactivated with bridges removed or, in the case of a road in the Machmell River watershed, have washed-out. Their conclusion was that significant road development costs will be incurred in order to harvest the old-growth timber in these drainages and that there is a reasonable likelihood that further harvesting would not happen until second-growth timber in the area reaches a merchantable age. Since forest cover information indicates that the oldest second-growth timber in these areas is between 30 and 35 years old, the MNRO reviewers recommended that a sensitivity analysis explore the impact of deferring harvesting in these areas for four decades, allowing them to contribute to the forecasted harvest starting in the fifth decade. In addition, the reviewers identified a few watersheds where they believed there was a risk that harvesting would not be conducted in the foreseeable future and recommended that the analysis explore the consequence of indefinitely deferring harvest in those areas. The watersheds recommended for short-term deferral contained nine percent of the THLB and contributed approximately 10 percent of the volume available in the short-term base case forecast. The watersheds recommended for indefinite deferral contained one percent of the THLB and contributed approximately two percent of the volume available in the short-term base case forecast.

The sensitivity forecast that delayed harvesting for four decades in the short-term deferral watersheds and excluded harvesting in the indefinite deferral watersheds had a harvest level that

was four percent lower than the base case in the short term and 10 percent lower than the base case in the mid-term period.

Kvamua Enterprises Limited Partnership stated in a letter dated April 22, 2010, that the concerns expressed by MNRO reviewers about short- and mid-term harvesting in the Machmell and Sheemahant valleys were understandable. However, Kvamua Enterprises did not support analysis assumptions that deferred harvesting in the selected areas for 40 years and excluded harvesting in other areas, since doing so would have a significant negative impact on ongoing treaty negotiations and future economic opportunities within the Wuikinuxv Nation's traditional territory. As an alternative, Kvamua Enterprises supported the creation of an AAC partition for the Owikeno Lake basin, similar to what was previously specified for the outer coast.

International Forest Products (Interfor) at a meeting on June 22, 2010, and in letters dated May 18, 2010, and June 25, 2010, provided comments with regards to operability in the Owikeno Lake basin and the concerns raised by MNRO reviewers. They raised a number of points which supported the reasonableness of the base case operability assumptions in Owikeno Lake basin. In summary, these points are as follows:

- The Owikeno Lake basin includes harvestable stands distributed throughout the drainage. The areas identified by the MNRO reviewers were isolated in the economic operability modelling and the development costs were set higher than the average to address concerns about operability.
- Interfor's investigation suggested that the road infrastructure is not in ruins and the infrastructure observed in several aerial photographs appeared to be in good condition.
- The issue of deteriorating infrastructure is not unique to the Owikeno Lake basin and since the primary access has been established much of the development costs have already occurred.
- The road construction costs in the Owikeno Lake basin should be viewed as below average for the TSA due to the availability of gravel ballast – in contrast to shot-rock which is used in other drainages.
- The key issue in the basin is the business uncertainty occurring as a result of the local situation.

Interfor recommended that I accept the base case assumptions for the Owikeno Lake basin and retain its contribution to the AAC.

Western Forest Products (WFP) in their submission dated June 4, 2010, indicated that they believe the EOA provided an improved base from which to evaluate economic operability. They commented that, in their experience in the TSA, the variability in forest cover, log quality and access cost is significant in some areas and that this variability can be both positive and negative to timber supply. However, the company's overall experience in the Mid Coast TSA, which is skewed to the north half of the TSA, is that the overall variability has been more negative than positive relative to expectations. As a result WFP expects that there would be an on the ground reduction in economic operability compared to the model results. WFP agreed in general with the concerns about the economic viability of some areas in the Owikeno Lake watershed. They stated that recent harvest history in some of the main watershed basins combined with EBM constraints and the need to redevelop roads are factors that are likely to limit harvest activity in these areas for the next few decades. In addition, the small volumes at the upper reaches of the

valleys in the Owikeno Lake basin are of low quality, expensive to access and hence marginal at best.

BC Timber Sales, in their letter dated June 10, 2010, stated that the assumptions regarding the short-term contribution of stands within the Owikeno Lake basin used in the base case forecast and sensitivity forecasts are optimistic. In their view, it would be unreasonable to justify the unrestricted inclusion of the THLB in the Owikeno Lake basin simply based on recent operations in the area which have focused on higher-value stands and exclusively logged using heli-water drop operations. Similar opportunities may not be available to other tenure holders in the short term and on a larger scale. However, BCTS indicated that the Owikeno Lake basin provides considerable future potential and that it is in the collective interest of all license holders and BCTS that the existing infrastructure is retained to ensure the land base continues to contribute to the mid- and long-term timber supply. BCTS recommended the establishment of a geographically-based AAC partition on the entire Owikeno Lake basin area. I note that the BCTS recommendation is for the entire lake basin which includes the area considered in the sensitivity forecast plus watersheds in the western part of the basin not considered in the sensitivity forecast. The MFML analyst has indicated that this larger area comprises approximately 17 600 hectares of THLB, which is approximately 14 percent of the TSA total.

Information presented to me by district staff confirms that all recent harvesting in the eastern Owikeno Lake basin has been with helicopters and located in areas close to the lake. The most recent harvesting within the road-accessed areas occurred in 2006 and was a small area. The information also indicated that harvesting has occurred in only a small portion of the areas identified for indefinite deferral and that it occurred before 2005.

I believe the concerns raised by MNRO staff regarding the significant cost that will be incurred to improve roads and bridges in the drainages are justified, which was also acknowledged in the submissions from by Kvamua Enterprises, BCTS and WFP. I also take caution from the submissions by the WFP and BCTS which indicated the remaining old-growth hemlock and balsam volume in the upper reaches of the drainages may be of lower grade than the average profile in the TSA. I am aware that a significant portion of the Owikeno Lake basin is not within an administrative chart and I was told by the district operations manager at the June 23, 2010, AAC determination meeting that recent efforts to persuade licensees to take up charts in the area have not been successful up to that point in time.

In weighing the above, I conclude that the timber supply available within the Owikeno Lake basin is adequately described in the base case if an adjustment is made to exclude the areas recommended by MNRO reviewers for indefinite deferral. Since these areas comprise approximately one percent of the total THLB, I have accounted for a one percent overestimation in the base case initial harvest level, which is equivalent to about 8000 cubic metres per year, as discussed in '**Reasons for Decision**'.

Furthermore, given the legitimate concern about the high operating costs, poor road conditions and low timber quality in parts of the basin and the limited amount of road-based harvesting that has occurred over the last five years, there is uncertainty whether harvesting in the basin will achieve the levels indicated by the base case in the short term. Although I do not agree that a four-decade deferral, as applied in the sensitivity analysis, is a reasonable assumption for the area, I am mindful that if the full AAC is harvested without adequate contribution from the Owikeno Lake basin the sustainability of the mid-term timber supply for the AAC may be at

risk. For this reason, I will specify an AAC partition attributable to the geographic area that is not within the Owikeno Lake basin. In setting the amount for this partition I am guided by two parameters. The first is the percentage of THLB that falls within the entire Owikeno Lake basin (including watersheds in the western basin) which the MFML analyst informed me is approximately 14 percent of the total THLB in the TSA. The second parameter is the short-term impact of the sensitivity forecast that deferred harvesting in selected drainages of the basin for the first four-decades of the forecast, which was four percent. Using this impact, I estimate that a similar deferral applied to the entire Owikeno Lake basin, which includes the western basin, would reduce the initial harvest level in the base case by roughly six percent. Of these two levels, 14 percent and 6 percent, I believe the first may not provide sufficient flexibility for licensees to balance harvesting across the TSA. The second level may not be high enough to ensure that the mid-term harvest level does not decline below the level projected in the base case forecast if insufficient harvesting occurs in the Owikeno Lake basin. Therefore, for the purposes of an AAC partition, I will attribute 10 percent of the new AAC for the Mid Coast TSA to the geographic area within the Owikeno Lake basin, including the western basin, and 90 percent of the AAC to the geographic area outside of the Owikeno Lake basin, as noted in '**Reasons for Decision**' previously harvested stands.

As stated in my earlier description the operability of previously harvested stands was assessed using the EOA – they were not automatically assumed to be operable within the timeframe of the forecast. As a result, an area of 10 499 hectares of previously harvested stands were classed as inoperable. After accounting for overlap with areas previously excluded for other factors, this area was reduced to a net area of 7120 hectares. Most of these stands were apparently excluded because of low net value and inventory attributes indicated that 1389 hectares were deciduous-leading, 687 hectares were associated with significant recreation values and 137 hectares had a site index of less than 10 metres. About 87 percent of the stands were hemlock or balsam leading, 10 percent were western redcedar leading and three percent were Douglas-fir leading and more than 65 percent were naturally regenerated. District staff concluded that most of the 7120 hectares were correctly classified as inoperable.

In addition to the base case, a sensitivity forecast was developed to test the impact of assuming all previously harvested stands were operable. This resulted in a 5.6 percent increase in the THLB, a 4.4 percent increase in the initial harvest level and a 5.1 percent increase in the mid-term harvest level.

Interfor, in its submission of May 18, 2010, indicated that the company "spoke out against the decision to exclude a gross area of 10 499 hectares of previously logged area on the basis of economic operability model results". Their view was that previously harvested areas do not need to be modelled; their contribution has been empirically verified and that the same applies to areas previously excluded from the contributing land base on the basis of ESA mapping. Interfor stated that empirical harvest performance should supersede all other modelled estimates and office based mapping exercises. Interfor provided me with maps of various areas within the TSA on which forest stands were grouped by age and operability class and overlain with cutblock boundaries. On these maps I observed examples of second-growth stands that had been classed as inoperable, some of which fell within mapped cutblock boundaries and others that did not. Furthermore, in addition to the 10 499 hectares referenced above, Interfor indicated during a meeting held June 22, 2010, that inoperable second growth not delineated by cutblock boundaries should also not have been excluded.

Although the submission by WFP on June 4, 2010, did not directly address the exclusion of previously harvested areas, it did provide insight about how harvest block design and targeting of higher value areas within these broad types can impact the operability of remaining areas. WFP wrote "We do know that the harvest strategy can impact operability of nearby remaining timber. In some areas, helicopter logging close to water may be the only economic choice in less than strong markets but this can significantly reduce the operability of adjacent volumes that are needed to pay for roads to access timber further inland that is beyond the economic reach of helicopters."

Regarding previously harvested stands, I am inclined to agree with Interfor that the current assessment of their future economic viability is highly uncertain. Some of these stands will very likely be harvested again within the modelling time period, while others, due to low value or high access costs, may not. In my review of the information prepared by Interfor and the MNRO, I saw examples of stands that appeared to fall within either category and I have not been compelled to consider this group of stands as either entirely operable or entirely inoperable. Lacking information that would enable me to make a more precise adjustment, I estimate that about 50 percent of previously harvested stands that were excluded as inoperable will contribute to future timber supply in the TSA. Given the sensitivity analysis that indicates that assuming all previously harvested stands are operable results in a 4.4 percent increase in the initial harvest level over the base case level, I am accounting for a 2.2 percent or about 17 000 cubic metres per year underestimation in the base case initial harvest level, as discussed in '**Reasons for Decision**'**.**

- *existing and future roads*

In the base case forecast, 3521 hectares were excluded from the THLB as unclassified roads, trails and landings. These area removals were derived by applying road-width buffers to all existing and planned roads that were indicated by linear features on a consolidated roads map. The buffer widths were 15 metres for mainline roads and 11 metres for spur roads, which were selected by the licensee group to capture the area of road, as well as associated landings, pullouts, and unmapped trails.

In addition to area exclusions for mapped roads, a seven percent reduction was applied to the volume estimates of future stands in conventional logging areas that were more than 250 metres from a mapped road. The reduction factor was chosen by the licensee group to be consistent with the permanent access structure limit set out in the Forest Planning and Practices Regulation (FPPR) and commitments made in Forest Stewardship Plans (FSP). The total reduction for future roads was equivalent to an area of 2713 hectares.

In summary, the total reduction applied for roads, trails and landings in the base case was equivalent to 6234 hectares, or five percent of the total THLB. In comparison, the reductions applied in the previous timber supply review for existing and future roads were seven percent and 7.6 percent, respectively. District staff consider the base case assumptions for roads, trails and landings to be more accurate than those applied in the previous timber supply review and to reasonably reflect current practice.

