

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

# **100 Mile House Timber Supply Area**

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

**Effective November 7, 2013**

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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 100 Mile House 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 100 Mile House Natural Resource District, the Cariboo Region, and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to the local residents, First Nations, forestry consultants and licensees 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 timber supply areas (TSAs) and tree farm licences. In addition to the chief forester, Section 23 (3) of the *Interpretation Act* expressly authorizes the deputy chief forester to carry out the functions of the chief forester, including those required under Section 8 of the *Forest Act*. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document.

## **Description of the 100 Mile House TSA**

The 100 Mile House TSA is located in south-central British Columbia. The TSA is bounded on the west by the Fraser River, on the east by the Cariboo Mountains and Wells Gray Provincial Park and Tree Farm Licence 18, on the north by the Williams Lake TSA, and on the east and south by the Kamloops TSA.

The boundary of the TSA includes: several protected areas and parks; private land, Indian Reserves, and area-based tenures, such as community forests, woodlots and First Nations woodland licences. These areas do not contribute to the TSA timber supply. The total area of the 100 Mile House TSA is about 1.24 million hectares of which about 840 000 hectares are forested Crown land, parks and protected areas. After all other resource requirements have been accounted for, about 670 000 hectares are considered available for timber harvesting.

The 100 Mile House TSA has varied topography and climate. The flat, dry interior plateau separates two mountain ranges – the Marble Range to the southwest and the Quesnel Highlands to the northeast. The western part along the Fraser River has a hot, dry climate while the Cariboo Mountains to the east have a wetter climate and steep slopes.

The dominant tree species in the TSA are lodgepole pine and Douglas-fir. Several other tree species occur including: spruce, subalpine fir (balsam), western redcedar, western hemlock and various deciduous (hardwood) species.

The 100 Mile House TSA provides habitat for a wide variety of wildlife including: mule deer, moose, black bear, lynx, marten, owls, as well as many fish species. Species at risk in the TSA include: mountain caribou, grizzly bear, bighorn sheep, and the prairie falcon.

The forests of the 100 Mile House TSA are very diverse and provide a wide range of resources including: timber, forage, non-timber forest products, and habitat for fish and wildlife. Residents and tourists enjoy outdoor recreation activities such as cross-country skiing, snowmobiling, mountain biking, hiking, camping, fishing and hunting.

The main communities within the TSA are 100 Mile House, 108 Mile Ranch and Clinton. Smaller communities include: Lac la Hache, Forest Grove, 70 Mile House, Lone Butte and Bridge Lake. The combined population within and surrounding these communities is approximately 23,000.

There is a rich, diverse aboriginal history in the 100 Mile House TSA. Three First Nations' communities, which are home to the Tsq'escen First Nation (Canim Lake Indian Band), Stswecem'c Xgat'tem First Nation (Canoe/Dog Creek Indian Band) and Llenlleyen'ten (High Bar) First Nation, are physically located within the TSA. Other First Nations whose traditional territories overlap the 100 Mile House TSA include: the Bonaparte Indian Band; Tk'emlups Indian Band; Williams Lake Indian Band; Tsilhqot'in Nation; St'at'imc Nation; Ts'kw'aylaxw First Nation; T'it'q'et Administration; Oregon Jack Creek Band; Skeetchestn Indian Band; Lytton First Nation; Nlaka'pamux Nation Tribal Council; Nicola Tribal Association; Simpcw First Nation; Ashcroft Indian Band; Coldwater Indian Band; Esketemc First Nation; Siska Indian Band; Bridge River Indian Band and Cook's Ferry Indian Band.

Based on the report entitled *Economic Dependency Tables for Forest Districts* (2006), the forest sector accounts for 26 percent of total basic employment in the 100 Mile House Natural Resource District. Other sectors providing employment in the district include: public sector (26 percent); tourism (16 percent); construction (16 percent); agriculture and food (8 percent); and mining and mineral production (2 percent).

## **History of the AAC**

From 1981 to 1995, the AAC for the 100 Mile House TSA was 1 250 000 cubic metres. From 1996 to 2001, the AAC was 1 362 000 cubic metres including a partition of 112 000 cubic metres for 'problem' forest types. In 2002, the AAC was set at 1 334 000 cubic metres. The 'problem' forest types previously identified were included in the timber supply and the partition was not continued after 2002. In 2006, following an expedited timber supply review in response to the mountain pine beetle (MPB) epidemic, the chief forester increased the AAC to 2.0 million cubic metres. The chief forester indicated that it was his expectation that 90 percent of the total harvest volume originate from stands with 70 percent or more pine.

Table 1 shows the apportionment of the AAC by the Minister of Forests, Lands and Natural Resource Operations, effective March 14, 2007.

