

**BRITISH COLUMBIA
MINISTRY OF FORESTS LANDS AND
NATURAL RESOURCE OPERATIONS**

Fraser Timber Supply Area

**Rationale for
Allowable Annual Cut (AAC)
Determination**

Effective February 18, 2016

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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 in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Fraser Timber Supply Area (TSA). This document also identifies where new or better information is needed for incorporation in future determinations.

Acknowledgement

For preparation of the information I have considered in this determination, I am indebted to staff of the BC Ministry of Forests, Lands and Natural Resource Operations (FLNR) in the Chilliwack Natural Resource District, and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to local residents, First Nations, and stakeholders who contributed to this process.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider a number of specified factors in determining AACs for TSAs and TFLs. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document.

Description of the Fraser Timber Supply Area

The Fraser TSA, located in the southern portion of British Columbia's South Coast Natural Resource Region, covers approximately 1.4 million hectares and is administered from the Chilliwack Natural Resource District office. It is the most densely populated TSA in the province, encompassing major population centres in the Lower Mainland and Fraser Valley.

There are 34 First Nations Bands and three Nation/Tribal Organizations that have asserted traditional territories within the Fraser TSA. An additional 28 First Nations and six Nation/Tribal Organizations are located outside the TSA whose traditional territories extend into the Fraser TSA.

The Fraser TSA is a biologically diverse region, with five biogeoclimatic zones providing habitat for more than 300 species of resident and migratory birds, 45 species of mammals, 11 species of amphibians, and 5 species of reptiles. The TSA is bordered by the Coast Mountains to the north and to the east. Tributaries and lakes drain from this area into the Fraser River, flowing through the broad, riverine plain lying between the community of Hope to the east and the city of Vancouver to the West, on toward the extensive delta of the Fraser estuary and into the saltwater of Georgia Strait. While the coastal western hemlock zone is the most abundant zone in the TSA, the diverse landscapes support 13 commercial tree species.

The TSA includes both major urban population centres, where various service sectors combine to provide about 70 percent of the region's employment, and smaller rural communities, where primary sectors including forestry provide important sources of employment and economic activity.

History of the AAC for the Fraser TSA

The AAC for the Fraser TSA was first set in 1978 at 1 643 000 cubic metres. In 1979, it was increased to 1 700 000 cubic metres. This level was maintained until 1987, when the AAC was increased to 1 765 000, including a partition of 65 000 cubic metres for predominantly deciduous stands.

In 1995, following the first timber supply review (TSR), the AAC was set at 1 550 000 cubic metres, including a partition of 57 000 cubic metres attributable to predominately deciduous stands.

On April 1, 1999, the AAC was set at 1 270 000 cubic metres, including a partition of 32 500 cubic metres for deciduous-leading stands. Although the AAC was maintained at the 1999 level with the August 2004 determination, the AAC partition for deciduous stands was discontinued.

In 2011, the AAC was reduced under the Allowable Annual Cut Administration Regulation to 1 239 100 cubic metres to account for the establishment of the Cascades Lower Canyon Community Forest. This is the AAC in effect prior to this determination.

In 2014, a woodlot licence with an AAC of 3400 cubic metres was issued within the TSA. Although the Allowable Annual Cut Administration Regulation does not reduce the AAC when a woodlot licence is issued, for the purposes of this determination, I will account for the issuance of this woodlot licence. Therefore, I consider the current effective TSA for the Fraser TSA prior to this determination to be 1 235 700 cubic metres.

New AAC determination

Effective February 18, 2016, the new AAC for the Fraser TSA is 1 235 700 cubic metres.

This AAC will remain in effect until a new AAC is determined, which must take place within 10 years of this determination.

Information sources used in the AAC determination

The information sources considered in determining this AAC for the Fraser TSA include but are not limited to, the following:

- *Spotted Owl Management Plan, Resource Management Plans: Chilliwack Forest District*, (1999), BC Ministry of Environment, Lands and Parks and BC Ministry of Forests;
- *Adapting forest management to climate change in the West and South Coast Regions: Considerations for planners and practitioners*, (2014 draft), BC Ministry of Forests, Lands, and Natural Resource Operations;
- *Coast Forest Action Plan*, (2007), BC Ministry of Forests and Range, Victoria, BC;
- *Mark Monthly Billing History Reports (2000-2014)*; BC Ministry of Forests, Lands, and Natural Resource Operations, Harvest Billing System;
- *Procedures for Factoring Visual Resources into Timber Supply Analyses*, (1998), BC Ministry of Forests, Forest Practices Branch, REC-029, Victoria, BC;
- *OAF1 Project Report #2: Ground-based survey method*, (1998), BC Ministry of Forests, Forest Practices Branch, Victoria, BC;
- *Major Primary Timber Processing Facilities in BC 2013*, (2015), BC Ministry of Forests, Lands, and Natural Resource Operations, Competitiveness and Innovation Branch, Victoria, BC;
- *Coast Area, Climate Change Action Plan 2015 – 2020*, (May 2015), BC Ministry of Forests, Lands, and Natural Resource Operations, Victoria, BC;
- *Documentation of Analysis for Vegetation Resources Inventory Statistical Adjustment*, (March 2002), BC Ministry of Sustainable Resource Management, Terrestrial Information Branch, Victoria, BC;
- *Identified Wildlife Management Strategy, Procedures for Managing Identified Wildlife*, (2004), BC Ministry of Water, Land and Air Protection, Victoria, BC;

- *First Nations Consultation Summary Chilliwack Natural Resource District, Decision on the Allowable Annual Cut (AAC) for the Fraser TSA – Timber Supply Review 4*, 2015, Ministry of Forests, Lands and Natural Resources Operations;
- Information received from the public review of the Fraser TSA Timber Supply Review Public Discussion Paper (2015);
- People of the River Referrals Office and *S'ólh Téméxw Use Plan Policy – Public Policy v1.0*, (December 19, 2014);
- People of the River Referrals Office and Ministry of Forests, Lands and Natural Resource Operations, *Timber Supply Analysis of the S'ólh Téméxw Use Plan* (September 30, 2015);
- Silvacare Inc. Traditional Territory THLB Analysis supporting First Nation Woodlot Licence Planning, Ts'elxwéyeqw Tribe Management Ltd., Updated October 21, 2014 (2014);
- Biogeoclimatic Ecosystem Classification (BEC) Program <https://www.for.gov.bc.ca/hre/becweb/>
- *Fraser Timber Supply Area Timber Supply Review: Postponement Binder*, (2008), BC Ministry of Forests and Range, Forest Analysis and Inventory Branch, Victoria, BC;
- *Fraser TSA Timber Supply Review: AAC Postponement letter* and supporting material, (2008), BC Ministry of Forests, Lands, and Natural Resource Operations, Forest Analysis and Inventory Branch, Victoria, BC;
- *Fraser Timber Supply Area Timber Supply Review: Data Package*, (2013), BC Ministry of Forests, Lands, and Natural Resource Operations, Forest Analysis and Inventory Branch, Victoria, BC;
- *Fraser TSA Timber Supply Review: Public Discussion Paper*, (2015), BC Ministry of Forests, Lands, and Natural Resource Operations, Forest Analysis and Inventory Branch, Victoria, BC;
- *Fraser Timber Supply Area Rationale for Allowable Annual Cut determination*, (2004), BC Ministry of Forests, Forest Analysis Branch, Victoria, BC;
- *Fraser Timber Supply Area Analysis Report*, (Dec 2003), BC Ministry of Forests, Forest Analysis Branch, Victoria, BC;
- *Fraser Timber Supply Area Public Discussion Paper*, (Dec 2003), BC Ministry of Forests, Forest Analysis Branch, Victoria, BC;
- *Letter conveying government's objectives regarding the achievement of acceptable impacts on timber supply from biodiversity management*, August 25, 1997, Deputy Ministers of Forests and of Environment, Lands and Parks;
- *Letter from the Minister of Forests and Range to the Chief Forester stating the economic and social objectives of the Crown*, July 4, 2006;
- Order Establishing Provincial Non-Spatial Old Growth Objectives (2004);
- *Forest Act* and Regulations, (current to January 27, 2016);
- *Forest and Range Practices Act* and Regulations, (current to January 27, 2016);
- *Forest Practices Code of British Columbia Act* and Regulations, (current to January 27, 2016);
- *Heritage Conservation Act*, (current to January 27, 2016);
- *Land Act*, (current to January 27, 2016);
- *Ministry of Forests and Range Act*, (January 27, 2016).

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 have differing levels of uncertainty associated with them, 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 Fraser 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

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining the AACs for TSAs and tree farm licences. The following guiding principles were developed by the former chief forester and deputy chief foresters and I, as the current chief forester, find them reasonable and appropriate and I have adopted them as described below in making my AAC determination for the Fraser TSA.

Given the large number of periodic AAC determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in addressing relevant factors associated with AAC determinations. In order to make our approach in these matters explicit, we, the chief forester and deputy chief forester, jointly established the following body of guiding principles. However, in any specific circumstance in a determination where we consider it necessary to deviate from these principles, we will explain our reasoning in detail.