In a letter dated May 18, 2010, Interfor expressed concern that the land exclusions assumed for roads, trails and landings were overestimated and that the area removal was incorrect since roads do not remain unproductive in perpetuity. The company stated that over time a significant

portion of roads become completely overgrown and by rotation age, roads frequently support some of the largest crop trees. Preliminary results of a project undertaken by Interfor in 2010 to examine roads, trails and landings within four landscape unit in their Mid Coast TSA operating area indicated that the average width of mainline, branch and spur roads, measured from orthophoto imagery, in the sampled areas were 5.8 metres, 6.3 metres and 5.8 metres, respectively, and that 72 percent of road area was likely to support crop trees at rotation age. The company recommended that I consider these results as indications that the base case forecast underestimated the TSA timber supply in the mid- and long-term. I note that the Phase I results of the Interfor road-width project do not include information on species composition or productivity of trees growing on roads and have not undergone field verification, which is planned for Phase II. I also note that the sample measurements were limited to four landscape units and were mostly within Interfor's administrative chart areas located in the south-west portion of the TSA.

Based on my review of the above information, I conclude that it is likely that in-growth will occur to some degree on some roads constructed by some licensees. However, it will not happen on maintained mainline roads, nor will it likely happen in a consistent and predictable degree on spur roads. Furthermore, it is uncertain to what degree the trees growing along retired roadways will contribute to the merchantable volume harvested under permit during future road reconstruction. The result of this uncertainty is such that there is insufficient information from which a reliable adjustment could be made to the projected timber supply for the whole TSA. I am therefore satisfied for the purposes of this determination that the base case has reasonably and adequately accounted for the land base reduction for roads, trails and landings. I am encouraged that the road-width assessment project will increase the certainty of modelling assumptions for the next determination. In preparation for the next AAC determination, I encourage licensees to work collaboratively with the district to implement a ground sampling plan that will provide statistically reliable estimates, applicable to the entire TSA, of road-widths and timber volumes on retired roads and of the proportion of roads that remain active after harvesting.

- *community forests*

Two Probationary Community Forest Agreements (PCFA) located in the vicinity of the Bella Coola Valley and nearby inlets, have been established in the Mid Coast TSA since the previous AAC determination. The Nuxalk Nation Community Forest, established in 2006, has an AAC of 20 000 cubic metres. The Bella Coola Resource Society Community Forest, established in 2007, has an AAC of 30 000 cubic metres. Lands within the two PCFAs were excluded from the base case forecast.

Interfor submitted in October, 2009, that because the community forests agreements are probationary, they should not be removed from the TSA in the timber supply analysis. The company also maintains that the area associated with the PCFAs may be excessive and therefore, has an inordinately large impact on the sustainable harvest level for the remainder of the Mid Coast TSA. For these reasons, Interfor requested that the timber supply analysis also include a forecast to examine the timber supply within the PCFAs. MFML and MNRO staff did not support this proposal since the PCFAs were distinct management units each of which has an AAC independent from the TSA. Interfor then commissioned Forsite to develop a timber supply forecast for the TSA that included stands within the two PCFAs. That forecast, which was

described to me in a letter from Interfor dated June 25, 2010, had an initial harvest level that was 67 000 cubic metres per year higher than the base case. I noted that Interfor's PCFA forecast applied EBM constraints as well as the revised operability assumptions, low site operability thresholds and site index adjustments for managed stands that were applied in the 2010 timber supply analysis report for the Mid Coast TSA.

I am mindful that the granting of the PCFA licences were decisions made by another statutory decision maker independent from my AAC determination for the Mid Coast TSA. The scope of my determination under Section 8(1)(a) of the *Forest Act* is the Crown land in the TSA excluding tree farm licence areas, community forest agreement areas and woodlot licence areas. For this reason I conclude that the base case forecast properly excluded the area within the PCFA.

Existing forest inventory

- *current inventory*

The inventory used as a basis for the timber supply analysis for the Mid Coast TSA was originally prepared in 1990 from 1979 photography and was in a Vegetation Resources Inventory (VRI) Forest Inventory Planning (FIP) Rollover format. Forest attributes were projected to January 1, 2008 using Variable Density Yield Prediction model version 6 (VDYP6) and disturbances from harvesting and fire were updated to March 2008 using data compiled from the Reporting Silviculture Updates and Land Status Tracking System (RESULTS) and MFML fire history information.

Although a formal inventory audit published in 1995 indicated that the forest cover inventory for the TSA was reliable for strategic planning purposes district staff reported in the last TSR that inventory volumes on the outer coast appeared to be underestimated, primarily for western redcedar and cypress. They also reported that volume estimates for inner coast stands may be overestimated due to the poor quality of the older hemlock-balsam stands. I have discussed these volume estimates further under *volume estimates for existing natural stands.*

In conclusion, I am satisfied that the existing inventory on which the timber supply analysis was based represents the best available information and is adequate for use in this determination.

I am encouraged to know that an all new VRI for the Mid Coast TSA is being prepared using aerial photography acquired in 2006 and 2007, and will be ready before the next AAC determination.

- *volume estimates for existing natural stands*

The VDYP6 model, developed by MFML, was used to generate a table of timber volumes for each natural stand in the TSA inventory. These tables were then aggregated into a single table for each analysis unit using area-weighted averages. As a check on the aggregation procedures, the sum of all yield curve derived volumes were compared to the sum of inventory volumes. The values agreed to within one percent overall, which is within the range accepted by the MFML.

The sensitivity of the base case to error in existing stand volume estimates was tested by generating forecasts where the volume estimates were increased or decreased by 10 percent. When natural stand yields were increased by 10 percent, the mid-term harvest level was seven percent greater than the base case. I note that an alternative flow for this sensitivity

analysis may have allowed an increase in initial harvest level and a smaller increase in the mid-term level. When natural stand yields were decreased by 10 percent, the initial harvest level was two percent lower and the mid-term harvest level was seven percent lower.

Since the release of the data package, MFML has adopted VDYP7 as the standard method for estimating timber volume in natural stands. To explore how the use of VDYP7 would have changed the analysis results, volume estimates used in the base case were compared to volume estimates compiled with VDYP7. This comparison indicated that VDYP7-based volumes were 5.5 percent higher than the volumes used in the base case. Although a sensitivity forecast was not generated, the analysis report author indicated that, if the additional volume was applied over the mid-term period, the mid-term harvest level in the base case could be increased by about 24 500 cubic metres per year (or alternatively the additional volume could be used to increase the short-term harvest level). This estimate was based on the sensitivity forecast that explored the affects of increasing existing stand volumes by 10 percent, previously described.

The submission from Interfor on May 18, 2010, included comments regarding the potential effect of applying VDYP7 in the base case forecast. Citing the results of the VDYP7 comparison, Interfor stated that the additional volume would most certainly have been able to support an increase in short-term timber supply.

I agree that VDYP7-based volume estimates are the best available information for the Mid Coast TSA and, had they been applied in the analysis, the total growing stock for natural stands in the base case would be higher by about 5.5 percent. Therefore, I must consider whether the additional volume should be applied to the mid-term of the forecast or to the short term, as suggested by Interfor. In doing so, I am mindful that the base case includes a mid-term harvest level that is below both the short-term and long-term levels, and that in such cases, a harvest flow option that minimizes the mid-term decline is preferable in transitioning to the long-term harvest level. I am also mindful that increasing the initial harvest would do little to alleviate the uncertainty of the critical decades in mid-term period which, as I described in '*Base case for the Mid Coast TSA*'. Therefore, I do not believe it is appropriate that I use the higher natural stand volume estimates from VDYP7 to increase the initial harvest level in the base case. Instead, I consider that the additional volume will provide a safeguard to the projected mid-term harvest level. Based on the assessment provided in the timber supply analysis report, I will account for a 24 500 cubic metres per year (or about 3.6 percent) underestimation in the mid-term harvest level projected in the base case, as discussed '**Reasons for Decision**'.

Expected rate of growth

- *site productivity estimates*

For all existing stands, the site index values used to create analysis units were derived from the forest inventory. For managed stands, yield estimates were developed from adjusted site index values, the derivation of which was documented in the report *Site Index Adjustment of the Mid Coast Timber Supply Area* (Timberline Natural Resource Consultants Ltd., 2009). I have reviewed the steps of the site index adjustment procedure and the results obtained for leading species and site class. I note that for western redcedar (cedar) and for western hemlock the procedure resulted in significant increases in the estimated site index, of 7.3 metres and 9.8 metres, respectively and nearly doubled the average mean annual increment for managed

stands in the TSA. I note also that the adjusted site index is only relevant to stands post harvest when they transition to managed-stand analysis units.

In their submission on May 18, 2010, Interfor indicated that 18 percent of the THLB did not receive site index adjustment, which they stated, was another factor that should be considered when evaluating the mid- to long-term harvest levels projected in the base case. In response, I note that information contained in Table 25 of the 2009 data package, which describes the stocking assumptions applied in the base case, indicates that over 90 percent of the THLB regenerates to cedar- or hemlock-leading stands which potentially receive some level of adjustment.

In their submission dated June 18, 2010, the Heiltsuk First Nation inquired about the basis for changes to site index estimates and questioned the expectation that adjusted site index would act to offset the downward pressure on timber supply introduced with ecosystem-based management. In response I note that the estimates of stand growth in the inventory that were based on growth information obtained from old-growth stands typically underestimate the productivity of second-growth stands. The study undertaken by the licensee group followed accepted procedures and the results are consistent with similar studies conducted throughout BC, including other coastal management units.

From my review of the procedures for obtaining and applying site index values in the analysis, I am satisfied that the best available information was used and that the base case projection is reliable in this regard. If new information regarding managed stand site index for species other than hemlock and cedar becomes available it will be considered in future determinations.

- *volume estimates for managed stands and operational adjustment factors*

In the base case, existing stands that were Douglas-fir, hemlock- or balsam-leading and less than 27 years of age or stands that were cedar- or cypress-leading and under 21 years of age were considered managed stands. For these stands, volume estimates were based on MFML's Batch TIPSY (version 4.1c) projections using the standard provincial operational adjustment factors (OAF) of 15 percent for OAF 1 and 5 percent for OAF 2. OAF 1 accounts for factors, such as small stand openings, uneven tree distribution, and endemic pests and diseases that affect yield curves across all ages; whereas, OAF 2 accounts for factors whose impacts increase over time such as decay, waste and breakage.

From my observations of regenerating stands in managed coastal forests, an OAF 1 value of 15 percent may be higher than what is generally experienced in current practice. Although no local information on OAF values were compiled for use in this timber supply analysis, I understand that a study has been planned and may be completed in the future. If available, reliable, locally-developed estimates of OAF values for the Mid Coast TSA will be considered in future AAC determinations. For this determination, I accept that the best available information has been used in estimating the volume yields applied for regenerating stands in the base case analysis.

- *minimum harvestable ages*

The assumed minimum harvestable ages (MHA) applied in the base case forecast were based on the age at which a volume threshold was achieved, and/or 90 percent of the culmination of mean annual increment was reached. The MHAs are detailed in Table 37 of the 2010 data package,

and I note that a sensitivity forecast described in the 2010 timber supply analysis report showed that the mid-term timber supply was sensitive to an increase in MHAs. When MHAs were increased by 10 years the mid-term harvest level was reduced by eight percent. This is further indication that the period when harvesting is in transition from natural to managed stands is a critical point in the base case forecast. Any delay in the timing at which managed stands achieved merchantability (i.e., increase in MHA) has the potential to impact the harvest flow.

District staff indicated to me that the MHA assumptions were reasonable for the conventional portion of the land base. However, they were uncertain about the MHA assumptions applied to some second-growth stands in helicopter accessible areas, particularly naturally regenerated stands. This was because, at the time of the analysis there had been very little harvesting of these stands in the Mid Coast TSA.

I am satisfied that overall the modelling in the base case projection incorporates values for harvestable ages that are reasonable and adequate for use in support of this determination. If improved information regarding harvest ages in helicopter accessible areas becomes available it will be incorporated in the next determination.

- *harvest profile*

I have reviewed the annual harvest projected for the 300-year time horizon modelled in the base case forecast, by individual species and by leading species. In the initial decade, about 39 percent of the volume harvested was cedar or cypress and approximately 37 percent was hemlock or balsam. Douglas-fir and spruce make up the remainder. After the initial period, during the transition to managed stands, the proportion of cedar and cypress harvested declined in the forecast and the proportion of hemlock and balsam increased so that by the seventh decade, approximately 19 percent of the volume harvested was cedar or cypress and approximately 69 percent was hemlock or balsam. The analysis report author indicated that this trend was defined in part by past harvest activity. Approximately 40 percent of hemlock stands were initially below minimum harvestable age which was twice the percentage of cedar stands that were below minimum harvestable age. The proportion of spruce harvested, which was initially 18 percent, declined significantly through the transition to managed stands. Spruce was a common secondary species in natural stands and was assumed to be an infrequent component of managed stands.