Table 1. *Apportionment of the AAC*

<b>Apportionment</b>	<b>Volume (m<sup>3</sup>)</b>	<b>% of AAC</b>
Forest Licences Replaceable	802 782	40.1
Forest Licences Non-Replaceable	513 897	25.7
BCTS Timber Sale Licences	456 071	22.8
Pulpwood Agreement TSL	112 000	5.6
Community Forest Agreements	20 000	1.0
Woodlot Licences	20 000	1.0
Forest Service Reserve	5 250	0.3
FSR Small Scale Salvage	70 000	3.5
<b>Total</b>	<b>2 000 000</b>	<b>100.0</b>

### **New AAC determination**

Effective November 7, 2013, the new AAC for the 100 Mile House TSA will be as follows:

- From November 7, 2013 to November 7, 2018, the AAC will be 2 000 000 cubic metres, of which no more than 500 000 cubic metres are attributable to live trees.
- From November 7, 2018 until the next determination, the AAC will be 1 000 000 cubic metres, of which no more than 500 000 cubic metres are attributable to live trees.

Legislation requires a new AAC determination within 10 years of the effective date of this determination. However, I expect that this determination may need to be revisited in approximately five years once new information is available from harvest performance monitoring and other actions described below in ‘**Implementation**’. Annual reporting and recommendations from the district will inform the decision about when to initiate the next timber supply review.

### **Information sources used in the AAC determination**

- *Forest and Range Practices Act*, current to October 23, 2013;
- *Forest Act*, current to October 23, 2013;
- *Ministry of Forests and Range Act*, current to October 23, 2013;
- *Forest Practices Code of British Columbia Act*, and guidebooks, January 31, 2004;
- *Cariboo-Chilcotin Land Use Plan* approved by government on October 24, 1994;
- *Cariboo-Chilcotin Land Use Order* issued under the *Land Act*, May 19, 2010 and amended April 18, 2011;
- *Cariboo-Chilcotin Land Use Plan Integration Report*, April 6, 1998;
- *100 Mile House Sustainable Resource Management Plan*, August 10, 2005;

- *100 Mile House Forest District Enhanced Retention Strategy For Large Scale Salvage of MPB Impacted Stands*, Version 1.1, 2007;
- *100 Mile House TSA Enhanced Type 2 Silviculture Strategy*, Cortex Consultants, March 2009;
- *Guidance on Landscape- and Stand-Level Structural Retention on Large-Scale MPB Salvage Operations*, Jim Snetsinger, Chief Forester, December 2005;
- *Regional Biodiversity Conservation Strategy*, Update Note #8, Strategy for Management of Mature Seral Forest and Salvage of MPB-Killed Timber, December 2004;
- *Government Actions Regulation (GAR) Order for Ungulate Winter Range #U-5-003* issued December 13, 2004 and amendments issued February 20, 2007;
- GAR Order establishing General Wildlife Measures issued in 2007;
- *Procedures for Factoring Visual Resources into Timber Supply Analyses*, Ministry of Forests, March 17, 1998;
- Bulletin — *Modelling Visuals in Timber Supply Review III*, Ministry of Forests, December 12, 2003;
- *Methods to Estimate Unsalvaged Losses for Timber Supply Reviews*. Henigman, John. British Columbia Ministry of Forests, Forest Practices Branch, Victoria, BC. 2000;
- *British Columbia Local Area Economic Dependencies*. Gary Horne, BC Stats, March 2009;
- *Provincial-Level Projection of the Current MPB Outbreak: Update of the infestation projection based on the 2010 Provincial Aerial Overview of Forest Health and the BC MPB model (year 8)*. Walton, Adrian. BC Ministry of Forests, Lands and Natural Resource Operations, Forest Analysis and Inventory Branch, June 22, 2011;
- *Stream/Riparian Classification*. Wildstone Resources Ltd. 1997;
- *100 Mile House Timber Supply Area, Analysis Report*. British Columbia Ministry of Forests, July 2001;
- *100 Mile House Timber Supply Area Rationale for Allowable Annual Cut (AAC) Determination*; British Columbia Ministry of Forests, January 1, 2002;
- *Urgent Timber Supply Review for the 100 Mile House Timber Supply Area — Public Discussion Paper*, British Columbia Ministry of Forests and Range, April 2006;
- *100 Mile House Timber Supply Area Rationale for Allowable Annual Cut (AAC) Determination*, British Columbia Ministry of Forests and Range, September 6, 2006;
- *100 Mile House Timber Supply Area Timber Supply Review Data Package*. British Columbia Ministry of Forests, Lands and Resource Operations, January 2012;
- *100 Mile House Timber Supply Area Timber Supply Analysis Public Discussion Paper*; British Columbia Ministry of Forests, Lands, Natural Resource Operations, January 2013;
- Letter from the Minister of Forests and Range to the Chief Forester stating the economic and social objectives of the Crown, July 4, 2006;