When considering the factors required under Section 8, we are also mindful of our obligation as stewards of the forests of British Columbia, of the mandate of the Ministry of Forests, Lands and Natural Resource Operations as set out in Section 4 of the *Ministry of Forests and Range Act*, and of our responsibilities under the *Forest Act* and *Forest and Range Practices Act (FRPA)*.

Integrated decision-making

One of the key objectives of the Ministry of Forests, Lands and Natural Resource Operations is to take an integrated approach to all resource management decisions that considers all resource values. In considering the factors outlined in Section 8 of the *Forest Act*, we will continue to consider all available information on timber and non-timber resources in the management unit, and all available information on the interactions of the management of those resources on timber supply.

Information uncertainty

Given the complex and dynamic nature of forest ecosystems coupled with changes in resource use patterns and social priorities there is always a degree of uncertainty in the information used in AAC determinations.

Two important ways of dealing with this uncertainty are:

- (i) managing risks by evaluating the significance of specific uncertainties associated with the current information and assessing the various potential current and future, social, economic and environmental risks associated with a range of possible AACs; and
- (ii) 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, it is important to reflect those factors, as closely as possible, that are a reasonable extrapolation of current practices. It is not appropriate to base decisions on proposed or potential practices that could affect the timber supply but 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, this uncertainty is taken into account to the extent possible in the context of the best available information.

It is not appropriate 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 FRPA. In cases where there is a clear intent by government to implement these decisions that have not yet been finalized, we 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 on-going plan implementation decisions.

Where appropriate, information will be considered regarding 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.

We acknowledge the perspective that alternate strategies for dealing with information uncertainty are to delay AAC determinations or to generally reduce AACs in the interest of caution. However, given that there will always be uncertainty in information and due to the significant impacts that AAC determinations can have on communities, we believe that no responsible AAC determination can be made solely on the basis of a response to uncertainty.

Nevertheless, in making a determination, allowances may need to be made to address risks that arise because of uncertainty by applying judgment to the available information. Where appropriate, the social and economic interests of the Crown, as articulated by the Minister of Forests, Lands and Natural Resource Operations, can assist in evaluating this uncertainty.

Climate change

One key area of uncertainty relates to climate change. While some controversy appears to remain on the causes of climate change, there is substantial scientific agreement that climate is changing, that the changes will affect forest ecosystems, and that forest management practices will need to be adapted. Nevertheless, the potential rate, amount, and specific characteristics of climate change in different parts of the province are uncertain. As research provides more definitive information on climate change, we will consider the findings in AAC determinations. Where forest practices are implemented to mitigate or adapt to the potential effects of climate change on forest resources, we will consider related information in our determinations.

In addition, vulnerability assessments can provide information on the potential risks associated with climate change, and could be useful in defining how to consider climate change in different AAC determinations. Such assessments could also highlight key topics in need of research that could improve climate change considerations for future determinations.

We note, however, that even with better information on climate change there will be a range of reasonable management responses. Considerations of how to respond in anticipation of uncertain, potential future impacts and risks differ from those related to responding to known or on-going processes such as the recent MPB infestation. For example, it is not clear if either increases or decreases to current harvest levels would be appropriate in addressing potential future increases in natural disturbance due to climate change. Conversely, the present forest conditions resulting from the MPB infestation provide a clearer circumstance to which to respond.

To some extent, decisions on the preferred management responses to potential future risks, including potential changes to allowable timber harvests, are appropriately informed by broad discussion among interested parties. We will monitor such discussions and consider them insofar as they are relevant to AAC determinations. In general, the requirement for regular AAC reviews will allow for the incorporation of new information on climate change and its effects on forests and timber supply as it emerges.

First Nations

Aboriginal Title Lands and other areas, such as Treaty Lands or Indian Reserves, are not provincial Crown land. Consequently, the timber on these lands does not contribute to the AAC of the timber supply area or tree farm licence with which they overlap. For other areas, where aboriginal title has not been legally proven, the Crown has a legal obligation to consult with First Nations regarding their 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, full consideration will be given to:

- (i) the information provided to First Nations to explain the timber supply review process;
- (ii) any information brought forward respecting First Nations' Aboriginal Interests, including how these interests may be impacted; and
- (iii) any operational plans and/or other information that describe how First Nations' Aboriginal Interests are addressed through specific actions and forest practices.

Aboriginal Interests that may be adversely impacted by an AAC decision will be considered, and where appropriate, addressed in a manner that is consistent with the scope of authority granted to the chief forester under Section 8 of the *Forest Act*. When information is brought forward that is outside of the chief forester's jurisdiction, this information will be forwarded to the appropriate decision makers for their consideration. Specific considerations identified by First Nations in relation to their Aboriginal Interests and the AAC determination are addressed in the various sections of this rationale.

AAC determinations should not be construed as limiting the Crown's legal obligations owed to First Nations in any way, and in this respect it should be noted that the determinations do not prescribe a particular plan of harvesting activity within the management units. They are also independent of any decisions by the Minister of Forests, Lands and Natural Resource Operations with respect to subsequent allocation of wood supply.

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 projections provided to me through the work of the Timber Supply Review Program (TSR) for TSAs and 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 model, a series of timber supply forecasts can be produced to reflect 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 forest lands. This is known as the "base case" 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 and legal requirements.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case 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 model 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 are realistic and current, and the degree to which resulting predictions of timber supply must be adjusted to more properly reflect the current and foreseeable situation.

These adjustments are made on the basis of informed judgment using currently available information about forest management, and that information may well have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans.

Thus, in reviewing the considerations that lead to the AAC determination, it is important to remember that the AAC determination itself is not simply a calculation. Even though the timber supply analysis I am provided is integral to those considerations, the AAC determination is a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case. Judgments that in part may be based on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation would be gained by attempting a computer analysis of the combined considerations.

Base case for the Fraser TSA

The base case prepared for the Fraser TSA showed that a harvest level of 1 260 000 cubic metres per year could be maintained across the entire forecast period. This harvest level is two percent higher than the current effective AAC of 1 235 700 cubic metres.

The base case harvest level is 17 percent lower than the long-term level projected in the 2003 base case, primarily as a result of the new lower site productivity estimates for managed stands.

Alder-leading stands initially contribute 10 000 cubic metres per year to the base case. This contribution decreases over time to 7400 cubic metres per year.

In addition to the base case, I was provided with a number of sensitivity analyses and alternative harvest forecasts carried out using the base case as a reference. These analyses and others have been helpful in specific considerations and reasoning in my determination as documented in the following sections. I am satisfied that the base case, and the other analyses as noted and described, represent the best information currently available to me respecting various aspects of the projection of the timber supply in this TSA, and that as such they are suitable for reference in my considerations in this determination.

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

I have reviewed the information for all of the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case represents current legal requirements, demonstrated forest management and/ 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.

Table 1. Section 8 of the Forest Act: factors accepted as modelled in the base case

<i>Forest Act</i> section and description	Factors accepted as modelled
8(8)(a)(i) Composition of the forest and its expected rate of growth	<ul style="list-style-type: none"> • Land Ownership and Forest Tenures Not Contributing to Timber Supply • Non-Forest Areas • Parks and Protected Areas • Exclusion of Geographically Defined Areas • Existing and Future Roads, Trails and Landings • Environmentally sensitive areas • Sites with Low Timber Growing Potential • Unmerchantable Forest Types • Sites with Adequate Timber Potential but Insufficient Volume • Timber Licence Reversions • Forest Inventory • Volume Estimates for Existing Stands
8(8)(a)(ii) Expected time that it will take the forest to become re-established following denudation	<ul style="list-style-type: none"> • Site Productivity Estimates • Regeneration Delays • NSR and Backlog

8(8)(a)(iii) Silvicultural treatments to be applied	<ul style="list-style-type: none"> • Silviculture Systems • Incremental Silviculture
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	<ul style="list-style-type: none"> • Decay, Waste, and Breakage
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	<ul style="list-style-type: none"> • Experimental and Permanent Sample Plots • Ungulate Winter Range Reductions • Wildlife Habitat Area Reductions • Spotted Owl • Riparian Reserve Zones • Landscape Level Biodiversity • Stand Level Biodiversity • Recreation Resources
8(8)(a)(vi) Any other information	
8(8)(b) The short and long term implications to British Columbia of alternative rates of timber harvesting from the area	<ul style="list-style-type: none"> • Alternative Harvest Flows
8(8)(d) Economic and social objectives of the government	<ul style="list-style-type: none"> • Community Implications • Economic and Social Objectives of the Crown • Local Objectives and Public Comments

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.

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 timber harvesting

- general comments

The timber harvesting land base (THLB) is an estimate of the land where timber harvesting is considered both acceptable and economically feasible, given the objectives for all relevant forest values, existing timber quality, market values and applicable technology. It is a strategic-level estimate used for timber supply analysis and as such could include some areas that may never be harvested or could exclude some areas that may be harvested. Furthermore, whether or not an area is included in the THLB, or excluded from the THLB has no bearing on subsequent operational decisions. Consequently, the THLB estimate used in the base case has limited utility outside of the timber supply review process.