The decline in the projected cedar harvest in the mid-term of the base case prompted district staff to request a sensitivity analysis that explored the timber supply implications of maintaining a minimum harvestable volume of cedar in each period of the forecast. The sensitivity forecast required that at least 30 percent of the harvest come from cedar-leading stands in each period. Relative to the base case, the harvest level was four percent lower in the immediate term and five percent lower in the mid-term.

The Heiltsuk First Nation in their letter dated June 18, 2010, commented that the decline in cedar, spruce and Douglas-fir harvest in the short- and mid-term of the forecast (illustrated in Figure 18 of the analysis report) was a problem. They stated that EBM requires a harvest that is representative of the forest profile and, more importantly, that the Heiltsuk have traditional and contemporary uses of cedar and wish to maintain the current amount of cedar on the land base or increase it to historic levels. The letter also included a recommendation that I not use the base

case for my determination and instead adopt the sensitivity forecast that limits cedar contribution.

At the March 18, 2010, information-sharing meeting representatives from the Nuxalk Nation asked about the amount of cedar actually being harvested and how it compares to other species. They were advised by representatives from Forsite that, although an analysis of current actual harvest levels was not conducted as part of the analysis project, recent market conditions indicate that there is currently a preference for cedar and that is makes up a high proportion of the current harvest in the Mid Coast TSA.

In a letter dated June 4, 2010, Western Forest Products described the company's review of the harvest billing information for the TSA collected in period from 1999 to 2009, which suggested that operators have not been using the THLB growing stock profile indicated in the analysis report (as 50 percent hemlock/balsam and 30 percent cedar growing stock) and that the actual production had been almost reversed with about 55 percent of the harvest being redcedar, and about 29 percent hemlock/balsam. The company also reported that, even when younger stands (primarily hemlock) were not considered and an allowance was made for cedar in areas harvested outside the THLB, there was still a substantial difference between the inventory profile and harvest profile over the past decade which they believed indicated that the operability projection was optimistic relative to historic practice.

Regarding concerns raised by the Heiltsuk First Nation, I note that Figure 18 in the analysis report illustrated the trend in harvest volume and did not provide information about the occurrence of unharvested cedar over the timber supply area. Over 85 percent of the forest area in the TSA was not THLB, was not scheduled for harvesting and was not reflected in Figure 18. In addition, the base case included harvesting constraints to ensure the forecast was consistent with landscape-level objectives set out under Objective 14 of the South Central Coast and Central and North Coast Ministerial Orders and THLB reductions to account for the objectives in Part 2 of the same orders. I have also considered that licensees are required to include results or strategies in FSPs that are consistent with the cultural heritage resource objectives set by government including those set out in Part 2 of ministerial orders and that government has developed "*Guidelines for Managing Cedar for Cultural Purposes*" which provides information to assist managers who must develop results or strategies for cedar as a cultural heritage resource. For these reasons I believe that harvesting at the levels projected in the base case are unlikely to reduce cedar presence in the TSA to a level below what will be required by the Heiltsuk and other First Nations to meet needs for traditional and contemporary cultural uses.

Regarding the concern raised by Western Forest Products in relation to the proportion of cedar currently harvested in the TSA, I note that similar trends were also seen by district staff using the Harvest Billing System (HBS) who determined that cedar/cypress comprised 67 percent of the harvest in 2008 and 56 percent of the harvest in 2009. I am mindful these comparisons of the species profile in the THLB (inventory estimates) and the species profile from HBS (scaled volumes), although insightful, are subject to uncertainties related to the inventory. Licensees in other management units have opined that the THLB profile is more appropriately compared to the inventory profiles of cutblocks using GIS analyses. MFML employees at FAIB have provided me with this type of comparison for the Mid Coast TSA. The results showed that cedar/cypress made up 53 percent, 40 percent and 30 percent of the total cutblock volume harvested in the years 2007, 2008 and 2009, respectively. These figures are roughly consistent

with the 41 percent of THLB volume that is cedar/cypress defined using the new EOA. However, I also note that the overall harvest level in the 2009 was well below the AAC.

As noted in '*age class structure and species profile*', the currently defined THLB included more cedar/cypress-leading stands, and fewer hemlock-balsam-leading stands than the 1999 analysis, such that cedar-cypress contributed roughly one-half of the total available volume in the THLB defined in the 2010 analysis. This change in the land base brings the THLB profile for the TSA more in line with actual harvesting performance, which in past years included a higher proportion of cedar and cypress. Nonetheless, the level of performance in hemlock/balsam–leading stands, particularly old-growth stands, continues to be an issue of concern in the TSA warranting further monitoring and I have issued a related instruction in '**Implementation**', that licensees and district staff continue to monitor the volumes harvested from the species profile in the inventory for the TSA. From my review of the information discussed above, I am satisfied that the best available information was used and that the base case projection is reliable in this regard.

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

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

Silvicultural systems

Two silvicultural systems are in current practice in the Mid Coast TSA, clearcut with reserves and dispersed retention. Clearcut with reserves is a variation of clearcutting that retains uniformly spaced or small groups of trees for purposes other than regeneration. In the base case forecast, over 95 percent of the THLB was in stands that were projected to be harvested using clearcut with reserves. The amount of retention assumed for these areas was 23 percent, which was the average reported for the TSA between 2001 and 2008, inclusive. Since much of this retention was observed to overlap with other land base exclusions (e.g., riparian areas) it was assumed for the base case that only 4.4 percent of the 23 percent was incremental to all other land base reductions. This assumption was based on an EBM monitoring report produced by Symmetree Consulting Group (2007) and is discussed in greater detail under "*EBM Stand-level Retention*". It was also assumed that, under clearcut with reserves, retained trees would be located in groups along cutblock margins or as peninsula extending into the blocks, and that shading from retained trees would not significantly influence the growth of regenerating trees and that retained trees would not be harvested for a full rotation.

In the dispersed retention silviculture system, which was assumed to apply to five percent of the THLB, individual trees are retained within the cutblock for the purpose of structural diversity or non-timber objectives, so that much of the cutblock was within one tree-height from a retained tree or the cutblock boundary. In the Mid Coast TSA, the application of dispersed retention in the future will be different from past practices, so in the analysis different assumptions were applied for *historic* and *future* dispersed retention.

Stands with historic dispersed retention occupied 1678 hectares of THLB, which was about one percent of the total THLB, and were most commonly located in areas subject to partial retention and modification visual quality objectives (VQOs) as well as areas not subject to VQOs. The base case assumed that 34 percent of the pre-harvest volume in these stands would be retained following harvesting and the yield tables used to model these stands were adjusted

downward to account for the loss in growing space and shading from the retained trees. It was assumed in the base case that the retained trees would be recovered when the stands were harvested in subsequent rotations.

Stands projected to be harvested in the future with dispersed retention were located only in areas with visual management objectives including all stands with preservation and retention class VQOs and 10 percent of the stands with partial-retention class VQOs. They comprised 7185 hectares, which is about five percent of the THLB. The base case assumed that 30 percent of the pre-harvest volume in these stands would be retained during harvesting, of which two-thirds would be in group retention and one-third would be individual trees dispersed over the cutblock. Most of the group retention was expected to overlap reserves already excluded from the THLB for other reasons, so only a 4.4-percent area reduction was applied to account for the group retention. For the dispersed retention, a 10 percent area reduction was applied to account for retained trees and the yields estimates of regenerating stands were adjustment downward to account for the productivity losses from shading by retained trees.

District staff expressed concern that the retention assumptions applied for the clearcut with reserves silviculture system may be too low and that shading from internal group retention, which was not accounted for in the base case, may reduce the growth of regenerating trees to levels below those assumed in the base case. For this reason, the licensee group was asked to provide maps that exemplified cutblock layout under EBM requirements in the Mid Coast TSA. The cutblocks shown in these examples were generally consistent with clearcut with reserves silviculture system; however, district staff noted that several of the blocks included a significant amount of group retention that was located within the cutblocks boundaries. The MFML's Growth and Yield Specialist indicated that the group retention shown in several examples would likely negatively affect the growth of regenerating trees, and that it would have been preferable to account for that affect in the managed stand yield tables.

Interfor indicated in their submission from May 18, 2010, that their differences with government staff reviewing the analysis stemmed from interpretations of how past practices (dispersed retention in particular) describe retention harvesting that is occurring now. Interfor stated that current cutting permits illustrate that aggregate retention is occurring in predominantly visually constrained areas and areas with other constraints such as terrain stability concerns which is consistent with what was modelled in the base case. In a submission provided on June 22, 2010, Interfor further commented on the methods used to model future dispersed retention. They submitted that the 10 percent removal from the THLB was incorrect and the dispersed retention component should have been modelled using a separate yield curve.

To summarize, I believe licensees are responsibly retaining trees during harvest, consistent with objectives for FRPA and EBM; although, in some cases retention exceeds the minimum EBM requirements. Over time, application of retention harvesting will likely vary with fluctuations in economic conditions and as forest practices associated with EBM are refined. Forest managers should be aware that higher levels of retention than are explicitly required will have implications for the timber supply since the growth of regenerating stands are affected by high retention levels, and that timber supply implications of these practices need to be carefully assessed during the development of site level prescriptions. The information and management examples provided to me indicate that influence of retained trees in dispersed retention were adequately modelled in the base case, but the influence of trees in group retention was not fully accounted for in the base case. Although the negative influences of group retention on regeneration

productivity is likely less than that of dispersed retention, the overall timber supply impact may be significant since 95 percent of the THLB falls within areas to be managed using the clearcut with reserves silviculture system. On this basis, I conclude that the managed stand yield estimates for clearcut analysis units were overestimated in the base case. Since these stands will not be harvested until several decades from now and the amount that yields were overestimated is unknown, I am accounting for a small, unquantified overestimation of the mid- to long-term harvest levels projected in the base case, as noted in '**Reasons for Decision**'.

In preparation for the next AAC determination, I encourage the licensee group to work with district staff to resolve the uncertainty regarding the growth and yield implications associated with high levels of group retention in the Mid Coast TSA and to improve forest cover reporting for blocks with high residual basal area in Reporting Silviculture Updates and Land Status Tracking System (RESULTS). Furthermore, I have instructed district staff to continue to monitor silvicultural system usage in the TSA and the resulting levels and distributions of the ensuing forest cover retention as indicated in '**Implementation**'.

Genetic improvement

Tree planting with western redcedar and coastal Douglas-fir produced from select (class 'A') seed was accounted for in the 2010 analysis by applying an upward adjustment to the managed stand yield estimates for these species.

The Heiltsuk First Nation inquired about the evidence to substantiate the projected higher yields from select seed and expressed concern that use of select seed will decrease biological diversity and that genetic gain tends to focus on one or more traits which could, if deployed widely, increase susceptibility to stresses like insect epidemics. In response, I note that the tree improvement program in BC is aimed at maintaining and enhancing the value of forest tree genetic resources through selection and breeding for desirable traits, such as increased timber volume. Additionally, MFML also carefully manages genetic resilience through seedlot registration, genetic diversity standards and seed transfer standards, and genetic conservation is undertaken by managing seed collections. The estimated average genetic gain of a seedlot, which is its genetic worth, is expressed as the percentage gain in volume expected at harvest age. Genetic worth is determined from extensive testing and field performance of seedlot parent trees across multiple sites and conditions for a specific geographic zone. In the Mid Coast TSA, the yield uplift from select seed use was limited to western redcedar and Douglas-fir within the maritime low seed planning unit.

I have reviewed the accounting for genetic gain in the timber supply analysis, which I consider to reasonably reflect current practice for planted areas.

(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 objectives

The Mid Coast TSA is entirely within the area that is subject to the Coast Land Use Decision. Approximately 55 percent of the TSA is subject to the Central and North Coast Ministerial Order (amended in March, 2009) and the balance of the TSA is subject to South Central Coast Ministerial Order (amended in March, 2009).

- *visually sensitive areas*

For the Mid Coast TSA, the visual quality objectives (VQOs) were established in 2004 under Section 17 of the GAR and originate from visual quality classes (VQC) described in a visual landscape inventory completed in 1999. The scenic areas were initially made known under the Forest Practices Code by the district manager in 1997, and refined by the district manager in November 1998. I have reviewed the procedures used to incorporate VQOs in the base case forecast. These include the amount of area modelled with preservation, retention, partial retention, and modification VQOs, as well as the associated visual absorption capacities, required green-up heights, and maximum areas permitted to be below visually effective green-up height. I note that while VQOs were applied to about one-fifth of the entire productive land base in the TSA, a large proportion of this area was outside the THLB in lands that contributed to the achievement of the visual quality objectives without constraining timber supply.

From my review of the procedures followed in the timber supply analysis, I am satisfied that the base case forecast adequately accounts for the implications of managing to meet VQOs in the TSA.