- Letter from the Minister of Forests and Range to the Chief Forester stating the economic and social objectives of the Crown regarding mid-term timber supply in areas affected by the MPB, October 27, 2010;
- Letter from the Assistant Deputy Minister, Tenures and Revenue Division, Ministry of Forests and Range to all licensees concerning cut-control changes resulting from new log grades, February 24, 2006;
- *First Nations Consultation Summary related to the 100 Mile House Timber Supply Area Allowable Annual Cut Determination*, 100 Mile House Natural Resource District, May 2013;
- *Updated Procedures for Meeting Legal Obligations When Consulting First Nations – Interim*, Province of British Columbia; May 7, 2010;
- *Growing Fibre, Growing Value*. Special Committee of the BC Legislature on Timber Supply. August 2012;
- *Beyond the Beetle: A Mid-term Timber Supply Action Plan*, Ministry of Forests, Lands and Natural Resource Operations. October 2012; and
- Technical review and evaluation of current operating conditions on the 100 Mile House Timber Supply Area through comprehensive discussions with staff from the Ministry of Forests, Lands and Natural Resource Operations, including the AAC determination meeting held in 100 Mile House, BC on May 22 and 23, 2013.

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

Furthermore, computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Technical information and analysis; therefore, do not necessarily provide the complete answers or solutions to forest management decisions such as AAC determinations. Such information does provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information I must consider in AAC determinations.

In determining this AAC for the 100 Mile House 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 timber supply areas and tree farm licences.

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 foresters, 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 ongoing 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 judgement 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 ongoing 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

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' interests are addressed through specific actions and forest practices.

Aboriginal interests that may be impacted by AAC decisions will be addressed 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 obligations under court decisions 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 forecasts provided to me through the work of the Provincial Timber Supply Review Program 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" forecast and forms the basis for comparison when assessing the effects of uncertainty on timber supply. The base case is designed to reflect current management practices.

Because 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 forecast 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 forecast 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 forecast. 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 100 Mile House TSA**

The current AAC was determined in 2006 following an urgent timber supply review to address the rapid expansion of the MPB infestation. Pine mortality peaked in 2006 and recent forecasts and surveys have confirmed that the MPB infestation has collapsed. Although there is no significant new infestation, large volumes of dead pine have accumulated and have been the focus of accelerated salvage harvesting. This timber supply analysis addresses the ongoing salvage harvest and the transition to lower mid-term harvest levels. In timber supply reviews for management units severely impacted by MPB, “mid-term” refers to that portion of a harvest forecast when dead pine is no longer an economically-viable source of timber and before regenerating pine stands reach harvestable condition again.

The Standard Timber Supply Model (StTSM), which is a Spatially Explicit Landscape Event Simulator (SELES)-based model, was used for this timber supply analysis. StTSM is approved for use in timber supply analysis by the Forest Analysis and Inventory Branch (FAIB) and the results of the analysis were peer reviewed.

Although StTSM has spatial capabilities which can track the geographic locations of harvest areas, the base case model did not simulate harvest block patterns or spatial constraints, such as adjacency. The model was set to examine spatial forest inventory data as a one-hectare grid and grouped adjacent eligible one-hectare blocks. Spatial constraints such as adjacency were accounted for with an aspatial limit on the total area recently harvested within each landscape unit. Although it is neither practical nor necessary to model operational blocks to support a strategic-level decision such as an AAC, this modelling approach likely provides more harvest flexibility than could be achieved operationally. This increased flexibility likely results in a

small, unquantified overestimation in the base case, and I will account for this in my determination, as discussed in '**Reasons for Decision**'.

The base case modelled the current practice of accelerated harvesting that attempts to maximize the salvage of dead timber volume and minimize non-recoverable losses. For the base case, it was assumed that dead pine trees retain commercial value until fifteen years after being killed by MPB. Stands were prioritized for harvest in the following order: stands with more than 70 percent pine and with more than 50 percent mortality (primary salvage); stands with 50 to 70 percent pine and more than 50 percent mortality (secondary salvage); stands with more than 70 percent spruce in areas of spruce bark beetle infestation (spruce salvage); and then all other species and/or stands with less than 50 percent mortality.

Starting in 2012, the initial harvest level in the 150-year base case was set at 2.0 million cubic metres per year. This rate, which is the level of the AAC determined in 2006, can be maintained for seven years. After 2019, the harvest level decreases to 890 000 cubic metres per year and remains at this level for 48 years (2067), after which it begins to increase to the long-term sustainable level of 1.6 million cubic metres per year in 2086. One-year time steps were used for the first decade in the base case and five-year time steps were used thereafter.