As part of the process used to define the THLB, a series of deductions was made from the Crown forest land base (CFLB). These deductions account for economic or ecological factors that reduce the forest area available for harvesting. In reviewing these deductions, I am aware that some areas may have more than one classification. To ensure accuracy in defining the THLB, care has been taken to avoid any potential double-counting associated with overlapping objectives. Hence, a specific deduction for a given factor reported in the analysis or in this document does not necessarily reflect the total area with that classification; some portion of it may have been deducted earlier under another classification.

For the Fraser TSA, I accept that the above approach was used appropriately to identify the THLB used in the base case and related analyses.

- operability mapping

In deriving the THLB for the base case those portions of the TSA that are not physically accessible for harvesting, or that are not feasible to harvest economically, were excluded as inoperable. The operability mapping used in the base case was developed in 1996 in collaboration with timber licensees. At that time, areas were classified based on physical accessibility, harvesting method (conventional or helicopter), and stand merchantability. Previously harvested areas, identified using the 2013 FAIB cutblock inventory, were considered operable. The total area excluded from the THLB as inoperable was 258 788 hectares which is about 41 percent of the CFLB.

Although no new operability mapping was submitted by licensees, the results of a 2007 study completed by Timberline Forest Inventory Consultants for the Fraser TSA Cooperative Association (FCA) suggested that the 1996 operability mapping underestimated the operable area in the TSA by 20 percent. In a separate assessment prepared in 2008, district staff found that about eight percent of the harvested area in the TSA was outside the THLB derived for the previous timber supply review.

During public review, Teal Cedar Products Ltd. noted that it had harvested more than 700 hectares of stands beyond the 1996 operability lines and that this was consistent with the findings in the 2007 FCA report. On this basis, Teal Cedar Products Ltd. requested that operability in the TSA be re-evaluated to include the harvested areas beyond the operability line, as well as any stands with similar characteristics elsewhere in the TSA.

FLNR staff note that all stands harvested up to 2013, both inside and outside the operability line, were included in the THLB for the base case. A comparison of the profile of previously harvested stands beyond the operability line with the profile of all stands in the THLB indicated that the site index distribution (productivity) of the profiles was similar.

In a separate submission, Lakeside Pacific Forest Products Ltd. indicated that harvesting has occurred in areas classified as inoperable. Although the company generally agreed with the “accessible” operability lines in its historic operating area on the west and east sides of Harrison Lake, it noted that there was an opportunity to revise these lines to account for areas adjacent to previously harvested areas, vegetation resources inventory information and isolated areas of timber. If applied to a broader area the company thinks these revisions could result in significant changes in operability mapping.

Ledcor Resources and Transportation Limited Partnership (Ledcor), which does not have a timber tenure in the Fraser TSA, maintains that some of the areas included in the 600 000 hectares classified as “not productive”, “inoperable”, “non-merchantable” and/or “low site stands” (collectively referred to as “marginal stands”) excluded from the THLB would meet its mill requirements. Furthermore, it maintains that some of these sites could realize their full growth potential if they were harvested and replaced with well-stocked managed stands. Ledcor asked that I consider establishing a partition for

marginal stands such that, if after this determination the minister issued a licence attributable to marginal stands, the volume could be charged against the partition.

I note that the THLB derived for a timber supply review is a strategic level estimate of the area that is available for timber harvesting and as such there will always be areas included that may not be operable and areas excluded that may be operable. In consideration of the information, and in the absence of demonstrated performance in marginal stands, I see no reason to include these stand types in the THLB nor to account for their theoretical contribution to the harvest level. Consequently, I will not institute a partition in the AAC for marginal stands. However, the absence of a partition does not prevent these stands from being harvested and the volume being billed against the AAC. If following this determination harvesting occurs in some marginal stands, this information will be used to derive the THLB for the next timber supply review.

Although apportionment of the AAC and the issuance of licences are outside of the scope of my authority in determining an AAC, I understand that Ledcor has received a response from Minister Thomson regarding its licence interests. District staff have also informed me that a competitive award licence for underutilized stands—older hemlock and balsam stands with high operating costs located in the north-eastern portion of the TSA—is planned.

Although the 1996 operability information used to define the THLB assumed in the base case is likely outdated and harvesting is occurring or may be possible in areas currently excluded from the THLB, I conclude that the best available information was used and will make no adjustment to the base case on this account.

As summarized in the ‘**Implementation**’ section of this rationale, I request that prior to the next determination, district and licensee staff review and, if necessary, revise the operability mapping for the Fraser TSA.

Existing forest inventory

I am satisfied that the best available forest inventory information was used for the base case and I will make no adjustment to the base case on this account.

Expected rate of growth

- volume estimates for managed stands

For the timber supply analysis, the Table Interpolation Program for Stand Yields (TIPSY) model was used to estimate the growth and yield of recently planted and future stands. Operational adjustment factors (OAF) were used to adjust the TIPSY yield estimates to account for certain operational conditions, such as less-than-ideal tree distribution, the presence of small non-productive areas and endemic pests and diseases. In the base case, the standard values for OAF 1 of 15 percent and OAF 2 of five percent were applied.

In the period from 2013 to 2015, district staff collected field data from a cross section of 61 cutblocks in the Fraser TSA, using a 1998 OAF 1 sampling method described in “*OAF1 Project Report #2: Ground-based survey method*”. Of the 61 cutblocks sampled, 41 were Douglas-fir leading and 10 were balsam-leading. The sampling showed that 39 of the Douglas-fir leading blocks and 8 of the balsam-fir leading blocks had OAF 1 values of zero. The average OAF 1 values for all surveyed Douglas-fir and balsam-fir stands, were 0.3 percent and 3.7 percent, respectively.

In a sensitivity analysis prepared to examine the effect of uncertain OAF 1 values, reducing the OAF 1 value for managed Douglas-fir leading stands from 15 percent to 12 percent resulted in a harvest level two percent higher than in the base case.

The 1998 OAF 1 sampling method, although deemed acceptable at the time of its development, is now considered to be insufficient and its use is no longer supported by FAIB. The reason for this change is that although the methodology does estimate the yield adjustment needed to account for gaps in stands at free-growing age it does not account for other yield reducing factors that accumulate over time and are not observable in young stands. Therefore, there is uncertainty as to how the OAF 1 values measured in young stands relate to the OAF 1 values in stands at the time of harvest. In addition, there is often uncertainty about how the results for the population of stands sampled apply to the larger TSA.

FAIB has initiated a Young Stand Monitoring (YSM) program to monitor the growth of young stands over time for comparison with the TIPSYS projections. The information from this program will be used to improve the reliability of the OAF values used in the estimation of managed stand yields. In the interim, FAIB recommends that the 1998 OAF 1 study results should only be used as a general indicator of uncertainty.

Based on my consideration of the managed stand yield information and the advice received from FAIB staff, I conclude that the productivity of Douglas-fir leading stands used in the base case was underestimated by an unquantified amount. In considering the timber supply implications of this uncertainty, I am guided by the results of the sensitivity analysis described above in which a three percent decrease in the OAF 1 value for Douglas-fir leading stands resulted in a harvest level two percent lower than in the base case. From this I conclude, that the base case harvest level is underestimated by an unquantified amount of up to two percent, and I will discuss this further in the **'Reasons for Decision'** section.

In order to reduce the uncertainty associated with managed stand yields, in particular Douglas-fir leading stands, I expect FLNR staff to continue to refine the information used to project managed stand yields, including the work conducted under the YSM program. I have noted this in the **'Implementation'** section of this rationale.

- minimum harvest criteria

Minimum harvest criteria determine when a stand is available for harvest in a timber supply model. For the base case, stands had to achieve both a minimum harvestable age (MHA) and a minimum harvestable volume (MHV) in order to be eligible for harvest. The MHA for each analysis group (an aggregation of similar stands), was based on the larger of either the estimated age at which the stand attained a specified minimum volume or the age at which the stand's mean average annual increment (MAI) reached 95 percent of its maximum level or culmination mean annual increment (CMAI).

Application of these criteria resulted in MHAs of 70 to 80 years for all cedar stands, 80 to 110 years for low-site Douglas-fir stands, 50 to 80 years for good-site Douglas-fir stands, 130 to 190 years for low-site hemlock/balsam, 60 to 120 years for good-site hemlock/balsam, 70 years for pine/larch, 90 years for spruce and 50 years for alder. The MHV for conventional harvesting was 350 cubic metres per hectare for all stand types except pine/larch and alder for which the MHV was 300 cubic metres per hectare and 150 cubic metres per hectare, respectively. In order to be eligible for helicopter logging, stands had to have a MHV of at least 400 cubic metres per hectare.

For comparison, a summary of cruise inventory data for the Fraser TSA collected in the period 2003 to 2012 indicates that 97 percent of the cruised stands had a volume per hectare of at least 350 cubic metres.