- *wildlife habitat areas*

In the Mid Coast TSA, the provincial Identified Wildlife Management Strategy (IWMS) has resulted in the establishment of wildlife habitat areas (WHAs) and the implementation of general wildlife measures (GWMs) for grizzly bear and sandhill crane. In the timber supply analysis 3755 hectares were excluded from the THLB specifically for the grizzly bear WHAs. Since grizzly bear habitat protection in the Mid Coast TSA was in place before the Forest Practices Code, the timber supply impact of these WHAs was deemed by the Ministry of Environment (MOE) to be incremental to the IWMS policy limit on timber supply impacts. Several sandhill crane WHAs were established after the data package was completed so there was no reduction applied for those WHAs. District staff advised me that the sandhill crane WHAs overlap approximately 79 hectares of THLB.

Government intended that timber supply impacts of the IWMS will be limited to one percent of the timber supply within each district at the time the strategy was implemented (i.e., TSR 2). Although much less than one percent of the THLB in the Mid Coast TSA is within WHAs, MNRO staff advised me that they expect more WHAs will be established within the Mid Coast TSA in the future to address gaps in the habitat protection needs for species at risk that may persist following completion of a strategic landscape reserve network for the area.

In addition to WHAs, the MNRO has proposed Specified Areas (SA) for tailed frog, northern goshawk, and marbled murrelet for the Mid Coast TSA. These draft SAs were designed to complement old-growth retention objectives set out in the land-use orders and are not expected to have an additional impact on timber supply beyond what is required to address the land use orders. For this reason the proposed SAs were not incorporated into the timber supply analysis.

In March, 2006, a Notice under Section 7(2) of the FPPR was issued that specifies the amount, distribution and attributes of wildlife habitat required for the survival of species at risk in the district. This notice specifies that the amount of suitable nesting habitat for marbled murrelet which occur in the non-contributing land base defined during TSR 2 be maintained within the district. Since new EBM objectives and protected areas removed large areas from the THLB, the base case forecast did not apply a constraint specifically for marbled murrelet nesting habitat.

However, MFML staff confirmed that the amount of inventoried nesting habitat in the non-contributing land base was greater than the amount of inventoried nesting habitat in the TSR 2 non-contributing land base. Therefore, the base case was consistent with the Section 7(2) notice requirements for marbled murrelet.

In summary, the grizzly bear WHAs that have been established within the Mid Coast TSA were accounted for in the base case. MNRO staff responsible for administering the IWMS program in the district advised me that future WHAs may be established within the Mid Coast TSA – the timing of such GAR actions will recognize the Strategic and Detailed Landscape Reserve Design Planning process which is currently underway in the central coast, but could extend beyond this planning window (which is scheduled to be complete by March 2014). Future WHAs will address outstanding habitat protection needs (i.e., conservation gaps) for IWMS species where such needs are identified. Although I am mindful that current government policy has limited the timber supply impact of the IWMS program to one percent of the AAC within each district and that WHAs established elsewhere in the district may limit the timber supply impacts of future WHAs within the Mid Coast TSA, I believe it is likely that additional WHAs will be established within the TSA. The amount of THLB that will be impacted in the future is unknown at this time; however, MNRO staff advised me that they anticipate up to one percent may eventually be affected by futures WHAs, which is proportional to the IWMS policy limit for the district. For this reason, I have concluded that the harvest levels projected in the base case have been overestimated by one percent, as discussed in '**Reasons for Decision**'.

- *ungulate winter range*

Ungulate winter range (UWR) areas for mountain goat were officially established in the Mid Coast TSA in February, 2007, by an order under the GAR. The expectation was that these UWRs would not significantly impact timber supply since they were primarily located in lands outside the THLB or in areas where harvesting is constrained for other resource values. The UWR order specified that timber harvesting should not impact more than 10 percent of the total habitat area in each landscape unit. In the base case forecast, 90 percent of the UWR area in each landscape unit was spatially reserved from harvesting by selecting non-THLB lands, and then if required, THLB starting with the lowest productivity stands. This resulted in 65 hectares being excluded from the THLB.

UWR for coastal black-tailed deer were officially established in February 2007. The GAR order identified specified areas (SA) where designated deer winter habitat requirements must be met and indicates the percentage of winter habitat that must be maintained as mature forest cover in the SA. The base case forecast applied forest cover requirements that were consistent with the order. Mature forest cover included stands greater than 141 years old or 121 years old, depending on which landscape unit they were located in. The percentage of mature forest that was to be maintained also varied by landscape unit and was either 20 percent or 25 percent of the productive forest area. Information provided in the timber supply analysis report indicated that, overall, the UWR requirements did not significantly limit timber availability further to other harvesting constraints and the analyst indicated that a similar trend was seen in most individual landscape units. However, MNRO staff advised me that the GAR order specifications on minimum crown closure and tree species attributes were not applied in the base case and that these may reduce the flexibility to locate habitat in non-THLB areas from what was assumed in the base case.

MNRO staff commented that the modelling assumptions for mountain goat UWR, which preferentially selected low productivity THLB to meet the habitat requirements, may be inconsistent with the intent of the GWM as it likely results in a reduction of habitat quality. MNRO staff also indicated that the modelling approach for black-tailed deer UWR, which did not incorporate crown closure and tree species attribute requirements, likely underestimated the pressure on timber supply from the GWM.

Regarding mountain goat UWR, I conclude that the base case forecast reasonably reflects current management and there is minimal risk that the method used to model mountain goat UWR overestimated timber supply since most of the UWR is in non-THLB lands. Regarding black-tailed deer UWR, I agree that the simplified modelling methods used to account for deer UWR objectives assume a higher degree of management flexibility than is actually available to operational planners. However, the degree to which the modelling method has led to an overestimation of timber supply is not known. Since the analysis report indicated that the deer UWR constraints, in aggregate, were easily satisfied in the short term, it appears that the greatest risk occurs in the mid-term part of the forecast. For these reasons, I conclude that initial timber supply level projected in the base case forecast is reasonably consistent with the established UWR objectives. Although there is uncertainty as to the extent to which UWR habitat requirements can be met in the non-THLB lands, this is likely to be reduced once strategic landscape reserve design work has been completed in the TSA. To reduce the uncertainty for the next timber supply analysis, I request district staff to monitor where and how UWR habitat is maintained in the TSA, and I have included an instruction to that effect below, in '**Implementation**'.

- *EBM objectives for high value fish habitat*

Objective 9 of the March, 2009 South Central Coast and Central and North Coast Orders, is intended to protect high value fish habitat (HVFH). Accounting for this objective resulted in the exclusion of 1867 hectares from the THLB (or about 1.5 percent of the THLB).

HVFH streams were assumed to be primarily alluvial streams and were identified using 1:20 000 scale maps to select streams with a gradient of five percent or less on terrain with slopes five percent or less and under 900 metres in elevation. These criteria were intended to capture most of the alluvial streams in the TSA. The riparian zone along these streams was identified by buffering both banks of each steam by 40 metres and 60 metres on the outer and inner coasts, respectively. The buffer area was fully reserved from harvesting. The land use orders also specify that a zone of 150 metres on each side of the lower portion of the Kimsquit River is HVFH, which was also applied in the base case. Key spawning habitat along marine shoreline was identified using nautical charting information that correlated with the occurrence of HVFH (shallow water depth, soft seabed). These portions of the shoreline were then identified and buffered in the same manner as HVFH streams.

MNRO reviewers commented that the analysis did not make use of HVFH mapping developed by the MOE with input from the Department of Fisheries and Oceans and that the analysis would have likely benefited if combined with the interagency information. Although these data were made available to them, the licensee group opted to apply the approach that focussed on selecting alluvial steams using 1:20 000 maps, described above, which they believed to be more consistent with the intent of the March, 2009 South Central Coast and Central and North Coast Orders.

In summary, the approach used to incorporate the objectives for HVFH into the base case used the best available information and reasonably reflected current practice. However, given the lack of a field-verified HVFH inventory and the limited performance demonstrated to date, there is uncertainty whether the analysis sufficiently captured all HVFH streams. In view of this uncertainty, I have issued an instruction, in '**Implementation**', for the agencies involved in the timber supply review to work collaboratively to improve information on the nature and extent of HVFH in the TSA and incorporate it in the next timber supply analysis.

- *EBM objectives for forested swamps*

Objective 11 of the 2009 land-use orders is to maintain the natural ecological function of forested swamps by managing forests that occur adjacent to these areas. Because they are relatively rare in coastal BC, and typically have marginal timber values on them, forested swamps were assumed to be addressed in the land base reductions discussed under '*EBM objectives for stand-level retention*'.

Reviewers at MNRO commented that the modelling approach for forested swamps may not have resulted in accurate impact calculations. They suggested that the assumption that forested swamps would be addressed through stand-level retention may be sensible for smaller forested swamps, but larger forested swamps (greater than one hectare) often require additional management and should have been accounted for in the stand-level retention assumptions. MNRO reviewers also proposed that the land base reductions for forested swamps in the Mid Coast TSA could be extrapolated from information prepared for the Kingcome TSA timber supply analysis (2009).

In conclusion, I recognize that there is an unquantified level of uncertainty about analysis assumptions for forested swamps due to the lack of a field-verified inventory. However, given the relative infrequency of forested swamps, I believe the risk to timber supply in the short-term is small. For this determination, I am satisfied that the base case forecast adequately accounted for management practices under Objective 11 for forested swamps.

- *EBM objectives for upland streams*

The base case timber supply forecast took into consideration Objective 12 of the 2009 land use orders. The intent of this objective is to maintain the natural ecological function of upland streams and to provide for the maintenance of hydrological and ecological processes within specific watersheds. The objective does not require management of every small upland stream, but does require that functional riparian forest exist on at least 70 percent of upland portions of watersheds listed in Schedule 3 of each order.

In the analysis, upland forest was assumed to be the portion of a watershed occupied by upland streams and upland streams were defined as streams with slopes greater than five percent and classified as stream classes S4, S5 and S6 in the FPPR. Management for this objective was accounted for in the base case by application of a constraint that did not allow more than 30 percent of the upland forest to be below a hydrologically effective green-up height of nine metres. Given computational limitations, this constraint was applied to watersheds over 100 hectares in size.

MNRO reviewers commented that limiting application of the constraint to watersheds greater than 100 hectares may not have captured the potential impact on smaller watersheds. Although,

I agree this may constitute a small overestimation of timber supply relative to the base case, I believe the risk is negligible given that the analysis report showed that the constraint applied elsewhere did not appear to limit timber harvesting further to other harvest constraints. From my review I am satisfied that Objective 12 of the land-use orders was adequately accounted for in the base case forecast.

- *EBM objectives traditional forest resources*

Part 2 in both the South Central Coast and Central and North Coast Orders sets out five objectives for the management of resources and features important to First Nations.

Objective 3 deals with First Nations' traditional forest resources' and is intended to provide for the maintenance of forest resources traditionally used by First Nations, which can include merchantable timber accessed by First Nations through Free Use Permits. For six bands within the Mid Coast TSA (Gwa'sala-'Nakwaxda'xw, Heiltsuk, Kitasoo-Xai'xais, Nuxalk, Ulkatcho and Wuikinuxv) a total of 1500 cubic metres per year was assumed to be harvested within the THLB and in excess of the AAC. Additional volume may also be logged in non-THLB areas (parks, riparian, etc.) but is not reflected in the analysis, though it may assist in addressing EBM cedar objectives.

At the April 7, 2010 information-sharing meeting, and again in a written submission dated June 18, 2010, the Heiltsuk First Nation questioned the analysis assumptions that allotted a total of 1500 cubic metres per year for traditional and cultural uses by First Nations. They stated that the amount is not adequate to meet cultural and housing needs. At the March 13, 2009 information-sharing meeting, the Kitasoo-Xai'xais First Nation questioned the same assumption indicating the amount needed may change in the future and that they did not want this amount 'written in stone'.

In response to these concerns, I note that base case assumptions applied for Objective 3 were an attempt to make some account for timber use by First Nations that is over and above the volume projected to support the AAC. It was not intended reflect the total use or limit on timber use by First Nations. As noted above, the MNRO may provide First Nations access to volume apportioned to the Forest Service Reserve or use other means to assist First Nations in obtaining timber for traditional and domestic purposes. Therefore, for the purposes of this determination, I accept the assumption used in the base case. In the event that there are significant changes in the volumes required for First Nations, this information can be considered at the time of the next determination.

- *EBM objectives for First Nations*

Part 2, Objectives 4, 5, 6 and 7 of the land-use orders are for the maintenance of First Nations' forest resources and features, including: traditional heritage features; culturally modified trees (CMTs); monumental cedar; and the stand-level retention of cedar. I have reviewed the procedures used to account for these objectives in the base case forecast and I note the following.