During the first seven years in the base case, about 500 000 cubic metres per year are attributable to trees assumed to be alive at the time of harvest. The remaining 1.5 million cubic metres per year are attributable to the salvage of dead pine, dead spruce and incidental harvest of live trees within the salvaged stands. Beyond seven years, salvage opportunities diminish as the remaining killed pine has been dead for more than 15 years. The mid-term harvest level of 890 000 cubic metres per year is initially supported by the remaining salvageable stands and then by the available mature stands which were not killed by beetles. Later in the mid-term, the harvest transitions to existing, managed stands that have regenerated following harvest over the last 50 years and then to future, managed stands that regenerate following current and projected harvesting.

I have reviewed: the assumptions and methodology incorporated in the base case, the alternative harvest flows and the sensitivity analyses. Based on my review, I am satisfied, subject to the qualifications accounted for in various sections of this document, that the information presented to me provides a suitable basis from which I can assess the timber supply for the 100 Mile House TSA.

### **Consideration of factors as required by Section 8 (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 appropriately represents current management or the best available information, and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 2.

Table 2. List of factors accepted as modelled

<b>Forest Act section and description</b>	<b>Factors accepted as modelled</b>
8(8)(a)(i) Composition of the Forest	<ul style="list-style-type: none"> <li>• land classified as non-forest</li> <li>• parks, goal 2 protected areas &amp; recreation sites</li> <li>• areas considered inoperable</li> <li>• sites with low timber growing potential</li> <li>• wildlife habitat areas</li> <li>• recreation trails</li> </ul>
8(8)(a)(i) Expected rate of growth	<ul style="list-style-type: none"> <li>• aggregation procedures</li> <li>• deciduous- and mixed-stands</li> <li>• existing and future managed stand yields</li> <li>• minimum harvest criteria</li> <li>• harvest rules and harvest flow objectives</li> </ul>
8(8)(a)(ii) Expected time for the forest to be re-established following denudation	<ul style="list-style-type: none"> <li>• impediments to regeneration</li> </ul>
8(8)(a)(iii) Silvicultural treatments to be applied	<ul style="list-style-type: none"> <li>• genetic gains</li> <li>• fertilization, spacing and thinning</li> </ul>
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	<ul style="list-style-type: none"> <li>• decay, waste and breakage</li> </ul>
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for other purposes	<ul style="list-style-type: none"> <li>• Cariboo-Chilcotin Land Use Plan</li> <li>• community watershed management</li> <li>• wildlife management</li> <li>• visual quality management</li> <li>• stand-level biodiversity</li> <li>• landscape-level biodiversity</li> </ul>
8(8)(a)(vi) Other information	---
8(8)(b) Short and long-term implications of alternative rates of timber harvesting from the area	---
8(8)(d) Economic and social objectives of the government	---
8(8)(e) Abnormal infestations and salvage programs	<ul style="list-style-type: none"> <li>• other bark beetles</li> </ul>

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 subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider**

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

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

Land base contributing to timber harvesting

*- general comments*

The total area of the 100 Mile House TSA, as reported in the analysis report, is 1 237 626 hectares of which 839 789 hectares are forested Crown land, parks and protected areas. Within this area, 670 372 hectares are considered available for timber harvesting.

As part of the process used to define the timber harvesting land base (THLB), a series of deductions was made from the Crown forest land base. 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 the AAC rationale does not necessarily reflect the total area with that classification; some portion of it may have been deducted earlier under another classification.

For the 100 Mile House TSA, I accept that the above approach was used appropriately in the timber supply analysis.

*- forest inventory*

Most of the forest inventory used in the base case was completed in 1972 and 1976 and then updated annually to reflect growth and depletion. About 17 percent of the TSA was re-inventoried to Vegetation Resource Inventory (VRI) standards in 1998. All remaining inventory data were converted to VRI standards in 2003.

Public input included two comments about the forest inventory. One comment expressed a general concern that the inventory was inadequate to enable an informed timber supply review. FAIB staff inform me that the inventory meets the provincial VRI standards and is considered suitable for use in a timber supply review.

The other comment suggested that a history of “high-grading” has left forests in poorer condition than shown in the inventory label. District staff indicate that although there was some intermediate utilization logging in the 1970’s, the area involved was relatively small. In addition, staff acknowledge that the correlation between the inventory labels associated with dry belt Douglas-fir uneven-aged stands and actual stand conditions is poor due to the complex structure of these stands. They expect that the new inventory that is currently underway will help improve the information available for these stands.