Teal Cedar Ltd. stated that "There are numerous stands located throughout the TSA that have been spaced and/or fertilized over the last 30 years. Teal and other licensees have, and will continue to, harvest these stands despite their age. These stands have attained the piece size and volume levels that allow them to be economically harvested and merchandized. Therefore, we are requesting that the TSR base case should recognize that these intensively managed stands are currently merchantable and

therefore should not treat them as unmanaged stands by delaying harvest until the (unmanaged) minimum harvestable age criteria and desirable stand conditions are met”.

Ledcor Resources and Transportation Limited Partnership noted that there is a disparity within the current Fraser TSA in regards to stand ages and diversity across certain landscape units. For example, in some landscape units there may be an overabundance of stands between the ages of 21 to 40 years that are below CMAI but are growing slowly on good sites. Ledcor indicated that it may be possible to harvest these stands early (before CMAI) in specific areas to increase diversity and stand yields through better management.

In order to assess the timber supply effects of harvesting lower volume stands, a sensitivity analysis was prepared in which only the MHV criteria were applied and the criterion for conventional conifer harvesting was reduced from 350 cubic metres per hectare to 300 cubic metres per hectare. These changes reduced the MHA for all analysis units by an average of about 14 years. The lower MHAs had the effect of reducing the average harvest age and average volume per hectare, and as a consequence the long-term harvest level in the base case decreased by three percent starting in decade 14.

I accept the licensees’ assertions that there are stands in the Fraser TSA that are being harvested earlier or at lower volumes than were assumed in the base case. However, I note that the cruise inventory information indicates that 97 percent of the cruised stands had volumes of at least 350 cubic metres per hectare. On this basis, I conclude that the minimum harvest criteria used in the base case are a reasonable approximation of current demonstrated performance and are appropriate for use in the base case.

With respect to the comments received from Teal Cedar, I am concerned about the practice of harvesting stands that have yet to reach their maximum growth potential. While some of these stands may have piece sizes and volumes that make them merchantable, the continued premature harvest of young stands will reduce future timber supply as this practice has the same effect as decreasing the productivity of these sites in the TSA. For this reason, it is my expectation that district and licensee staff will monitor harvesting practices in young stands, and report this information to me annually, as summarized under ‘**Implementation**’.

Section 8 (8) (a) (ii) the expected time that it will take the forest to become re-established on the area following denudation:

No factors considered under this section require additional comment.

Section 8 (8) (a) (iii) silvicultural treatments to be applied to the area:

No factors considered under this section require additional comment.

Section 8 (8) (a) (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:

- utilization standards

Current regional utilization standards include a maximum stump height of 30 centimetres for all stands. For mature stands, minimum diameter at breast height is 17.5 centimetres and a minimum top diameter of 15 centimetres. For immature stands the minimum diameter at breast height is 12 centimetres and minimum top diameter is 10 centimetres.

The assumptions used in the base case are those used operationally with some minor variance in the minimum diameter at breast height and minimum top diameter for some stands. These differences amount to a small, unquantified underestimation in the short-term harvest level projected in the base case and I will account for this in my decision as discussed in my ‘**Reasons for Decision**’.

Section 8 (8) (a) (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 Ministry of Forests, Lands and Natural Resource Operations is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources 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. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

I encourage the practice of co-location of reserves to meet requirements of multiple resource values, such as for riparian, visual quality objectives, and karst resource features, where appropriate. Co-location is a sound approach for the management of complementary resource values.

- cultural heritage resources

A cultural heritage resource (CHR) is an object, site, or location of a traditional societal practice that is of historical, cultural or of archaeological significance to the province, a community, or an aboriginal people. CHRs include, but are not limited to, archaeological sites, structural features, heritage landscape features and traditional use sites.

An archaeological overview assessment (AOA) was completed for the Chilliwack Natural Resource District in 1999. The AOA mapped known archaeological sites, areas with high probability of culturally modified trees and habitation sites and identified major watercourses as potential First Nations travel corridors.

Where subsequent field investigations confirm the presence of archaeological sites, sites are mapped as a non-standard geographic information system (GIS) file. These point locations are identified in the Remote Access to Archaeological Data (RAAD) and buffered using a minimum of one hectare.

In the Fraser TSA, known archaeological sites cover a total area of 1022 hectares. After accounting for overlap with areas that have already been excluded from the THLB for other values, the net area excluded from the THLB was 524 hectares.

Ts’elxweyeqw Tribe Management Ltd. (TTML) commented that important Stó:lō and Ts’elxweyeqw cultural and spiritual sites must be mapped to create and provincially register them as visual points for use in the establishment of visual quality objectives within S’ólh Téméxw. The TTML also stated that the AAC calculation and determination must account for Stó:lō and Ts’elxweyeqw cultural sites and values (transformer sites in particular) and areas of Notation of Interest, such as Slesse Watershed in the Chilliwack River Valley. They further commented that at least 0.5 percent of the total AAC should be excluded from the calculation to account for future archaeological findings and their buffers.

Staff note that a notation of interest designation does not withdraw the land from use, but rather simply allows for referral of land applications to the interested agency or local government. District staff have indicated that important First Nations cultural heritage resources exist outside of identified archaeological sites, and that some elements of these resources are protected through co-location with existing reserve areas (e.g., old growth management areas and riparian forests) while other elements,

such as large cultural zones and spiritual areas, are not. Staff informed me that these areas are currently being protected either through the exclusion of timber harvesting or changes in the licensees' planned forest development activities.

I agree that important Stó:lō and Ts'elxwéyeqw cultural and spiritual sites need to be mapped and that this information needs to be shared with the province so that it can be used in the establishment of land use objectives, decision making and operational planning. However, in considering the recommendation that I decrease the AAC to account for Stó:lō and Ts'elxwéyeqw cultural sites and values, I note that although the district is working to ensure that these areas are being managed appropriately, the province has not provided any legal direction that would exclude timber harvesting from these areas. Therefore, in keeping with my guiding principle not to speculate on decisions that have yet to be made by government, I will not account for these areas in this determination.

If following this determination, government establishes legal requirements for these areas that exclude timber harvesting, I am prepared to re-visit this AAC determination earlier than required in legislation.

The Kwikwetlem First Nation commented that the archaeological overview assessment (AOA) currently used by FNLR is outdated (1999) and that a great deal of information has become available since then. Work in Coquitlam Lake and nearby watersheds demonstrated that mid- and upper-elevation forested areas hold more significant archaeological resource potential than provided in the existing model, and such locales may not be considered for an AIA under the current AOA. They also noted that page 6 of the data package states archaeological and other First Nations' heritage resources are discussed/considered, but note that the section defining protected areas indicates only recorded archaeological sites are excluded from timber harvesting operations. They stated that the significance of heritage and traditional knowledge/use sites to the Nation does not reside on the presence or absence of physical remains, and there should be provisions for protection of heritage sites without physical remains, in certain circumstances. They also requested to meet with Ministry representatives to discuss these and other issues arising from the TSR process.

The Kwikwetlem First Nation was provided with written response to their comments and district staff extended an invitation to meet and discuss the comments regarding the AOA with the Nation or its archaeology consultants, however, there was no response to this offer.

I agree with the Kwikwetlem First Nation that the information regarding cultural heritage resources is outdated and very likely incomplete.

I have considered the cultural heritage resource information and how it was addressed in the base case, as well as the comments received from the Ts'elxwéyeqw Tribe Management Ltd. and the Kwikwetlem First Nation. From this, I conclude that the best available information was used and I will make no adjustments to the base case on this account. However, I am aware that the currently available information and definitions for cultural heritage resources are outdated and likely incomplete.

I appreciate the information that has already been shared and the collaborative approach being taken to manage important cultural heritage resources in the Fraser TSA. And as reiterated in '**Implementation**', I encourage the Ts'elxwéyeqw Tribe Management Ltd. and the Kwikwetlem First Nation, along with other First Nations, to find ways to enhance the information currently available to district staff and licensees on an ongoing basis. In this manner, it can be considered in subsequent timber supply review for the Fraser TSA.

- karst resources

In 2010, a Government Actions Regulation (GAR) Order established specific elements of karst systems as resource features (e.g., limestone fluted rock surfaces, sinkholes, and caves) within the Chilliwack Natural Resource District. This designation results in protection under FRPA's Forest Planning and Practices Regulation for specified karst elements.

The GAR Karst Resource Feature Order is non-spatial in nature. Karst features are expected to be managed under professional reliance and their management will reflect the best management practices in the *Karst Management Handbook* and karst inventories.

District staff note that although there has been some mapping of karst features in the Fraser TSA, occasionally there are instances where the features are not identified prior to logging. Staff indicate that in general, karst resource features within the THLB are expected to be managed through existing constraints such as OGMAs, spotted owl management areas, visual constraints and to a large extent by placement of wildlife tree retention (WTR) areas over karst features during operational planning.

In the base case, it was assumed that the tree retention necessary for the protection of karst features was captured by THLB reductions for WTR and other reserved areas. As a result no specific THLB reductions were made for karst resources.