After discussion with First Nations forestry advisors, the licensee group assumed that land base reductions associated with traditional heritage features, CMTs, monumental cedar and stand-level retention of cedar would be reasonably accounted for by applying a non-spatial area removal equal to 1.3 percent of the THLB in all stands, incremental to other land removals. The estimate was derived from information developed in the 2009 Kingcome TSA timber supply

analysis where the reduction for known cultural features was determined and doubled. This value, which was applied in the base case, represents the incremental impact to the THLB after other removals (e.g. parks, conservancies, biodiversity areas and inoperable stands). The expectation was that these other lands would also be used to achieve the EBM objectives for First Nations.

The Heiltsuk First Nation suggested the 1.3 percent reduction in THLB for Objectives 4, 5, 6 and 7 was arbitrary and insufficient and that applying assumptions from the Kingcome TSA to the Mid Coat TSA was contrary to Strategic Land Use Planning Agreement (SLUPA) and Land and Resource Protocol Agreement (LRPA) commitments.

At an information-sharing meeting held March 13, 2009, a representative from each of the Wuikinuxv Nation and the Kitasoo-Xai'xais First Nation voiced an opinion about the reduction applied for archaeological sites. Both indicated that the non-spatial approach was agreeable, as First Nations do not want a map depicting the exact locations of archaeological sites available to the public.

In response to the comments by First Nations, I point out that the assumptions were formulated to approximate the timber supply implications of EBM objectives for First Nations. They do not limit operational management activities that may be required in the future to meet these objectives or other government-to-government commitments such as the SLUPA and LRPA. The assumptions were deemed by the licensee group, following confirmation with forestry consultants that participated on behalf of the Heiltsuk and Gwa'sala'Nakwaxda First Nations, to be the best available information about how much harvestable land will need to be set aside from operations to achieve Objectives 4, 5, 6 and 7.

In conclusion, I am satisfied that the base case applied the best available information about the amount of THLB that will be set aside from harvesting in order to achieve EBM objectives for First Nations forest resources and features. However, there is significant uncertainty about this information and I ask that licensees and district staff work with local First Nations to collect locally applicable information about the management for these resources and features in the Mid Coast TSA before the time of the next AAC determination, which I have addressed in '**Implementation**'.

- *EBM objectives for stand-level biodiversity*

The South Central Coast and the Central and North Coast Orders include Objective 16 which is for the maintenance of forest structure and diversity at the stand-level. The objective calls for stand-level retention of at least 15 percent and, for cutblocks that are 15 hectares in size or greater, for half of the retention to be within the cutblock boundary. I have reviewed the procedures used to model stand-level retention in the base case forecast and I note the following.

The analysis assumed that most of the stand retention in the TSA will be distributed in patches located along cutblock edges – and that these patches will be retained for a full rotation. Information from Reporting Silviculture Updates and Land Status Tracking System (RESULTS) was used to determine the average amount of group retention in the TSA, and information from an EBM monitoring report by Symmetree Consulting Group (2007) was used to determine the proportion of retention that overlapped with other THLB removals. These sources indicated that the average level of group retention in the TSA has been 23 percent and that 18.6 percent of that overlapped with areas previously excluded from the THLB in the analysis. Therefore, the group

retention that was incremental to other THLB exclusions was estimated to be 4.4 percent, which was the amount that all contributing stands in the THLB were reduced by to account for the EBM objective for stand-level biodiversity. As discussed in "s*ilvicultural systems*", no reduction was applied to yield tables to account for the influence of shading by retained trees.

I conclude that procedures used to model stand-level biodiversity in the base case forecast adequately reflected current management in the Mid Coast TSA. However, as discussed in 'silvicultural systems', the negative influence of group retention on the productivity of regenerating trees was not factored into the analysis which means that managed stand yields were overestimated in the base case. I ended my considerations in '*silvicultural systems'* by concluding that the overestimation of managed yields results in an unquantified overestimation of the base case mid- to long-term harvest level. This one conclusion serves to resolve my findings both in respect of silvicultural systems, and of stand-level biodiversity considerations.

- *EBM objectives for landscape-level biodiversity*

As described in the timber supply analysis report, the base case forecast took into consideration Objective 14 of the 2009 South Central Coast and Central and North Coast Orders. This objective is to ensure that a specified amount of old forest is maintained in each ecosystem surrogate and that less than half of the productive forest in each ecosystem is mid-seral. Old forest included stands that are 250 years or older. Mid-seral forests included stands that are at least 40 years old but not more than 80 years old, in the CWH biogeoclimatic zone, or not more than 120 years in other biogeoclimatic zones. The objective was modelled in the base case by implementing constraints for each ecosystem surrogate within each landscape unit that ensured the amounts of old forest and mid-seral forest were maintained within specified levels, or that stands were recruited to achieve the specified targets within the timeframe set out in the order.

The base case forecast applied the 'default target' set out in the 2009 land-use orders. A sensitivity forecast was developed to examine the implications of applying a less constraining 'risk managed target' which is allowed under the orders when certain management conditions are met. The harvest level in this sensitivity forecast was two percent greater than the base case. Staff advise me that no-licensee in the TSA is currently managing to the risk managed targets.

MNRO staff commented that the modelling approach did not consider Objective 14(7) of the orders which states that, wherever practicable, old forest retention should include focal species habitat and other features. For this reason, the MNRO reviewers believe the base case forecast likely underestimated the incremental impact of the biodiversity objective. District staff advise me that it is unknown if and to what extent the requirement to overlap old forest representation areas and focal species habitat would reduce the THLB available for timber harvesting.

In conclusion, I acknowledge that there is some uncertainty regarding the base case assumptions about how Objective 14(7) will influence landscape-level reserve design in the TSA and about how the risk-managed targets will be applied in the future. However, based on the information presented to me, I have found no basis for adjusting the base case forecast for either of these uncertainties, which to some degree are compensating. Therefore, I am satisfied that the landscape-level biodiversity objectives for the Mid Coast TSA were adequately modelled in the base case forecast.

- *EBM objectives for red- and blue-listed plant communities*

Objective 15 of the 2009 land-use orders is for the protection of blue-listed and red-listed plant communities. The protection of blue-listed plant communities was factored into the timber supply analysis by reducing the THLB in each stand by three percent. No reduction was applied for red-listed plant communities since these were assumed to overlap other land removals. I have reviewed the accounting for these areas in the analysis, and make the following observations.

The THLB reduction applied for blue-listed plant communities was derived from an analysis of the Kingcome TSA which used a biophysical model to predict the occurrence of blue-listed plant communities and assess how much THLB would be reserved to achieve 70 percent protection. The results suggested that 3.8 percent of the THLB in the EBM zone would need to be set aside to protect blue-listed plant communities, in addition to other land removals. After considering the methods applied in the biophysical model and those used to identify plant communities in the field, the licensee group expected that blue-listed plant communities would occupy only a subset of the mature site series predicted by the biophysical model. Therefore, they reduced the reduction factor from 3.8 percent to 3.0 percent. The data package also stated that operational experience suggests an incremental impact for blue-listed plant communities is unnecessary.

Comments made by reviewers at MNRO suggested that land base reductions applied for Objective 15 contain substantial uncertainties and that the full equivalent land base reduction of 3.8 percent may be more appropriate.

I note that, without the Terrestrial Ecosystem Mapping information, there is a high degree of uncertainty about the occurrence of red-listed and blue-listed plant communities. Currently, modelling results from the Kingcome TSA represent the best available science for assessing the land base that will be required to protect these plant communities. Direct extrapolation of those results to the Mid Coast TSA suggests that a THLB reduction of 3.8 percent is appropriate, which is 0.8 percent greater than what was applied in the base case. Therefore, I will account for a 0.8 percent overestimation in the harvest levels projected in the base case, which is approximately equivalent to 6000 cubic metres per year as noted in '**Reasons for Decision**'.

- *EBM objectives for grizzly bear habitat*

Objective 17 of the 2009 land-use orders spatially identifies grizzly bear habitat and requires that it be maintained as functional habitat. The objective was accounted for in the timber supply analysis by retaining 90 percent of the grizzly bear habitat in Schedule 2 of the South Central Coast Order, 90 percent of the of the Class 1 habitat in Schedule 2 of the Central and North Coast Order and 50 percent of the Class 2 habitat in Schedule 2 of the Central and North Coast Order. This resulted in the exclusion of 2662 hectares from the THLB. I have reviewed the accounting for Objective 17 in the timber supply analysis, and I am satisfied that it reasonably reflects current practice, with the following observation and qualification.

A 90 percent habitat retention target was applied to all habitat in the South Central Coast and to the Class 1 habitat in the Central and North Coast since both orders include flexibility provisions that allow limited harvesting in these areas if the harvesting is confirmed to not cause a material adverse impact to the habitat and other conditions are met. In written comments dated May 6, 2009, Interfor suggested that the constraint applied in the base case to address Objective 17 was too constraining as both orders include flexibility provisions and since the habitat polygons in

Schedule 2 represent buffered features, many of which are not put at risk by timber harvesting activities. Interfor requested that the timber supply analysis report include a sensitivity forecast that examined the consequence of not specifically reserving the grizzly bear habitat listed in the orders. The requested sensitivity forecast was generated and it had harvest levels that were two percent higher than the base case.

There is a degree of uncertainty whether, or to what extent, harvesting activity will occur within the grizzly habitat areas set out in Objective 17. I request that district staff monitor this activity so that improved information can be incorporated in the next AAC determination, and I have included an instruction to that effect in '**Implementation**' below.

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

Other information

- *Ecosystem Based Management*

The modelling of specific EBM objectives in the 2010 timber supply analysis is discussed in earlier sections of this rationale document. I note that the timber supply analysis report included sensitivity forecasts that examined the timber supply implications of the EBM objectives and the new conservancies and BMTAs for the Mid Coast TSA. A forecast that did not apply the EBM objectives, but reserved the conservancy areas and BMTAs, had short-, mid- and long-term harvest levels that were 5 percent, 13 percent and 13 percent higher than in the base case forecast, respectively. A separate forecast that did not apply the EBM objectives and did not reserve the newly established conservancy areas and BMTAs from harvesting had short-, mid- and long-term harvest levels that were 28 percent, 41 percent and 52 percent higher than in the base case forecast, respectively.

In a letter dated May 21, 2010, the Gwa'sala-'Nakwaxda'xw Nation submitted that they were very disappointed with the negative impacts of the adoption of EBM, i.e. the reduction of the available timber supply, the isolation of merchantable timber and the general increase in operating costs. Combined, these further limit the opportunities available to them to secure meaningful, long-term employment for its members in the forest harvesting sector or to successfully enter the timber harvesting business itself in spite of First Nations forest tenures being made available.

The Heiltsuk First Nation, in a letter dated June 18, 2010, commented that the base case level was too high and questioned the analysis results which indicated the short-term harvest level could remain close to the current AAC even with the implementation of EBM.

In letters dated June 22, 2010, and June 25, 2010, Interfor refers to the timber supply forecasts described above which quantify the timber supply impacts attributable to the Coast Land Use Decision. They submitted that impacts in the plan area are approaching the level expected when EBM is fully implemented and draw my attention to statements in the preamble to the legal orders that speak to the intent of finding a balance between high levels of old-forest representation and employment levels in the implementation of EBM.

In response, I note that the South Central Coast Ministerial Order, the Central and North Coast Ministerial Order represent government's current intent for implementing EBM in the plan area and I must account for them in my determination. Although the preamble to each order, which

are not part of the orders, suggest government will monitor EBM implementation and, if necessary, amend the orders to better achieve the two overarching goals for ecosystem integrity and human wellbeing, no amendments have been made. As stated in my guiding principles, I do not speculate on timber supply impacts that may result from land-use decisions not yet finalized by government. Therefore, my focus is on the intent of the current legal orders. From my review of the procedures applied in the timber supply analysis, with the qualifications addressed in specific sections in this document, I am satisfied that the base case applied the best available information to project current management under the land-use orders.

- *actual harvest performance*

Harvest performance information for the Mid Coast TSA indicates that the four major licensees and BC Timber Sales harvested 63 percent of their apportioned AAC in the TSA during the period 2000 to 2009, and that the annual harvest in each of the last three years has been much lower than the AAC.

Substantial undercut has accumulated in the TSA. MNRO staff reported that for the period before 2007 the undercut was 789 000 cubic metres, of which 395 000 cubic metres was issued as non-renewable tenures. The remainder of this volume was reconciled and will not be issued under new tenures. Staff estimated that the undercut volume that has accrued between 2007 and 2009 was slightly less than 1.5 million cubic metres. As in other TSAs with large accumulated undercut volume, care must be taken to ensure that these timber volumes are not performing 'double-duty', that is, that they are not assumed from inventory information to be available to support the timber supply as currently projected in the base case forecast when in fact they may already have been identified by another statutory decision maker as available for harvest.