Due to the uncertainty surrounding timber supply in the wake of the MPB infestation, I requested that a timber supply review be initiated for the 100 Mile House TSA to support an AAC determination earlier than the 10 years required in Section 8 of the *Forest Act*. Although the inventory is dated, I decided that it was not prudent to delay my determination to await completion of the inventory currently in progress. On this basis, I accept that the inventory information used in the base case is the best available and is adequate for use in my determination. In any event, I expect that the new inventory will be incorporated in the next timber supply review, which I expect may need to occur in about five years after information

from harvest performance monitoring and the other actions described below in ‘**Implementation**’ is available, as discussed in ‘**Reasons for Decision**’.

*- area based tenures*

The base case excludes the areas associated with two new tenures that were expected to be issued prior to this AAC determination. However, at this time, the new 20 000-cubic metre per year community forest agreement (about 65 446 hectares) and 2000-cubic metre per year woodlot licence (about 1200 hectares) have not been issued. Therefore, these areas still contribute to the timber supply of the TSA and should have been included in THLB used in the base case. On this basis, I conclude that the base case timber supply has been underestimated by 22 000 cubic metres per year and I will account for this as discussed in ‘**Reasons for Decision**’.

*- existing and future roads, trails and landings*

Loss in productive forest land due to existing roads, trails, and landings was estimated based on road mapping and an assumption of a typical road width. The reduction averaged 2.25 percent across the Crown forest land base (CFLB).

Future roads, trails and landings were accounted for through a one-percent reduction in productive forest area that was applied after stands were harvested for the first time in the model. This reduction was limited to hectares within the THLB without existing roads that are not adjacent to a hectare with an existing road. The one-percent reduction was based on historic road information.

District staff note that a review of cutting permits issued over the last five years indicates that road density has increased by up to twice the historic level and are concerned that if this practice continues, more area will be alienated from timber production.

For this determination, I accept that the base case appropriately accounted for existing roads, trails and landings. However, based on the information provided by the district, I agree that the use of historic road information to estimate the effect of future road development did not account for the significant increase in road density observed over the most recent five-year period. On this basis, I conclude that the base case long-term timber supply has been overestimated by a small, unquantified amount and I will account for this as discussed in ‘**Reasons for Decision**’.

I am also concerned that if this trend of increasing road density continues, the increased alienation of productive forest land will negatively impact future timber supply and potentially adversely affect wildlife. I request that district staff continue to monitor road density and that this information be used to inform the next AAC determination, as discussed under ‘**Implementation**’.

*- non-commercial cover*

In the base case, juniper-, whitebark pine- and cottonwood-leading stands were assumed to be unsuitable for timber production and were excluded from the THLB. However, aspen- and birch-leading stands are being harvested in the TSA and were, therefore, included in the THLB. Aspen is considered a managed species within the TSA representing about one-percent of the scaled volume reported in the ministry’s Harvest Billing System.

The base case shows that deciduous-leading stands contribute on average 85 000 cubic metres per year or 9.6 percent of the projected mid-term harvest levels. A sensitivity analysis in which all deciduous volume was excluded from the harvest resulted in 16 percent and 11 percent decreases in the mid- and long-term harvest levels, respectively.

District staff maintain that a significant amount of the area classified as deciduous-leading in the inventory is likely mixed conifer and deciduous stands. They maintain that stands classified as deciduous leading at the time of a free-growing survey are developing into mixed stands in later years.

Input from a licensee acknowledges that harvesting needs to focus on dead pine in the short term but recommends that the chief forester take steps in the future to recognize the importance of the deciduous contribution and consider a deciduous partition in the next AAC determination. District staff note that harvest performance in deciduous stands is reasonable considering the current focus on dead pine salvage and suggest that a deciduous partition is not required to encourage utilization.

I accept the inclusion of aspen- and birch-leading stands in the THLB and the exclusion of juniper-, white-bark pine- and cottonwood-leading stands from the THLB. In recognition of the significant contribution of deciduous species to the mid-term timber supply and given the potential inaccuracies in the classification of deciduous stands in the forest inventory, I request that district and FAIB staff use the results of the new inventory, along with harvest performance information to better understand the actual deciduous inventory and its potential contribution to the mid-term timber supply and I have noted this under '**Implementation**'.

*- old growth management areas*

Old growth management areas (OGMA) were established for the TSA under the Cariboo-Chilcotin Land Use Plan Order. Old growth management areas are areas where harvesting is restricted in order to maintain landscape-level biodiversity. Under certain circumstances, including the need for sanitation harvesting to control the spread of insect infestations, harvesting may be permitted in these areas.

In the base case, OGMAs classified as "permanent" or "rotating" were excluded from the THLB. "Transitional" OGMAs only exist until older forests are available for retention or until 2030, at which time they will be available for harvest. These areas were not modelled as THLB exclusions (see *landscape-level biodiversity*). The base case assumed that up to 10 percent of permanent and rotational OGMAs may have salvage harvesting and; therefore, included 7859 hectares of OGMAs in the THLB. Net of other factors, this inclusion represents approximately one percent of the THLB.