Based on my discussions with district staff I accept that co-location of areas reserved from harvesting to meet other forest values (e.g., old growth management areas, spotted owl management areas, and wildlife tree patches) represents the current management of karst features. Therefore, I conclude that the areas excluded from the THLB to account for the factors listed above also account for karst resources and I will make no adjustment to the base case on this account.

However, in order to reduce the risk of disturbing karst features operationally, I recommend that district staff work with licensees to develop a planning-level inventory of karst features, as well as ensure site plans in areas with a high karst occurrence reflect best management practices. I have included this in the '**Implementation**' section of this rationale.

- cutblock adjacency / green-up

Cutblock adjacency and green-up requirements were modelled in the base case by limiting the amount of harvesting in each landscape unit such that no more than 25 percent of the stands in the THLB were allowed to be less than the green-up age in any one period. The green-up age is the age at which the regenerating stands reach three metres in height. Spatial blocking or patch size constraints were not applied in the base case.

During consultation on the data package, the Ts'elxweyeqw Tribe indicated that they were unsure whether the province took stand-level operational constraints into account in the analysis and requested further information. Subsequently, FLNR staff met with representatives of Ts'elxweyeqw Tribe (March 13, 2015) to review the constraints applied in the base case. At that time, the Ts'elxweyeqw Tribe indicated that they were primarily interested in how these constraints applied to the Chilliwack River Valley. The timber supply analyst working on this timber supply review has committed to working with the Ts'elxweyeqw Tribe outside of this timber supply review process to provide additional information regarding the Chilliwack River Valley. This information will help inform an analysis of the area.

BC Timber Sales commented that spatial adjacency constraints would more closely mimic current operations than the aspatial constraints applied in the base case and requested that a sensitivity analysis using spatial adjacency be prepared for my consideration.

FLNR staff confirm that the application of aspatial adjacency constraints in the base case may slightly overestimate available timber supply. A sensitivity analysis was completed in which operational spatial adjacency was approximated by applying a 200-metre buffer around each harvested area. Areas within these buffers were then temporarily reserved from harvest for the duration of the green-up period. In addition, a patch-size distribution target based on natural disturbance types was applied. The results of the sensitivity analysis showed a harvest level for the first decade that was 4.8 percent lower than in the base case; thereafter, it increased slightly again to a level 2.5 percent lower than in the base case.

District staff have indicated that cutblock sizes in the Fraser TSA are generally about 10 to 20 hectares in size and smaller than the 40-hectare maximum. As a result, they believe there is room for licensees to expand cutblocks without being constrained by adjacency.

FAIB staff note that the sensitivity analysis results likely underestimate available timber supply, due to a limitation of the timber supply model in its ability to apply the same logical divisions of harvestable area or consider factors that real-world planners do to limit forest fragmentation and cutblock isolation. Staff suggest that the impact to the base case that results from applying spatial adjacency constraints that approximate operational constraints is likely up to 2.5 percent.

I have considered the information regarding the cutblock adjacency and green-up assumptions applied in base case as well as the input of FLNR staff. From this, I conclude that the base case harvest level is overestimated by up to 2.5 percent and I will discuss this further in my '**Reasons for Decision**'.

- visually sensitive areas

A visual quality objective (VQO) is a resource management objective established for an area that reflects the desired level of visual quality based on the physical characteristics and social concern for the area. Several visual quality classes have been defined in the Fraser TSA. The recommended classes for the Chilliwack Natural Resource District were continued as established visual quality objectives (VQO) under GAR Section 17, in October 2005.

In 2013, amendments were made to approximately 22 percent of the VQO boundaries in the northern portion of the TSA. These changes were based on a revised visual inventory, which considers factors such as public use, visibility and significant viewpoints, as well as comments submitted during consultation.

Guidelines to meet the VQOs include setting a maximum percentage of a specified area that is allowed to be denuded at any one time, and setting a visually effective green-up (VEG) height at which a regenerating stand is perceived by the public to be satisfactorily greened-up. In the timber supply analysis, forest cover objectives were applied that were consistent with the established VQOs. The maximum percent denudation was applied to each forested area in a visual polygon based on the assigned VQOs and assessed visual absorption capability (VAC). The constraints apply to approximately 170 244 hectares of the CFLB.

District staff indicate that the base case assumptions reasonably reflect current management for visual quality in the Fraser TSA.

Input received from the Hatzic Prairie, Durieu, McConnell Creek Ratepayers Association expressed concern regarding the impact of harvesting activities on the visual quality of viewscapes in the Hatzic Valley area.

District staff indicate that current management in the Hatzic Valley area is consistent with legal requirements for the VQOs set for the area. Staff have been working with the concerned parties to identify and address concerns, which could result in adjustments to future VQOs for the areas of concern.

Having reviewed the information regarding VQOs, I accept that the current legal requirements and management practices were accounted for in the base and will make no adjustments on this account. I commend staff for their work with stakeholders to address the concerns expressed about visual quality, and note that any adjustments to VQOs that occur can be reflected in subsequent timber supply reviews for the Fraser TSA.

- community watersheds and domestic water supply

There are 77 legally-designated community watersheds in the Chilliwack Natural Resource District. Although not all of these community watersheds are being used as sources of community or domestic

water, a forest cover constraint was applied to all of the watersheds for the base case. This constraint, which limited the rate of harvest within each watershed to one percent of the productive forest area each year, is consistent with the guidance in the *Community Watershed Guidebook*. These guidelines suggest that in the absence of a completed coastal watershed assessment, harvesting should be limited to five percent of the productive forest area over a five-year period.

The Hatzic Prairie, Durieu, McConnell Creek Ratepayers' Association commented that residents with water licences and wells are very concerned about the deleterious effects of logging and road activities on water quality, flow rate and sustainability in the Hatzic Valley watershed.

The Hatzic Valley, which contributes about 1246 hectares to the THLB, is not a legally-designated community watershed. District staff acknowledge the complexities of integrated resource use in the valley. Staff indicate that they ensure cutting permits and road permits in the watershed undergo a high level of review. District staff note that the review diligence on the part of both FLNR and forestry proponents reduces the rate and extent of timber harvesting in the Hatzic Valley to about the same level as in legally-designated watersheds (i.e., one percent of the productive forest area is harvested annually).

Having reviewed the assumptions applied in the base case to account for resource values in community watersheds, I accept that the base case adequately reflects current management and will make no adjustment on this account.

As described in 'Implementation', in the period prior to the next AAC determination, I encourage the district, in collaboration with the appropriate provincial agencies, to review the requirements for managing water resources as well as utilization of designated community watersheds, such that any updates to the information can be reflected in the next timber supply review for the TSA.

Section 8 (8) (a) (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber:

Historic harvest performance and forecasted harvest profile

An objective in timber supply analysis is to reflect, through the base case harvest sequencing assumptions, the actual harvesting behaviour in the TSA as accurately as possible.

To examine harvest performance data, FLNR staff analysed harvesting data from 2005 to 2014, using two data sets. Staff used VRI data in combination with cutblock maps to provide the proportion of inventory volume by tree species in harvested areas, and staff compiled data from the FLNR harvest billing system (HBS) to provide the proportion of scaled volume by tree species harvested.

Staff indicate that the analysis showed the proportion of volume in hemlock- and balsam-leading stands on the THLB is greater than the proportion of total volume harvested from hemlock- and balsam-leading stands over the past 10-year period. Approximately 58 percent of the THLB is covered in hemlock- and balsam-leading stands, whereas harvest performance in these stand types over the past 10 years averaged 42 percent.

District staff indicate that some of the older hemlock- and balsam-leading stands are less accessible, with correspondingly higher costs of harvest. The past underutilization of hemlock- and balsam-leading stands is likely related to markets and the availability of lower cost alternative stands for harvest.

Hemlock- and balsam-leading stands contribute approximately 54 percent towards the projected volume in the base case harvest forecast. Two sensitivity analyses were completed to assess the impact of limiting the contribution of hemlock- and balsam-stands to about 45 percent of the total harvest. In the first sensitivity analysis, no restriction was placed on the total harvest of old stands

(older than 115 years of age). The results showed that the same initial harvest level as in the base case could be achieved, but that the harvest level would decline by 10 percent after 20 years.

In the second sensitivity analysis, the contribution of hemlock- and balsam-stands was limited to about 45 percent of the total harvest and the contribution from the subgroup of old hemlock- and balsam-leading stands was limited to 21 percent of the total harvest. In this forecast the initial harvest level is also achieved and then declines in two steps of seven percent after 20 years.

A member of the public commented on the public discussion paper, expressing concern that the harvest of cedar appears to be at rates greater than the long-term supply projected in the base case. The commenter asked what strategies are being considered to balance cedar harvest with supply, and whether government is considering an AAC partition for cedar in the Fraser TSA.