Interfor in a letter dated June 25, 2010, expressed concern about my use of historic performance levels as a benchmark for setting the AAC. They note that that the performance levels are not uniform between years or between licensees and cite, as an example, the harvest in 2005 which was above the AAC and that total harvest from Interfor's forest licences was 109 percent of their apportioned AAC for that year.

In response, it is generally not my practice to use past performance as a benchmark for my determinations. Rather, I consider performance information, including trends, compiled for several years as a general indication of how well licensees, and BCTS, are collectively able to make use of the AAC available to them. In some cases, I may find this information to be relevant when I consider the uncertainty that exists around various determination factors, such as economic operability. For the Mid Coast TSA, I note that total annual harvest has varied greatly from year to year and that the proportion of AAC harvested has also varied greatly among licensees. The lowest performance levels have been in recent years and I recognize that broader economic issues have had a significant influence on activity in these years. I also recognize that recent years have been a period when licensees are striving to gain expertise in meeting the challenges of implementing EBM more efficiently. I expect that as licensees accumulate experience in implementing EBM and demonstrate capability to harvest more areas with high costs or lower timber values harvest performance, relative to the AAC, will improve in the TSA. If however the annual harvest continues to be below the AAC in future years, with no prospect of improvement, some adjustment to THLB assumptions may be required.

- *harvest performance in AAC partitions*

In his June 2000 AAC Determination for the Mid Coast TSA, Chief Forester Larry Pedersen specified an AAC partition of 200 000 cubic metres per year (20 percent of the AAC) for poor or low site hemlock- and balsam-leading stands. He also stated an expectation that at least 59 000 cubic metres per year (5.9 percent of the AAC) should come from stands in the outer coast and 178 000 cubic metres per year (17.8 percent of the AAC) should come from stands outside the conventional operability lines. He requested that the performance in these three forest types be monitored so that it could be evaluated at the next AAC determination.

Using harvest summary information reported by licensees, district staff reported that in the period 2000 to 2009, inclusive, the volume of timber harvested from poor/low site hemlock- and balsam-leading stands was 19 percent of the total volume. In the same period, the volume of timber harvested from stands on the outer coast of the TSA and from stands outside the conventional operability made up 8 percent and 37 percent of the total volume harvested, respectively. In summary, for the 10 year period stated above, the percentage of harvest from low and poor site stands was roughly met expectations, the percentage of harvest from outer coast stands was above expectations and the percentage of harvest from outside the conventional operability lines was greatly above expectations. However, I also note that for the 10-year period, the total volume harvested in the TSA was only 63 percent of the available AAC.

The base case forecast allowed up to 20 percent of the total harvest in each period to come from stands in the outer coast, which is considerably higher than the partition applied by the chief forester in 2000 and higher than the 10-year average harvest reported for these stands. The licensee group applied the 20 percent limit for two reasons. The THLB in outer coast stands is represents about 20 percent of the TSA total and the proportion of harvest that was taken from the outer coast in the last three years (2007-2009) was 24 percent of the total. The analysis report presented a sensitivity analysis that examined the consequence of limiting the outer coast harvest contribution to 10 percent. In this forecast, the initial and long-term harvest levels were six percent and three percent lower than projected in the base case.

In their submission on June 18, 2010, the Heiltsuk First Nation recommended that I abandon the base case scenario and adopt elements of the outer coast sensitivity forecasts which would better meet Heiltsuk interests.

Regarding harvest levels in the outer coast, staff have advised me that recent market conditions have generally favoured the timber profiles and conditions in the outer coast, which I note is evident in the three-year harvest performance figures stated above. For this reason, and since outer coast stands represent almost 20 percent of the THLB, I am confident that the base case forecast has not significantly overestimated the proportion of total harvest that could be achieved from this area in the future. However, I acknowledge that there is a degree of uncertainty about this assumption and I will request that district staff continue to monitor performance in the outer coast as noted in '**Implementation**', below.

- *First Nations consultation process*

The Crown maintains a duty to consult with, and accommodate if necessary, those First Nations for whom it has knowledge of the potential existence of aboriginal interests that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations. As chief forester, I must therefore consider information arising from the

consultation process with First Nations respecting aboriginal interests and treaty rights that may be affected by my AAC determination. As well, I will consider relevant internal information available to the ministry regarding aboriginal interests.

Seven First Nations have asserted traditional territories that overlap with the Mid Coast TSA, these include: the Gwa'sala-'Nakwaxda'xw Nation, Heiltsuk First Nation, Kitasoo-Xai'xais First Nation, Nuxalk Nation, Tsilhqot'in Nation, Ulkatcho First Nation and Wuikinuxv Nation. Ministry of Natural Resource Operations staff have engaged in consultation with each of these First Nations to the best of their ability and in accordance with government direction (Ministry of Forests Aboriginal Rights and Title Policy and the Ministry of Forests Consultation Guidelines (2003)), the principles set out in the relevant case law and the Tsilhqot'in Framework Agreement.

The traditional territory of four additional First Nations overlap small areas of the Mid Coast TSA in land located outside the timber harvesting land base. These four First Nations are the Da'naxda'xw-Awaetlala First Nation, Tsawataineuk (now Dzawada'enuxw) First Nation, Kwicksutaineuk-Ah'Kwaw'Ah'Mish First Nation and the Campbell River First Nation. Ministry of Natural Resource Operations staff advised me that my AAC determination for the Mid Coast TSA has a low potential of adversely impacting the aboriginal interests of these First Nations. Each were provided the option of further participation in the timber supply review process if requested, however no interest was brought forward, and therefore further engagement was not undertaken with these First Nations.

Consultation on the timber supply review was initiated in June 2008 when MFR (now MNRO) sent letters to each of the First Nations that have a large asserted traditional territory within the Mid Coast TSA notifying them that the TSR process was beginning and encouraging them to participate in the process. In order to incorporate a First Nations point of view during the development of modelling assumptions, the licensee group invited First Nations to participate in the technical meetings leading up to the completion of the draft data package. As a result, forestry representatives of the Heiltsuk, Wuikinuxv, Gwa'sala-'Nakwaxda'xw and Kitasoo-Xai'xais First Nations participated in the technical meetings of the licensee group.

Consultation on the Information Package was initiated on March 6, 2009, when MFR (now MNRO) sent each First Nation a letter that invited comments on the Draft Data Package and requested information related to aboriginal interests that may be impacted by an AAC determination. Formal comments were requested by the end of the 60-day review period which was from March 13, 2009 to May 15, 2009. First Nations were also invited to an information sharing meeting held in Port McNeill on March 13, 2009, which was attended by the Wuikinuxv Nation and Kitasoo-Xai'xais First Nation. Individual information-sharing meetings were held with the Heiltsuk First Nation and the Nuxalk Nation on April 28, 2009 in Bella Coola.

Prior to commencing consultation on the Draft Timber Supply Analysis Report, MNRO staff undertook a review of available information to assess the nature of known aboriginal interests of each First Nations in order to understand how the proposed AAC determination would impact those interests, as well as to identify potential measures to address any such impacts. Based upon this information review, MNRO proposed that consultation be undertake at the *normal* level for the Gwa'sala-'Nakwaxda'xw Nation, Heiltsuk First Nation, Kitasoo-Xai'xais First Nation, Nuxalk Nation, Ulkatcho First Nation and Wuikinuxv Nation. A lower level of consultation was proposed for the Tsilhqot'in Nation since its asserted traditional territory

overlapped only a small portion of the Mid Coast TSA, much of which was located outside of the THLB. No response was received from the Tsilhqot'in Nation and consultation continued at the lower level. As a result of the implementation of the *Tsilhqot'in Framework Agreement* early in 2010, it was determined that no further engagement was required with the Tsilhqot'in Nation in regard to the Mid Coast Timber Supply Review.

On March 30, 2010, the MFR (now MNRO) sent a letter to each of the six above listed First Nations initiating consultation on the Draft Timber Supply Analysis Report. The letter shared the results of the information review, proposed a level of consultation and invited the First Nation to provide additional information regarding their specific aboriginal interest in the Mid Coast TSA and how that interests may be impacted by the proposed AAC determination. Formal comments on the Draft Timber Supply Analysis Report were requested before the end of the 60-day review and comment period, which was from March 30, 2010 to May 31, 2010, and follow-up requests for comments were sent on May 11, 2010. Individual information-sharing meetings were held with the Nuxalk Nation on March 18, 2010, the Heiltsuk First Nation on April 7, 2010, the Kitasoo-Xai'xais First Nation on April 7, 2010, the Wuikinuxv Nation on April 22, 2010, and the Ulkatcho First Nation on May 25, 2010. Information on the Draft Timber Supply Analysis Report was shared with the forestry advisor for the Gwa'sala-'Nakwaxda'xw Nation held March 5, 2010, in Port McNeill.

From my review of the consultation summary, I conclude that reasonable efforts were made by the North Island-Central Coast Resource District to inform First Nations about the timber supply review and engage them in consultation regarding their aboriginal interests and how these interests may be affected by this AAC determination. MNRO staff undertook a review of available information of aboriginal interests in the TSA and an assessment of potential impacts my AAC determination may have on those interests. Although the specifics of the information review were not formally shared with First Nations at the beginning of the timber supply review process, the findings from the review and proposed level of consultation were shared in subsequent consultation letters and a preliminary assessment was completed. Based on this, I agree with district staff that the level of consultation was appropriate and that First Nations were provided adequate opportunities to share their concerns related to specific aboriginal interests that may be impacted by this decision.

I have also reviewed the summary of information received through the First Nations consultation process. Written correspondence was received from the Heiltsuk First Nation regarding the Draft Data Package and Draft Analysis Package, and the Gwa'sala-'Nakwaxda'xw Nation and Ulkatcho First Nation regarding the Draft Analysis Report, all of which have been responded to appropriately. I note also that, verbal comments were received from First Nations representatives during information sharing meetings, which were recorded in the *Mid Coast Timber Supply Review III – First Nation and Public Review and Comment Summary for the Analysis Report* dated May 24, 2010. Many of these were technical in nature and were addressed by MNRO staff or licensee group representatives during those meetings. In this rationale, I have included specific suggestions and comments that have been influential in my considerations for this determination in the appropriate sections throughout this rationale with a response indicating how I have addressed the issues raised.

My responses to other comments that were not specifically addressed in other sections of this rationale are as follows.

Questions were raised as to whether certain meetings constituted information-sharing or consultation. In the most cooperative spirit I would suggest that information sharing by all sides is in itself an essential component of a successful consultation process. On the MNRO's part, the publication and further explanation of the data package and analysis, directly or with assistance through approved delegation, are intended as aids to that end. The confidentiality of the information provided by First Nations for analytical purposes becomes an essential part of the process when requested.

The Gwa'sala-'Nakwaxda'xw Nation indicated that all current and proposed forest development, harvesting, marine log handling and postharvest activities carry a high risk of infringing their aboriginal title, rights and interests. Further, they are concerned about the impact which construction, logging, log handling and post-harvest treatments could have on marine resources, upland terrestrial and aquatic resources, cultural heritage resources and archaeological sites in the area.

The Heiltsuk First Nation believe the AAC determination for the Mid Coast TSA affects their aboriginal rights including title and their right to determine how land is used in their traditional territory. They indicated from past experience that strategic level planning to set the AAC, and allocations that result following the determination, will impact on rights throughout their territory. They also advised that they have used the area encompassed by the Mid Coast TSA in the past and continue to use the area for cultural, ecological, social, economic and other purposes.

In response to these comments by the Gwa'sala-'Nakwaxda'xw Nation and Heiltsuk First Nation, I note that my AAC determination will not change management practices, and consideration of aboriginal interests at the operational level will continue. Ministry of Natural Resources Operations staff indicated to me that the proposed AAC determination is unlikely to have an adverse effect on the ability of First Nations to exercise their aboriginal interests in the area, especially given the amount of land base that is protected from commercial forestry development through the Central Coast Land Use Decision. Concerning the potential impacts that forestry operations may have on aboriginal interests I note that the MNRO will continue to consult with each First Nation on upcoming administrative and operational decisions.

The Heiltsuk First Nation advised that in accordance with the *Reconciliation Protocol Agreement* (RPA) established in December 2009, consultation on strategic level planning initiatives including timber supply reviews requires the highest level of consultation as stated in the RPA. This is because the decision has significant potential for infringement of aboriginal rights, title and interests; and the decision affects more than one First Nation. These types of decisions should be discussed through the Government to Government Forum Working Group associated with the RPA. They requested that I defer the AAC decision until it can be discussed via Government to Government Forum Working Group.