During discussions with district and regional staff, it was noted that since the collapse of the MPB infestation, sanitation harvesting is no longer current practice and that OGMAs should no longer be assumed to contribute to the THLB. I agree with staff and conclude that the inclusion of 10 percent of permanent and rotational OGMAs in the THLB results in a one percent overestimation in the base case short-term timber supply and I will account for this in '**Reasons for Decision**'.

*- riparian areas*

Comprehensive riparian classification mapping is not available for the 100 Mile House TSA. In order to account for riparian values in the absence of comprehensive riparian classification mapping for the 100 Mile House TSA, the estimated reductions of 1.3 percent for riparian reserves and 0.7 percent for lakeshore management zones used in the 2001 analysis were used in the base case.

First Nations have expressed concerns regarding the cumulative impact of timber harvesting on key values such as fisheries and fresh water supplies. The *Tsq'escnem'c Canim Lake Band Forest Stewardship Retention Plan for Snine Forest* developed by the Canim Lake Indian Band (CLIB) includes ways to mitigate adverse impacts on these values. During consultation, the CLIB requested that four watersheds be closed to further harvesting due to the risk of adverse hydrological impacts. They also requested that the riparian buffers around all First Nations food fisheries (most of the lakes in their asserted territory), as well as any fish-bearing creeks and rivers, be increased. The Skeetchestn Indian Band requested increased riparian reserve zones in the Deadman River Watershed.

District staff inform me that some major licensees acknowledge the *Tsq'escnem'c Canim Lake Band Forest Stewardship Retention Plan for Snine Forest* in their forest stewardship plans, indicating that they will work with the CLIB at an operational level to address their interests. In some areas this collaboration has resulted in an increase in riparian buffers in harvested areas. On a limited basis, widening of riparian buffers in a few areas likely does not have a significant effect on harvesting in other areas. However, if this practice becomes more widespread such that a significant amount of area that is legally available for timber harvesting no longer contributes to timber supply, this practice could result in over-harvesting in other areas of the TSA.

I accept that the riparian reserve and lakeshore management zone assumptions used in the base case reflect the best available information and are adequate for use in my determination. However, prior to the next determination, I request that district staff improve the riparian classification information and monitor the extent to which increased retention is occurring in riparian areas. This information is to be used to inform the assumptions used in subsequent timber supply reviews, as noted in **'Implementation'**.

With regard to the concerns expressed by the CLIB and the Skeetchestn Indian Band, I note that timber supply reviews and AAC determinations are focused on the overall rate of allowable harvests, not on the timing and location of specific harvests. For the purposes of an AAC determination, it is assumed that all areas suitable for timber production that have not been excluded by government from timber harvesting through the issuance of legal orders can contribute to timber supply. Within this area, licensees are able to harvest timber provided the applicable legal requirements (e.g., *Forest and Range Practices Act*) are met. The best way to increase the confidence that a particular value in a particular location is protected is to define and formalize a management regime for the value that must be incorporated into forest operations. If that is done, the information can be incorporated into the timber supply review process and AAC determination.

For this determination, I encourage district staff and licensees to continue to work with the CLIB and the Skeetchestn Indian Band to address the concerns described above.

### Expected rate of growth

#### *- natural stand yields*

Yield curves for natural stands were generated using the Variable Density Yield Prediction model version 7 (VDYP7), the provincial growth model, for every stand in the inventory.

A licensee expressed concern that the natural stand yields in the inventory are underestimated, particularly in interior Douglas-fir stands. However, no alternative natural stand yield data were provided for my consideration. Based on my review of a sensitivity analysis, in which a 10 percent increase in all natural stand yields resulted in a 11 percent increase in the base case harvest levels, I conclude that underestimation of the natural stand yields could have a significant

effect on the mid-term timber supply. However, in the absence of alternative information, I accept that the natural stand yields used in the base case reflect the best available information and I will make no adjustment to the base case on this account. For the next determination, I encourage the licensee to provide FAIB with data and analysis information to support their concerns regarding the natural stand yields used in the timber supply analysis.

*- site productivity*

The site productivity information used to create the managed stand yield curves used in the base case relied on site index estimates that relate site productivity to biogeoclimatic ecosystem classification and leading species (SIBEC). This information was reviewed by FLNR experts, who concluded that the SIBEC estimates were statistically reliable and appropriate for use in a timber supply review. Where SIBEC estimates were not available (e.g., some of the less common ecosystem site series) the forest inventory site index was used instead.