District staff advise me that they are currently discussing the issue of cedar harvest relative to the cedar supply with forest licence holders in the TSA. The intent of the discussions is to ensure the harvest profile in the TSA is generally reflective of the available supply of volume by species in the TSA. I am aware that that a large proportion of the cedar volume harvested in the TSA is from mixed-species stands, and that a comparison of the proportion of volume harvest from cedar-leading stands shows that it more closely aligns with the available inventory. Given this information, and the ongoing co-operation between licensees and FLNR staff, I note that I will not specify an AAC partition for cedar-leading stands in my determination.

I have considered the information regarding the contribution of hemlock- and balsam-leading stands to timber supply as well as the recent harvest profile. The results of the sensitivity analysis demonstrate to me that timber supply is sensitive to a lower level of harvest of hemlock- and balsam-leading stands than these stands contribute to the THLB, and in particular, the older stands hemlock- and balsam-leading stands. I note that if the harvest performance in old-growth hemlock and balsam stands continues to be less than the contribution of these stands to the projected timber supply, the mid-term harvest level could be 10 to 14 percent lower than projected in the base case.

I caution licensees that it is important to harvest the stand profile in similar proportions to the available timber supply in the TSA. Continuing to avoid the harvest in old hemlock and balsam stands will result in a lower mid-term timber supply than in the base case. Due to the potential risk to mid-term timber supply it is my expectation that district staff will monitor harvest performance in old hemlock- and balsam-leading stands and report this information to me on an annual basis. I have noted this in the '**Implementation**' section of this rationale.

First Nations Consultation

There are 34 First Nations Bands and three nation/tribal organizations that have asserted traditional territories within the Fraser TSA. An additional 28 First Nations and six nation/tribal organizations located outside the TSA whose traditional territories extend into the Fraser TSA.

There are currently 28 First Nations actively involved in the forestry sector that have obtained area or volume based forest tenures within the Fraser TSA.

Currently, 44 First Nations that are either within or overlap the Fraser TSA have Forest Consultation and Revenue Sharing Agreements (FCRSA) with the Ministry of Forests, Lands and Natural Resource Operations. Of these 44 First Nations there are 14 communities and one tribal organization that are signatories to the Stó:lō Strategic Engagement Agreement (SEA) which was signed in April 2014.

These agreements contain provisions for consultation on administrative decisions including AAC determinations and were followed in the TSR consultation process.

A letter was sent to First Nations in July 2013 advising them about the pending consultation for the timber supply review for the Fraser TSA. Consultation was initiated in November 2013.

Lower Similkameen Indian Band

The Lower Similkameen Indian Band (LSIB) responded to the public discussion paper and stated that it has concerns for, and wishes to mitigate any potential impact to, floral resources and non-timber forest products within the Fraser TSA as these resources are central to their cultural practices. No further communication was received from the LSIB.

In considering the LSIB's concern, I note that although no areas were excluded from the THLB specifically for floral and non-timber forest products many of the areas excluded to account for other values, such as old-growth forest, wildlife tree retention, riparian areas, wildlife habitat etc., also provide for non-timber forest products and floral resources. This AAC determination does not authorize forestry operations in the Fraser TSA, all of which require consultation prior to approval. I have shared the input received from the LSIB with the district manager so that their need for continued access to non-timber forest products and floral resources can be accommodated in operational decisions.

Kwkwetlem First Nation

The Kwkwetlem First Nation commented that they were concerned that they could find no indication that potential impacts to Kwkwetlem's aboriginal rights and title were taken into consideration when analyzing the allowable cut for their traditional territory. They stated that aboriginal rights and aboriginal title have social and economic components that are of great value to Kwkwetlem members – and that the economic component of aboriginal title is a key issue for Kwkwetlem. They indicated that they would like to understand how the discussion paper considered impacts to aboriginal rights and aboriginal title and how these impacts would be considered by the chief forester.

In response, FLNR staff explained that the chief forester must address aboriginal interests that may be impacted by the AAC decision in a manner that is consistent with the scope of her authority under Section 8 of the *Forest Act*. This legislation requires her to consider a wide range of factors including, but not limited to, cultural heritage resources, wildlife habitat, riparian areas, fish habitat, water, old-growth forest, etc. Where more specific information regarding First Nations' aboriginal interests is available, the information is incorporated in the timber supply review for her consideration. With regard to aboriginal title, Aboriginal Title Lands, Treaty Lands and Indian Reserves are not Crown land and are excluded from the AAC determination. The AAC determined by the chief forester does not authorize any activities, including forestry operations, which require separate consultation.

Nooaitch Indian Band

A letter was received from the Nooaitch Indian Band requesting a sensitivity analysis for cultural values be completed as a component of the data information development and prior to the public discussion paper. Nooaitch mentioned that they have been endeavoring to engage the province on a process for managing Cultural Survival Areas (CSA) and cultural values for considerable time.

In response, FLNR staff requested that the Nooaitch First Nation share available information regarding these values and any other information that they would like the chief forester to consider. FLNR staff noted that this information could help to inform the timber supply analysis and allow the chief forester to consider how an AAC determination might affect these values and aboriginal interests. Through discussions with the Cascades Natural Resource District and the Nooaitch Indian Band, it was concluded that most of the concerns pertained to the timber supply review underway in the adjacent Merritt TSA. No further communication was received from the Nooaitch Indian Band for consideration in the AAC determination for the Fraser TSA.

Tsleil-Waututh Nation

The Tsleil-Waututh First Nation stated that the discussion paper has the potential to impact Tsleil-Waututh rights, title, and interests; and that ongoing consultation throughout the timber supply analysis review would be necessary to address potential impacts to Tsleil-Waututh rights and title as they arise. They also stated that a key goal of the Tsleil-Waututh community is to expand its participation in all planning and development processes that take place within the consultation area, in order to fulfill the Nation's role as stewards of the lands and resources of the territory, to protect Tsleil-Waututh Aboriginal rights, title, and interests, and to create greater economic and social results that can be equitably shared. The Tsleil-Waututh requested that the base case described in the paper, be utilized for the AAC determination, as it involves a lower rate of harvest.

As indicated throughout this document, I am using the base case described in the discussion paper as a reference point for assessing the timber supply in the Fraser TSA. I have also taken their preference for a lower rate of harvest into account in making my determination. As indicated throughout this document the timber supply review, including AAC determination do not determine where, how or even if harvesting will occur. Government is required to undertake separate consultation processes prior to any such decisions within Tsleil-Waututh territory.

Katzie First Nation

The Katzie First Nation raised concerns about the Blue Mountain Provincial Forest being included in the TSR as it is a "highly contentious area" that has not had any significant harvesting since the 1980's. They also stated that it is important that realities of harvesting within the Blue Mountain area be reflected in the Fraser TSA timber supply review process.

FLNR staff responded that at this time there is no legal designation or higher level plan order that limits or restricts timber harvesting in this area, and that the past timber supply review did not place a restriction on harvests levels over and above the typical conservancies for the area. As a consequence, these areas were assumed to contribute to the THLB used in the base case. FLNR staff informed me that they have committed to exploring the implications of reduced harvest levels for the Blue Mountain area outside to the timber supply review process. They also indicated that the Katzie First Nation are interested in an area-based tenure and that are currently working with the Kwantlen First Nation and BC Timber Sales on the development of an area-based First Nations Woodlands Licence.

I accept that the assumptions used in the base case for the Blue Mountain Provincial Forest represent current legal requirements. In the event that the legal requirements for this area change, the information can be accounted for in the next AAC determination.

Ts'elxweyeqw Tribe

The Ts'elxweyeqw Tribe commissioned an analysis that assessed sustainable harvest rates in the Chilliwack Valley for the Ts'elxweyeqw Forest Limited Partnership (the 'Traditional Territory THLB Analysis supporting First Nation Woodlot Licence Planning Ts'elxweyeqw Tribe Management Ltd. (TTML)'). In its input, the Ts'elxweyeqw Tribe requested a comparison of the results of this analysis with the province's timber supply analysis, in order to ascertain all factors important to Stó:lō are considered in the calculation and to ensure timber harvesting is sustainable not only from economic point of view, but also from Stó:lō's cultural and environmental perspectives.

The TTML analysis indicates that the Chilliwack River Valley contributes approximately 130 000 cubic metres to the Fraser TSA timber supply. The Ts'elxweyeqw Tribe further stated that there is a need to calculate the proposed AAC within S'ólh Téméxw, the traditional territory of the Stó:lō, and the value of the timber using current market rates, to argue for an increase in the stumpage fee returned to First Nations forestry companies by using a rationale other than the one currently used by the province, which is based on the type of agreements with First Nations.

FAIB staff have advised me that the current management assumptions applied in the TSR base case forecast are similar to those described in the Ts'elxweyeqw Tribe Traditional Territory THLB Analysis, and that the forecasted timber harvest from the Chilliwack Valley in the base case is similar to that in the TTML control scenario. FAIB staff also compared results of sensitivity analysis forecasts that approximated operational spatial adjacency and harvest constraints reflective of the S'ólh Téméxw Use Plan, and found results similar to equivalent scenarios in the TTML analysis. I note that I have addressed spatial adjacency under 'cutblock adjacency / green-up' and I will discuss my considerations of the S'ólh Téméxw Use Plan in the next factor in this document.