In response, I note that consultation on the AAC determination was guided by the *Heiltsuk Forestry Agreement* which, despite its expiration on March 31, 2010, was in effect when the TSR process began for the Mid Coast TSA in June 2008. MFR (now MNRO) staff advised me that based upon the findings of the initial information review and confirmed through the preliminary assessment, the level of consultation with the Heiltsuk First Nation was sufficient and appropriate.

My expectation is that consultation efforts on future AAC determinations within their traditional territory will be guided by the Engagement Framework currently being developed as part of the RPA.

The Heiltsuk First Nation recommended that MNRO reflect duality of ownership of lands in the TSA, for example, by changing references such as 'productive forest under Crown ownership' to acknowledge duality of title.

I note that, in the Coastal First Nations Reconciliation Protocol, the Province acknowledges that the Heiltsuk First Nation has aboriginal title, rights and interests within their traditional territory and that the RPA is a step to future reconciliation of that title, rights and interests with provincial title, rights and interests.

The Heiltsuk First Nation notes that climate change factors were not incorporated into the model for the timber supply analysis. Heiltsuk First Nation would like more information on how MNRO is addressing climate change in forest management. They indicate that they would like to work with the chief forester to identify ways to consider climate change in the AAC determination and to implement strategies to mitigate impacts.

In response, I note there is strong scientific evidence that climate change will significantly affect our forests and rangelands, however, there is considerable uncertainty about the magnitude and timing of this change and about impacts on forest ecosystems in the future. Responding to climate change is one of government's key priorities. Government is developing strategies for forest carbon and bioenergy, initiating a future forest strategy with forest companies, and supporting other federal and provincial climate change initiatives. Government initiated the Future Forest Ecosystems Initiative in 2005 to start the process of adapting BC's forest and range management framework to a changing climate. I anticipate that information we are currently collecting on the potential implications of climate change and the range of response available to manage for these changes will be incorporated into future timber supply reviews. I appreciate the offer by the Heiltsuk First Nation to help the MFML in these undertakings.

The Heiltsuk First Nation recommended that in the spirit of the RPA, and the understanding that provincial ministries and departments are working towards integration to implement the Engagement Framework, that communications occur within MNRO to ensure those involved with allocation understand that policies need to focus on providing more local benefits in terms of jobs and revenue, and requested that their recommendations be revisited when full collaborative management and revenue sharing occurs.

In response to this comment, I note that MNRO staff are working diligently with the Coastal First Nations and other government agencies through the governance framework defined in the RPA, to support the effective and efficient implementation of the RPA and its associated schedules including those related to economic opportunities and strategies.

Some member nations of the Coastal First Nations (CFN) group are parties to the Coastal First Nations/British Columbia Reconciliation Protocol. The Reconciliation Protocol commits the signatories to "developing environmentally credible and marketable forest carbon offsets." Currently, no carbon offset projects have been approved for the Coastal Land Use Decision area. CFN has expressed concern that my AAC determination may hinder the ability of First Nations to develop carbon offsets projects. I must emphasize that decisions on approval of carbon offsets projects and the development of protocols for measurement of such offsets are outside my

responsibility and are being addressed through processes led by the Ministry of Environment. I provide the following information in hopes that it will supply some contextual clarity for the discussions pursuant to the Reconciliation Protocol with respect to carbon offsets projects. As noted elsewhere in this rationale, my determination accounts fully for approved components of the Coastal Land Use Decision, including the objectives in South Central Coast and Central and North Coast Ministerial Orders. In addition to the land-use decision, my determination accounts for other types of new information and knowledge. Specifically, as discussed elsewhere in the rationale, this determination accounts for new information on economic operability, on site productivity, and on the growth and yield impacts of select seed. These considerations to some extent offset the impacts of the land-use decision. Since they represent the best available information, they would have been considered in the AAC determination even if the land-use decision had not been made. The timber supply analysis report includes a sensitivity analysis that suggests the land-use decision reduces the short-term timber supply for the Mid Coast TSA by 28 percent relative to a pre-land use decision regime and reduces the long-term timber supply by 52 percent relative to a pre-land use decision regime. I note that the short-term impact is very similar to an estimate derived during the Detailed Strategic Planning that was conducted during development of the land-use decision. The comparison of results of the licensee analysis with the DSP analysis provides comfort that the elements of the land-use decision have been incorporated appropriately. Finally, I am aware that analysis undertaken in support of the CFN/BC Reconciliation Protocol has indicated that implementation of the land-use decision would increase the amount of carbon stored in forest ecosystems in the plan area. For this determination, these considerations do not affect my AAC decision.

From all of the foregoing in this section, I believe that the MNRO has engaged in consultation at an appropriate level with affected First Nations, and that this consultation has been meaningful and adequate for the circumstances. I would like to thank the First Nations for a productive and mutually respectful exchange of information and ideas during this consultation process, and I reiterate that most of my considerations regarding specific aboriginal interests relevant to my decision are discussed throughout this document in sections under the appropriate headings.

If new information regarding First Nations' aboriginal interests becomes available that significantly varies from the information that was available for this determination, I am prepared to revisit this determination sooner than 10 years.

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

- *alternative harvest flows*

The base case forecast incorporated a harvest flow designed to achieve an acceptable short-term harvest level consistent with other objectives for providing a managed, gradual transition from the short-term to the mid- and stable long-term levels, avoiding large, abrupt disruptions in timber supply, as briefly described in '*base case for the Mid Coast TSA*' and detailed in the 2010 timber supply analysis report. Several alternative harvest flow forecasts were undertaken and are described in the analysis report, each of which was evaluated before establishing the base case.

I have reviewed all of the alternative harvest flow projections included in the analysis report, and for the valid reasons outlined in the report, I agree that the 'alternative harvest flow patterns do

not provide significant benefit in the mid- or long-term, and in fact do not fully capture the productive capacity of the land base'.

A June 18, 2010, letter from the Heiltsuk First Nation submitted that the contemplated AAC in the base case scenario was too high. They advised that a timber supply forecast that incorporated the elements of two sensitivity forecasts that, respectively, managed the cedar harvest profile and limited the contribution from the outer coast would better meet Heiltsuk interests, as future options are maintained. As noted in '*harvest profile'* and "*actual harvest performance'* I have carefully examined the relative merits of these two sensitivity forecasts and concluded that they are not a more accurate representation of current practices in the Mid Coast TSA.

To conclude, all of the analyses presented in the timber supply analysis report have been helpful in identifying the advantages and shortcomings of various harvest flows and, with the qualifications addressed in specific sections in this document, I am satisfied that the base case projection represents the most advantageous progression of harvest levels achievable in the Mid Coast TSA at this time.

- *community dependence on harvest level*

The population for the Central Coast Regional District (CCRD), which is the approximate area of the Mid Coast TSA, is less than 3,500 persons and is currently decreasing. The largest communities are Bella Coola and Waglisla (Bella Bella) on Campbell Island. About one-half of the people in the Mid Coast TSA live in the Bella Coola Valley, including Hagensborg and Firvale and about one-quarter live in Waglisla. The rest of the residents live in small communities along the outer coast, such as Ocean Falls, Shearwater, Klemtu, Oweekeno, Dawsons Landing and Namu.

A number of recently completed assessments and surveys provide information on the degree to which these communities, and the province as whole, depend on the harvest levels within the TSA. These reports include the following: *BC Central Coast and North Coast Timber Harvesting & Processing Employment Survey* (Pierce Lefebvre Consulting, 2006); *Economic Dependency Tables for Forest Districts: 2006* (Horne 2009a) and *BC Local Area Economic Dependencies: 2006* (Horne 2009b).

The 2006 census indicated that forestry accounted for 24 percent of the basic employment in the North Island-Central Coast Resource District. However, the level of dependency on forestry employment is distinctly lower in the CCRD compared to the entire district. Only about 11 percent of forestry workers associated with harvesting in the Mid Coast TSA (and local area) actually reside within the TSA, most reside on Vancouver Island, the lower mainland or elsewhere in BC.

BC Stats information (Horne, 2009b) indicated that in the period between 1996 and 2006, forest sector dependence in the CCRD decreased from 26 percent to 4 percent. The most likely cause is the decrease in timber harvesting in the TSA and surrounding forest management units since a lot of the local forestry employment involves harvesting, silviculture and supporting activities. The average annual harvest in the Mid Coast TSA for the period from 2000 to 2003 was 603 000 cubic metres, while the average harvest for the period from 2006 to 2009 was lower at 388 000 cubic metres. During the entire period from 2000 to 2009 the average annual harvest was 530 000 cubic metres or 63 percent of the available AAC in that period.

Pierce Lefebvre Consulting (2006) indicated that that harvesting and silviculture and primary wood processing activity in the TSA generates an average of 1.19 person-years of direct employment per 1000 cubic metres of timber harvested, for the province. Direct employment from harvesting and silviculture also generates indirect and induced employment. Information from previous assessments indicated that each forestry job in the TSA generates about 1.2 indirect and induced jobs in the province (Robinson Consulting Ltd, 2009).

Applying the provincial coefficients and multipliers to the changing harvest levels provides an indication of the magnitude of decline in the employment generated by timber harvesting in the TSA since 2000. For example, if fully harvested, the TSR 2 AAC of 998 000 cubic metres could support 2,625 person-years of direct and indirect employment in the province. In comparison, if fully harvested the current initial base case level of 767 000 cubic metres could support 2,017 person-years of direct and indirect employment within the province. The difference in forestry employment estimated between the TSR 2 AAC level and the current base case level is 608 person-years, which is a 23-percent reduction. This is the loss in employment that would have occurred if the AAC was achieved. However, as I note in 'actual harvest performance', harvest levels in the TSA have generally been below the AAC so the actual reduction in forestry employment that has likely occurred since the previous AAC determination is probably greater. I am also mindful that historic harvest performance has varied between licensees and therefore, employment trends will have also varied between licensees.

Interfor's May 18, 2010, submission on *Mid Coast TSA Economic Dependencies* suggested that the interconnected nature of the economic dependencies is difficult to capture with employment coefficients. They reported employment coefficients for their forestry operations that increased as harvest levels declined between 2005 and 2009. In response, I note that an increase in employment coefficients with the lower harvest levels is expected, particularly in the short term. I also note that these coefficients are useful in providing a long-term perspective on forestry employment levels in the area and its relative importance to the overall local economy.

The Gwa'sala-'Nakwaxda'xw Nation, the Heiltsuk First Nation, Nuxalk Nation and Interfor all expressed disappointment that there was insufficient funding to conduct a new socio-economic analysis within the TSR process. In response, I note that information compiled in the various existing socio-economic studies and the BC Stats reports listed above, as well as the report on *Mid Coast TSA Economic Dependencies* submitted by Interfor, collectively, provide a sufficient indication on the dependence of local communities and the province on harvest levels in the Mid Coast TSA for the purpose of my determination.

In my determination I have considered the need and the potential for the forest sector to continue to contribute to the well-being of people in the area and throughout the province.

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for BC;

<u>Economic and Social Objectives</u>

- *Minister's letter*

The Minister of Forests and Range (which is now the Ministry of Forests, Mines and Lands) has expressed the economic and social objectives of the Crown for the province in a letter to the chief forester, dated July 4, 2006, attached here as Appendix 3.

The letter stresses the importance of a stable supply of timber to maintain a competitive and sustainable forest industry while being mindful of other forest values. In respect of this, in the base case projection and in all of the alternative harvest flow projections with which I have been provided for reference in this determination, a primary objective in the harvest flow has been to attain a stable, long-term harvest level where the growing stock becomes stable, neither increasing nor decreasing over time. Consequently, in my determination I have remained mindful of the need for the allowable harvest in the immediate term to remain consistent with maintaining the integrity of the timber supply projection throughout the planning horizon.

I have also considered with care the adequacy of the provisions, both as made in current practice and as assumed in the analyses, for maintaining a range of forest values. From applying careful attention to all of these considerations throughout, I am satisfied that my determination is in accordance with the objectives of government as expressed by the Minister.

- *local objectives*

The Minister's letter of July 4, 2006 suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the TSR where these are consistent with government's broader objectives. To this end, and to ensure appropriate opportunities both for public input and for consultation with First Nations, in addition to the specific elements of the formal First Nations consultation process described separately under '*First Nations consultation process*', public input was invited on the data package from March 13, 2009 to May 15, 2009, with advertising notices placed in local newspapers, letters sent to all available First Nations and public stakeholders, and where possible additional e-mail notices sent to groups with likely interest. A website was also made available. Feedback from this process resulted in several changes to the data package.