New provincial site productivity mapping has recently been completed but was not available in time to be used in this timber supply analysis. FLNR staff advise that using the new provincial site productivity mapping, largely based on the same SIBEC estimates, would probably result in a minor increase in average site index across the TSA, since only the less common site series would have improved site index compared to using SIBEC alone.

I accept that use of the new provincial site productivity mapping would likely result in an increase in average site index and on this basis I conclude that the base case long-term harvest level has likely been underestimated by a small, unquantified amount and I will account for this in my determination as discussed in '**Reasons for Decision**'.

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

Expected time to re-established the forest following denudation

*-stand regeneration*

Based on a review of free-growing survey data, all harvested stands in the base case were assumed to be re-established one to three years following harvest. However, in MPB-affected stands, the dead pine component was assumed to no longer contribute to timber supply.

District staff reviewing the analysis, indicate that in practice unsalvaged MPB-affected stands often regenerate naturally and continue to contribute to timber supply.

At present, information about the acceptability and growth of regenerating unsalvaged dead pine stands in the 100 Mile House TSA is unavailable. FAIB staff are establishing monitoring plots throughout TSAs that have been heavily impacted by MPB in order to improve understanding of regeneration and growth in post-MPB attacked stands.

With the exception of unsalvaged dead pine stands, I accept the regeneration assumptions used in the base case. However, I conclude that not accounting for the natural regeneration of unsalvaged dead pine stands represents an unquantified underestimation in the base case long-term harvest level and I will account for this in my determination as discussed in '**Reasons for Decision**'.

*- not sufficiently restocked*

Lands classified in the VRI as “not satisfactorily restocked (NSR)” were included in the THLB. Areas identified as current NSR in RESULTS were assumed to regenerate within one to three years after harvest.

District staff indicate that although the data reported in the RESULTS database indicates that all NSR area in the 100 Mile House TSA is fully restocked, no performance monitoring information is available to confirm the reliability of the data. Staff also note that there is often a significant lag between stand harvesting and the entry of information into the RESULTS database.

Based on a review of RESULTS information, stocking status reports and a district silviculture files, a total of 1132 hectares were identified as “backlog” NSR (pre-1987). A *Forests for Tomorrow* project is currently underway to inventory backlog NSR. The preliminary results suggest that about half of the backlog NSR area in the 100 Mile House TSA can be declared free growing this year. The remaining backlog NSR is expected to be treated and declared free growing by 2015. Consequently, in the base case all backlog NSR was assumed to contribute to the THLB.

I accept that the NSR assumptions used in the base case represent the best available information and are adequate for use in this determination. However, in the absence of performance monitoring information, I am unable to assess the reliability of the RESULTS data. Therefore, prior to the next AAC determination, I request that district staff monitor actual regeneration performance so that they will be able to provide me with a reasonable level of confidence in the restocking rates, as described in ‘**Implementation**’. I also want to acknowledge the important role that licensees have in providing prompt and accurate reports to the RESULTS database.

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

Silvicultural treatments

*- silvicultural systems*

There are two primary silviculture systems in use within the 100 Mile House TSA: clearcut with reserves in all stands that are not Douglas-fir leading, and variable retention in Douglas-fir leading stands.

In the base case, a seven percent area reduction was applied to all stands harvested using clearcut with reserves. This estimate was based on information provided by the ministry’s *Forest and Range Evaluation Program*. District staff indicate that work is currently underway to standardize silvicultural systems for use in interior Douglas-fir stands. In order to reflect the current diversity of approaches in the base case, stands harvested in the model using variable retention systems were subject to a variety of area reductions following initial harvest.

I accept that the information used in the base case uses the best available information and is appropriate for use in this determination. I encourage the group developing standardized approaches to silvicultural systems for use in Douglas-fir leading stands to complete this work and then confirm whether the new approach reflects current practice to inform the next timber supply review. I have noted this in ‘**Implementation**’.

**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

*- log grade adjustments*

In April 2006, new log grades were implemented for the BC interior. Previously, a log was assessed according to whether the tree it came from was alive or dead at the time of harvest. Prior to April 2006, grade 3 endemic (the 'normal' mortality observed in a mature stand) and grade 5 (dead tree with less than 50 percent firmwood and/or defects making the log unsuitable for lumber) were referred to as 'dead potential' and were not charged to the licensee's AAC if harvested. Under the new system, grades are based on log size and quality at the time it is scaled and all logs that meet merchantability specifications will be charged to cut control regardless whether the tree they originate from was alive or dead at the time of harvest.

Dead potential volume was not assumed to be part of the AAC in previous timber supply reviews so, as a transitional measure, species adjustment factors were implemented to reduce the volume charged to cut control to reflect the expected dead potential volumes. District staff state that if this timber supply review includes consideration of dead potential, they will request repeal of the species adjustment factors within the 100 Mile House TSA.