I have considered the input provided by First Nations during the consultation for the AAC determination for the Fraser TSA, and I have discussed the information in detail with FLNR staff. Some of the input received has also been discussed in other sections in this document. I am satisfied from reviewing the information regarding the consultation process followed for determination of the AAC for the Fraser TSA that the consultation obligations have been appropriately met for this determination.

- S'ólh Téméxw Use Plan

S'ólh Téméxw, the traditional territory of the Stó:lō, covers roughly 90 percent of the productive forest in the Fraser TSA and is overlapped by the territories of a number of First Nations located within and outside the TSA.

The S'ólh Téméxw Use Plan (STUP) is a high-level strategic planning tool that informs and balances the land use interests and needs of Stó:lō and others ranging from economic development to cultural heritage and environmental conservation and protection. It is currently being applied as an aspect of Stó:lō involvement in resource management and development planning broadly throughout S'ólh Téméxw, including for high-level strategic planning of land and resource use. It provides a key cultural data layer that is available to proponents to assist in resource development planning. Currently, cultural values identified in the STUP are accommodated at the operational level (e.g. through co-location with existing conservancies or operational flexibility). At this time, the province has not established the STUP through legislation or the issuance of legal orders).

FLNR staff collaborated with the People of the River Referrals Office (PRRO) and the Stó:lō Resource and Research Management Centre (SRRMC) to prepare a sensitivity analysis that incorporated management assumptions for the S'ólh Téméxw Use Plan and the Spiritual Practice Areas. These included reserving areas from timber harvesting or applying constraints to the rate of timber harvesting. The results show that if these constraints and assumptions are applied the timber supply projected in the base case may be lower than projected.

Although no elements of the STUP have been legally designated, operational practices are, through heritage referrals, recognizing the important values described in the plan and are being adjusted to protect them. The extent to which future timber supply may be affected by these changes is unknown and analysis such as the one conducted jointly by FLNR and PPRO provides valuable insight.

I am pleased that the data available through the STUP is being used to guide resource development at the operational level. I encourage licensees and district staff to continue to ensure that the spatial information regarding cultural values associated with the S'ólh Téméxw Use Plan informs operational decisions, and use the location of these values as anchors when considering placement of reserves to protect other resource values.

Having considered the information presented regarding the STUP and information presented under 'cultural heritage resources', I note that forest management practices related to the protection of First Nations cultural heritage resources are evolving in the Fraser TSA. As implementation of the STUP continues and as government formalizes the forest management requirements for both the STUP and areas of cultural and spiritual importance to First Nations whose territories include the

Fraser TSA, this information will be considered in AAC determinations. At any time, if there are changes either in legislation or new legal orders are issued that could significantly impact the timber supply for the Fraser TSA, I am prepared to revisit this determination earlier than the maximum period specified in Section 8 of the *Forest Act*.

Climate change

Climate change is predicted to impact forest ecosystems in a number of ways including a general increase in temperatures, change in precipitation patterns, and an increase in the frequency and severity of disturbances. While the trends are generally consistent, the specific magnitude of these changes, and their spatial and temporal distribution, are uncertain.

It is currently thought that fires will become more frequent and pests, such as Douglas-fir beetle, spruce beetle, and western balsam bark beetle may increase as summer drought stress weakens stands that were established under previous climatic conditions.

The results of computer modelling completed for the Fraser Valley suggest that growing seasons will lengthen which will benefit many tree species; however, the benefit will likely be offset in those areas where summer drought increases. Increases in summer drought appear to be likely in the eastern and north-eastern parts of the district, linked to generally lower summer precipitation and lower winter snowpack. It is also projected that there will be a significant reduction in the amount of area in the Alpine and Mountain Hemlock biogeoclimatic (BEC) zones and an expansion of the Coastal Western Hemlock BEC zone along the eastern part of the district.

While projected climate changes are likely to affect forest productivity and growth, the dynamics of natural disturbances and forest pests, and hydrological balances (e.g., drought stress), the magnitude and extent of impacts are uncertain.

Input from a member of the public requested further information about carbon sequestration analysis. Staff indicate a carbon analysis was completed which estimated net ecosystem carbon balances (NECB) and total carbon stocks for the base case as well as an alternative forecast that allowed old forest to be harvested in the short term at almost twice the rate of the base case.

NCEB calculations for both projections showed that, given the management assumptions applied, there would be positive net greenhouse gas (GHG) emissions from the TSA forests for the first 20 years after which there would be negative net GHG emissions as the forests act as a carbon sink. Although the differences between the projections were small, the base case had fewer GHG emissions for the first 80 years while the alternative forecast sequestered more carbon after 80 years. By year 150, the alternative forecast sequestered about 30 million tonnes CO₂e more than the base case over 150 years.

The results of the carbon analysis suggest faster conversion of old forest to younger stands could result in higher GHG benefits in the long term. However, this conclusion was based on the assumption that the older stands are replaced by faster growing second-growth stands and no other large-scale forest disturbances will occur during the forecasts.

Having considered the information provided regarding climate change and the Fraser TSA, I would like to commend staff for their work, which helps to improve our understanding of climate change and the potential effects this will have on forests. I have also found the results of the carbon modelling analysis helpful in understanding the dynamics of carbon sequestration as they relate to changes in the rate of harvest.

For this determination, I have considered the currently available climate change and carbon sequestration information. From this, I conclude that the level of uncertainty associated with climate change and its implications for forest dynamics and management, and carbon sequestration is too high for me to account for the potential timber supply impacts in the current AAC determination. However,

the requirement for the regular re-determination of AACs will ensure that as more information becomes available and the level of uncertainty is reduced the necessary adjustments can be made. As summarized in the ‘**Implementation**’ section, it is my expectation that FLNR staff will continue to collect information, conduct analyses and monitor changes so that the appropriate forest management adaptations can occur.

Section 8 (8) (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area:

No factors considered under this section require additional comment.

Section 8 (8) (c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities:

This section of the *Forest Act* has been repealed [2003-31-2 (B.C. Reg. 401/2003)].

Section 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 British Columbia:

Minister’s letter and memorandum

Government provided direction regarding the economic and social objectives of the Crown to the chief forester in two letters dated July 4, 2006 and October 27, 2010.

The first letter is dated July 4, 2006 (attached as Appendix 3). In this letter, the minister asked for consideration, during AAC determinations, of the importance of a stable timber supply in maintaining a competitive and sustainable forest industry while being mindful of other forest values. As well, the minister suggested that the chief forester should consider the local social and economic objectives expressed by the public and relevant information received from First Nations.

With respect to the 2006 letter, I note that in the base case as well as in the alternative harvest projections prepared for this determination that a primary objective has been to attain a stable, long-term harvest level where the growing stock is also stable.

The minister, in another letter dated October 27, 2010 provided the Crown’s objectives with respect to mid-term timber supply in areas affected by the mountain pine beetle. Pine is a very minor species in the Fraser TSA and mountain pine beetle has had a very minor impact on stands.

During my consideration of the factors required under Section 8 of the *Forest Act*, I have been mindful of both the local objectives as well as the interests and objectives of First Nations. I have also reviewed the public consultation process undertaken by the district and considered the input received in making my determination. On this basis, I am satisfied that this determination accords with the objectives of province 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 expressed by the public during the timber supply review process, where these objectives are consistent with the government’s broader objectives as well as any relevant information

received from First Nations. In the applicable sections of this document I have provided my consideration of input from the public as well as First Nations.

Section 8 (8) (e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area:

Unsalvaged losses and abnormal infestations

Estimated average annual unsalvaged volume loss due to catastrophic events such as insect epidemics, fires, wind damage or other agents were incorporated into the base case. The unsalvaged losses account for volume that is not expected to be recovered.

District staff indicate that they are monitoring the damage that occurs in younger plantations due to forest health concerns, such as Swiss needle cast and cedar die-back due to summer drought stress. Staff note that if the drought continues to occur in the region, there will be an increase in tree mortality over the next few years, above what was accounted for in the base case.

I have considered the information regarding unsalvaged losses and I am satisfied that unsalvaged volume losses due to catastrophic events are appropriately accounted for in the base case. I acknowledge the concern of district staff regarding the potential impacts on younger plantations from die-back, needle cast and other pathogens as a result of drier climate conditions. Any potential impact to future stand yields is as yet uncertain, but requires monitoring. As indicated in the ‘**Implementation**’ section, it is my expectation that district staff will continue to monitor the health of younger stands, and work with FAIB staff to ensure that any new information is reflected in the next timber supply review for the Fraser TSA.

Reasons for Decision

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

The base case showed that a harvest level of 1 260 000 cubic metres per year could be maintained throughout the forecast period. This level is 24 300 cubic metres, or two percent higher than the level of effective AAC.

In determining AACs, my considerations will typically identify factors which, considered separately, indicate reasons why the timber supply may be either greater or less than the harvest levels projected for various periods throughout 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 risk or uncertainty, but cannot be quantified reliably at the time of the determination and must be accounted for in more general terms.