The analysis report was similarly advertised and public input was invited from March 30, 2010 to May 31, 2010. Public input from these processes is noted and addressed in various sections throughout this rationale, and in my considerations and reasoning in this determination I have remained mindful of this input and of the need to balance and integrate social and economic as well as biophysical considerations, in consistency with the Minister's recommendation. I thank all those persons who have taken the time and trouble to provide me with their ideas and information.

Reasons for Decision

In reaching my AAC determination for the Mid Coast TSA, I have made the considerations documented above, all of which are integral to the reasons for my decision, and from which I have reasoned further as follows.

The current AAC for the Mid Coast TSA, determined under Section 8 of the *Forest Act* effective June 1, 2000, is 998 000 cubic metres including a partition of 200 000 cubic metres attributable to hemlock-balsam stands on sites of poor and low productivity. During most of the time since 2002, the AAC for the Mid Coast TSA was reduced under Section 173, Part 13 of the *Forest Act* to account for designated areas. The most recent reduction, which was for the period between September 28, 2006, and May 23, 2010, reduced the AAC to 768 000 cubic metres.

The March 2010 base case forecast projected an initial harvest level of 767 000 cubic metres per year, 23 percent less than the 2000 AAC and 1000 cubic metres less than the Part 13-reduced

AAC, with a subsequent progression of harvest levels as noted in '*Base case for the Mid Coast TSA*'.

In determining AACs, my considerations typically identify factors that, considered separately, indicate reasons why the timber supply may be either overestimated or underestimated in the harvest levels projected for various periods in the base case. Some of these factors can be quantified and their implications assessed with reliability. Others may influence the assessment of the timber supply by introducing an element of risk or uncertainty, but cannot be quantified reliably at the time of the determination and must be accounted for in more general terms.

In my considerations for the Mid Coast TSA I have identified the following reasons why the timber supply may have been overestimated in the 2010 base case forecast:

- *economic operability:* overestimation in the economically operable land base assessed for the Owikeno Lake basin means that the timber supply projected in the base case is overestimated in the short term by about 8000 cubic metres per year, or about one percent.
- *wildlife habitat areas:* continued implementation of the IWMS, including the establishment of wildlife habitat areas and application of general wildlife measures, likely result in a one-percent – about 8000 cubic metres per year – decrease in the short-term timber supply.
- *EBM objectives for red- and blue-listed plant communities*: the need to adjust the non-spatial timber harvesting land base reduction applied for blue-listed plant communities means that the base case short-term timber supply is overestimated by about 6000 cubic metres per year, or about 0.8 percent.
- *volume estimates for managed stands, and operational adjustment factors*: managed stand yield estimates did not account for the productivity effect of group-retention in areas managed with clearcut with reserves, resulting in an unquantified overestimation in the base case mid- to long-term harvest levels.

In my considerations I have identified the following reasons why the timber supply may have been underestimated in the 2010 Mid Coast TSA base case projection:

- *previously harvested stands*: the need to account for a portion of previously harvested stands that were incorrectly excluded from the timber harvesting land base as inoperable results in a 17 000 cubic metres per year, or 2.2 percent, underestimation in the short-term timber supply.
- *volume estimates for existing natural stands*: natural stand volumes compiled using VDYP7, the current MFML yield model, are in total 5.5 percent higher than the volumes assumed in the base case, resulting in about a 24 500 cubic metres per year – or about 3.6 percent – underestimation of the mid-term timber supply.

From reviewing all of the above-listed indications of over- and underestimation in the projected timber supply, I have reasoned as follows. The unquantified overestimation in the mid-term and long-term harvest levels due to overestimation of managed stand yields does not influence my determination as managed stands are not projected to be harvested for several decades, well after the expected date of the next determination. Therefore, this issue can be resolved during the next timber supply by using the then current yield model for the analysis.

The overestimations in the short-term harvest level that can be reasonably quantified total about 22 000 cubic metres per year. The underestimations in the short term that can be reasonably

quantified total about 17 000 cubic metres per year. The net result of these over- and underestimations indicates a potential overestimation of approximately 5000 cubic metres per year – or less than one percent – in the initial harvest level projected in the base case. However, since most of the figures considered in the derivation of this net adjustment are subject to varying degrees of approximation and uncertainty, and the small magnitude of the adjustment, I have decided not to alter the base case initial harvest level on this account.

Based on the base case projection and my considerations described above, I have determined that the new AAC should be 767 000 cubic metres which is 231 000 cubic metres, or roughly 23 percent, below the current AAC. Taken at face value, this is a substantial reduction that exceeds the 10-percent-per decade objective used as socio-economic guidance in modelling declining harvest levels. However, I am mindful that most of this reduction is attributable to the establishment of Probationary Community Forest Agreements and the creation of conservancies and BMTAs that the Minster of Forests and Range (which is now the Ministry of Forests, Mines and Lands) considered in making his apportionment decisions for the Mid Coast TSA made on December 3, 2005 and May 3, 2010. I am also mindful that for most of the time since 2002 the AAC for the Mid Coast TSA has been reduced under Section 173 of the *Forest Act* to a level under 800 000 cubic metres; which suggests that, to some extent, local communities and forest licensees have already adjusted to an AAC at about the level of the initial harvest level projected in the base case.

Finally, I have also considered the economic and social objectives of the Crown as expressed by the Minister of Forests and Range in his letter dated July 4, 2006, that asked me to consider the nature of the timber supply that can contribute to a sustainable forest industry, while reflecting decisions made in land and resource management plans. From all of the foregoing, it is my judgement that an AAC at 767 000 cubic metres accounts for the clearly needed decrease in harvesting related to a reduced timber harvesting land base. I also expect that as licensees gain operational experience implementing EBM requirements, better information about the timber supply implications of EBM will be obtained. In the event that important new information becomes available that significantly varies from the information that was available for this determination, I am prepared to revisit this determination sooner than 10 years from now.

An additional issue influencing my determination of the AAC for the Mid Coast TSA is the immediate challenge of timber harvesting operations in the Owikeno Lake basin. In the base case, stands within the Owikeno Lake basin are projected to contribute more than 10 percent of the total TSA timber supply. However, recent performance in this area is well below this level. My concern, which was demonstrated by sensitivity analysis, is that harvesting the entire AAC without sufficient contribution from stands within the Owikeno Lake basin would jeopardize the sustainability of the timber supply in the areas outside of the Owikeno Lake basin. Therefore, as discussed in '*Partitioned component of the harvest'*, I have decided to establish a partition in the AAC of 691 000 cubic metres, i.e., about 90 percent of the total AAC, as harvestable from watersheds outside the Owikeno Lake basin.

The boundary of the Owikeno Lake basin, for the purpose of the AAC partition, and the process for administering the partition will be determined by the North Island-Central Coast Resource District Manager.

The AAC I have determined is dependent and conditional upon the ongoing maintenance of harvest contributions of at least 20 percent of the AAC volume from hemlock-balsam stands of

poor and low site productivity, at least 15 percent of the AAC volume from stands in the outer coast area and the contribution from non-cedar species that is generally consistent with the '*Base case for the Mid Coast TSA*'. I expect district staff to closely monitor and ensure the appropriate levels of harvesting in each of these categories, including the partition, and to provide this information at the next AAC determination so that, if necessary, the contributing land base can be adjusted accordingly.

Determination

Having considered and reasoned from all of the factors as documented above, including evaluating the risks and uncertainties in the information provided, it is my determination for the Mid Coast TSA that a timber harvest level that accommodates as far as possible the objectives for all forest resources under the areas subject respectively to the Coast Land Use Decision, that reflects current management practices as well as the socio-economic objectives of the Crown as expressed by the Minister of Forests and Range , (which is now the Ministry of Forests, Mines and Lands) that accounts for First Nations' expressed interests in forest lands, and that represents an essential step in a manageable transition toward the mid-term levels forecast for the TSA, can be best achieved at this time by establishing an AAC of 767 000 cubic metres, of which 691 000 cubic metres are harvestable within the watersheds that are outside the Owikeno Lake basin. This new AAC excludes all volumes in issued woodlot licences, and community forest agreements and will remain in effect until the next AAC is determined.

The new AAC will take effect February 17, 2011.

Implementation

In the period following this decision and leading to the subsequent determination, I encourage MNRO staff and licensees to undertake the tasks and studies noted below, the particular benefits of which are described in appropriate sections of this rationale document. I recognize that the ability of staff and licensees to undertake these projects is dependent on the available resources, including funding. These projects are; however, important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Mid Coast TSA.

1. District staff should monitor harvest performance in the AAC partition I specified in my '**Determination**' as well as harvest performance in hemlock-balsam stands, stands of poor- and low-site productivity and stands in the outer coast portion of the TSA.
2. District staff should monitor the level of cedar harvest and the level of cedar regeneration in the TSA.
3. District staff should monitor the types of silvicultural systems applied in the TSA and ensure that information in the Reporting Silviculture Updates and Land Status Tracking System (RESULTS) accurately reflects the level and distribution of tree retention in harvested areas.
4. Licensees and district staff should work cooperatively to resolve the uncertainty regarding the growth and yield implications associated with high levels of group retention.
5. Licensees and district staff should work cooperatively to improve information on the nature and extent of management practices to protect high value fish habitat.
6. District staff should monitor where and how ungulate winter range habitat is maintained in the TSA to achieve government objectives for ungulate winter range habitat.

7. District staff should monitor where and how much harvesting activity occurs within the grizzly habitat areas set out in Objective 17 of the South Central Coast and Central and North Coast Ministerial Orders.
8. District staff should work with local First Nations to collect locally applicable information about the management practices undertaken to maintain forest resources and features used by First Nations in the Mid Coast TSA.

Jim Snetsinger, RPF
Chief Forester

February 17, 2011

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, Consolidated to December 30, 2009, reads as follows:

Allowable annual cut

8 (1) The chief forester must determine an allowable annual cut at least once every 10 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 agreement 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 a result set out under section 39 (2) or (3),

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 10 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 10 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 10 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

(a) by written order may postpone the next determination under subsection (1) to a date that is up to 15 years after the date of the relevant last determination, and

(b) must give written reasons for the postponement.

(3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she

(a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and

(b) must give written reasons for setting the earlier date.

(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,

(a.1) different areas 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 an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine an allowable annual cut for each community forest agreement area, 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) [Repealed 2003-31-2.]

(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.

Appendix 2: Section 4 of the *Ministry of Forests and Range Act*

Section 4 of the *Ministry of Forests and Range Act* (consolidated to March 30, 2006) reads as follows:

Purposes and functions of ministry

4 The purposes and functions of the ministry are, under the direction of the minister, to do the following:

(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
    i. timber processing industry, and
    ii. ranching sector
in British Columbia;
(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Appendix 3: Minister's letter of July 4, 2006

BRITISH COLUMBIA

JUL 0 4 2006

Jim Snetsinger
Chief Forester
Ministry of Forests and Range
3rd Floor, 1520 Blanshard Street
Victoria, British Columbia
V8W 3C8

Dear Jim:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the responsibility for determining Allowable Annual Cuts-decisions with significant implications for the province's economy, communities and environment. This letter outlines the economic and social objectives of the Crown you should consider in determining Allowable Annual Cuts, as required by Section 8 of the *Forest Act*. This letter replaces the July 28, 1994 letter expressing the economic and social objectives of the Crown, and the February 26, 1996 letter expressing the Crown's economic and social objectives for visual resources. The government's objective for visual quality is now stated in the Forest Practices and Planning Regulation of the *Forest and Range Practices Act*.

Two of this government's goals are to create more jobs per capita than anywhere in Canada and to lead the world in sustainable environmental management. The Ministry of Forests and Range supports these objectives through its own goals of sustainable forest and range resources and benefits. In making Allowable Annual Cut determinations, I ask that you consider the importance of a stable timber supply in maintaining a competitive and sustainable forest industry, while being mindful of other forest values.

The interior of British Columbia is in the midst of an unprecedented mountain pine beetle outbreak. Government's objectives for management of the infestation are contained in British Columbia's Mountain Pine Beetle Action Plan. Of particular relevance to Allowable Annual Cut determinations are the objectives of encouraging long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land use plans.

Minister of Forests and Range and Minister Responsible for Housing

Office of the Minister

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Jim Snetsinger

To assist the province and affected communities in planning their responses to the beetle infestation, it would be best to have realistic assessments of timber volumes that can be utilized economically. Therefore, in determining the best rate of harvest to capture the economic value from beetle-killed timber, I ask that you examine factors that affect the demand for such timber and products manufactured from it, the time period over which it can be utilized, and consider ways to maintain or enhance the mid-term timber supply.

The coast of British Columbia is experiencing a period of significant change and transition. In making Allowable Annual Cut determinations I urge you to consider the nature of timber supply that can contribute to a sustainable coast forest industry, while reflecting decisions made in land and resource management plans.

You should also consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

Sincerely yours,

Rich Coleman
Minister