One factor was identified as a reason why the timber supply projected in the base case may have been overestimated:

- Cutblock adjacency and green up – the application of aspatial adjacency constraints in the base case results in up to a 2.5 percent overestimation across the entire forecast period.

Two factors were identified as reasons why the timber supply as projected in the base case may have been underestimated:

- Merchantability specifications - the differences between operational specifications and what was modelled in the base case results in a small, unquantifiable underestimation in the short-term harvest level;

- Volume estimates for managed stands – the overestimation of the OAF 1 value applied to Douglas-fir leading stands results in up to a two percent underestimation across the entire forecast period.

On balance, the under- and overestimations attributable to the factors described above are not of sufficient magnitude to warrant an adjustment to the base case supplies in the Fraser TSA. However, in my considerations I also noted two areas of significant concern: the harvest of some young stands before their culmination age; and the low level of harvest performance in hemlock- and balsam-leading stands that are assumed to contribute to timber supply.

The harvest of young stands as soon as the timber meets merchantability requirements rather than allowing the stands to realize their full productive potential has the same effect as reducing the productive capacity of a site. And although this practice may provide short-term economic benefits for the licensees, if continued it will reduce the long-term timber supply for the TSA. Given the importance of maintaining a stable local economy beyond the immediate future, I have directed staff to monitor the harvest of young stands and to report this information to me annually (see ‘**Implementation**’). If the practice persists, this information will be used to inform the next timber supply review and AAC determination.

In considering the timber supply risk associated with low harvest performance in hemlock- and balsam-leading stands I am guided by the results of the two sensitivity analyses in which the contribution of hemlock- and balsam-leading stands to the total harvest was decreased. In the first sensitivity analysis, the projected harvest level was 10 percent below the base case level after 20 years. In the second sensitivity analysis, the harvest level was projected to decrease in two seven percent steps after the first 20 years. From this I conclude that if the harvest performance in hemlock- and balsam-leading stands does not increase to the level assumed in the base case the timber supply of the Fraser TSA could be significantly reduced. Given the serious implications associated with this factor, it is my expectation that licensees will begin to harvest hemlock- and balsam-leading stands in proportion to their contribution to the THLB so that the reasonableness of including these stands in the THLB can be re-evaluated prior to the next AAC determination.

However, if over the term of this determination, licensees demonstrate an appropriate level of performance in old hemlock- and balsam-leading stands and align practices in younger stands to support stands reaching culmination age, and there are no significant reductions in the projected timber supply due to other factors, it is possible that an increase to the AAC could be considered in the next determination for the Fraser TSA.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the TSA by establishing an AAC of 1 235 700 cubic metres.

This determination is effective February 18, 2016, and will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the 10 years required by legislation.

Implementation

In the period following this decision and leading to the subsequent determination, I encourage FLNR staff, licensees and other major project proponents to undertake or support 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 all parties to undertake or support these projects is dependent on provincial priorities and available resources, including funding. However, these projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Fraser TSA.

- I request that staff work with licensees to review the current operability information and, if necessary revise the information to reduce uncertainty about the size of the operable land base;
- I request that staff collect information to support to increase the reliability of managed stand yield estimates and the estimation of future stand yields for the Fraser TSA;
- I expect district staff to work in collaboration with licensee staff to monitor harvesting practices and the extent to which stands are harvested before they reach culmination age, in order to avoid compromising long-term timber supply;
- I encourage district staff to develop a planning-level karst inventory for areas of high karst occurrence so as to ensure better information regarding these resources is available for the next timber supply review, and to work with licensees to make sure site plans reflect proper stewardship for karst areas;
- I encourage district staff to work with provincial experts to update the information for designated community watersheds so as to gain additional information to support assumptions;
- I expect staff to monitor harvest performance in old hemlock- and balsam-leading stands so as to determine if performance is aligned with the expected contribution of these stands to timber supply over time.
- I request that staff work to ensure that the spatial information regarding cultural values associated with the S'ólh Téméxw Use Plan informs operational decisions, and as well that the location of these values are used as foundational areas when considering placement of reserves to protect other resource values, including visuals;
- I expect staff to continue to monitor plantations for impacts from needle cast or other pathogens and as well ensure any expected impacts to future stand volumes is appropriately reflected in the next timber supply review.



Diane Nicholls, RPF
Chief Forester

February 18, 2016



Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to January 27, 2016), 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 the Crown land in the following areas:

- (i) tree farm licence areas;
- (ii) community forest agreement areas;
- (iii) first nations woodland licence areas;
- (iv) 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 that portions of the allowable annual cut are attributable to one or more of the following:

(a) different types of timber or 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;

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

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

(6) The minister must determine an allowable annual cut for each woodlot licence area, in accordance with the woodlot licence for that area.

(7) The minister must determine an allowable annual cut for

(a) each community forest agreement area in accordance with the community forest agreement for that area, and

(b) each first nations woodland licence area in accordance with the first nations woodland licence for that area.

(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.

(9) Subsections (1) to (4) of this section do not apply in respect of the management area, as defined in section 1 (1) of the ***Haida Gwaii Reconciliation Act***.

(10) Within one year after the chief forester receives notice under section 5 (4) (a) of the ***Haida Gwaii Reconciliation Act***, the chief forester must determine, in accordance with this section, the allowable annual cut for

(a) the Crown land in each timber supply area, except the areas excluded under subsection (1) (a) of this section, and

(b) each tree farm licence area

in the management area, as defined in section 1 (1) of the ***Haida Gwaii Reconciliation Act***.

(11) The aggregate of the allowable annual cuts determined under subsections (6), (7) and (10) that apply in the management area, as defined in section 1 (1) of the ***Haida Gwaii Reconciliation Act***, must not exceed the amount set out in a notice to the chief forester under section 5 (4) (a) of that Act.

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

Section 4 of the *Ministry of Forests and Range Act* (current to January 27, 2016) 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 sectorin 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



JUL 04 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.

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Minister of
Forests and Range
and Minister Responsible
for Housing

Office of the
Minister

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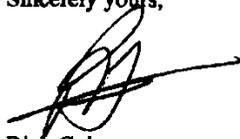
Jim Snetsinger

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.

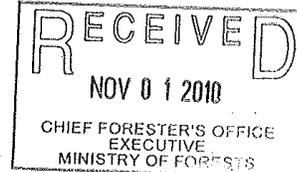
You should also consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

Sincerely yours,

A handwritten signature in black ink, appearing to be 'Rich Coleman', with a long horizontal stroke extending to the right.

Rich Coleman
Minister

Appendix 4: Minister's letter of October 27, 2010



File: 280-30/MPB
 Ref: 126097

OCT 27 2010

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

Dear Mr. Snetsinger:

Re: Economic and Social Objectives of the Crown Regarding Mid-Term Timber Supply in Areas Affected by the Mountain Pine Beetle

On July 4, 2006, Rich Coleman, former Minister of Forests and Range, wrote to you outlining the social and economic objectives of the Crown for AAC determination (in accordance with Section 8 of the *Forest Act*) with respect to issues associated with the Mountain Pine Beetle (MPB) epidemic. The aforementioned letter articulated the Crown's objectives of ensuring 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. I am writing to you regarding the Crown's objectives with respect to mid-term timber supply in areas affected by the mountain pine beetle.

The MPB infestation has had a profound impact on the timber supply outlook for the interior of the province. In particular, forecasts of timber supply in the mid-term—the period between the ending of the economic shelf life of killed pine and the time when the forest has re-grown and again become merchantable—are now significantly lower than prior to the infestation. These shortages threaten the wellbeing of forest-dependent cities and towns. The

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Ministry of Forests and Range and
 Minister Responsible for Integrated
 Land Management Bureau

Minister's Office

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Jim Snetsinger, Chief Forester

Government of British Columbia is working closely with beetle action committees, municipalities, and the private sector to diversify economies. However, for many forestry-dependent towns mid-term timber supply shortages could still have significant socio-economic impacts.

During this challenging time it will be necessary to reassess management objectives and administrative approaches that were developed when forest conditions in the province's interior were very different than now exist. In this reassessment it will be important to enhance the understanding of how best to balance objectives for non-timber forest values with objectives for timber supply to achieve a range of socio-economic benefits. It will also be important to assess how innovative practices and incremental silviculture could mitigate mid-term timber supply shortfalls in MPB affected areas, and if flexibilities can be found in timber supply administration.

During the Timber Supply Review process, in addition to the considerations included in the July 2006 letter, I would like you to undertake analysis that can provide information on how changes to current management practices and administration could increase mid-term timber availability in MPB-affected areas. This information should be shared with Ministry of Forest and Range Executive and used to inform discussions among interested parties, and considered by appropriate land use and management decision makers. If formal changes are made to management objectives and administration, you will be in a position to incorporate those changes in Timber Supply Reviews and AAC determinations.

Sincerely,



Pat Bell
Minister

pc: Dana Hayden, Deputy Minister