Dead potential volumes are not included in the VRI estimates of timber volume used in the base case. Consequently, dead potential volume is not included in the base case harvest levels. A number of possible sources of data about dead potential volume exist, including: inventory audit plots, VRI ground samples, permanent sample plots and temporary sample plots. The estimate of dead potential volume from these sources varies considerably.

Based on my review of this information, I agree with staff that the best estimate of dead potential volumes is the average volume removed from cut control due to species adjustment factors. Based on a review of cut control information, staff found that 7.2 percent of the volume charged has been removed from the cut control of replaceable forest licences due to application of species adjustment factors. This represents about five percent of the total AAC for the TSA.

Since the inventory information used in the base case did not account for the contribution of dead potential volume that is now charged to cut control, I conclude that the base case short- and mid-term timber supply are underestimated by about five percent. I will account for this in my determination as discussed in '**Reasons for Decision**'.

Another log grade consideration is the administrative practice of grade 4 credits. To encourage utilization of grade 4 (pulp logs) and to limit the amount left in the bush, Section 17 (6) of the *Cut Control Regulation* allows licensees to apply for a cut control credit for any grade 4 log shipped to a facility other than a sawmill or veneer plant. With an oriented strand board plant located in 100 Mile House, there is significant use of the grade 4 credit. From January 1, 2007 to December 31, 2011, 1 052 927 cubic metres - about 16 percent of the volume harvested over that period - were removed from cut control as grade 4 credits. FLNR staff are concerned that grade 4 credits have effectively allowed a rate of harvest higher than the AAC.

Section 17 (6) of the *Cut Control Regulation* applies to grade 4 volumes sold or delivered until June 1, 2014. Since the provision will be expiring within the year, I have not considered the impact of grade 4 credits in this AAC determination. Consequently, if grade 4 credits are extended beyond June 2014, the actual rate of harvest could exceed the AAC I establish, which represents the maximum sustainable harvest level. Such overharvesting could adversely affect other resource values as well as the future timber supply.

Since grade 4 includes both live and dead timber, grade 4 credits could increase the amount of live timber being harvested thus exacerbating concerns discussed in ‘**AAC partition**’.

As noted in “**Implementation**”, if the provision for grade 4 credits is extended beyond June 1, 2014, I request that district staff report to me on an annual basis the volumes being credited and provide an assessment of the risks to other resource values and to the mid-term timber supply.

*- utilization standards*

District staff have reviewed the utilization standards used in the base case and indicate that they appropriately reflect current practice.

A member of the public and a licensee both expressed the need for an updated definition for ‘problem’ forest types. Prior to 2002, problem forest types were defined as forest stands incapable of producing significant sawlog volumes within normal rotation periods. District staff advise that experience has shown that these stands often contain a mix of diameter classes with sufficient, albeit lower, sawlog volumes and; therefore, do contribute to the sawlog profile. Current practice finds all tenure holders – sawlog and pulpwood - operating in these stand types. Consequently, no differentiation was assumed between stands previously referred to as problem forest types and other stand types.

Public and licensee input addressed the possibility of increasing utilization standards. I will address increased utilization and related input in ‘*mid-term timber supply*’ under the section titled ‘**Abnormal infestations, devastations and salvage programs**’.

FLNR staff are concerned that the administration of waste assessments may result in significant underestimation of waste volumes that should be charged to licensees’ cut control. Waste administration practices could effectively allow more harvesting and result in a bigger impact on resource values than was assumed in this timber supply review, similar to the potential risk from continued grade 4 credits.

I accept the utilization standards used in the base case as reflecting current practice and I agree with the base case approach in which stands types previously referred to as problem forest types were included in the THLB where they meet all other harvest eligibility criteria. I request that district staff monitor and assess the effectiveness of current waste administration practices and advise the chief forester of any apparent risks to resource values or to the mid-term timber supply and I have noted this in ‘**Implementation**’.

**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

*- general comments*

The Ministry of Forests and Range (now part of the Ministry of Forests, Lands and Natural Resource Operations) is required under the *Ministry of Forests and Range 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. The *Forest and Range Practices Act* and other legislation provide for, or enable, the legal protection and conservation of timber and non-timber values.

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.

In the 100 Mile House TSA, direction and guidance for IRM objectives is provided by the Cariboo-Chilcotin Land Use Plan, the associated Sustainable Resource Management Plans, the associated June 25, 2010 Land Use Order, approved wildlife habitat areas with associated general wildlife measures established under the *Government Actions Regulation*, scenic areas with associated visual quality objectives, and a designated community watershed. In determining the AAC for the 100 Mile House TSA, I have considered the legal requirements established by these orders.

*- cultural heritage resources*

Cultural heritage is a core First Nations value and is an integral part of First Nations traditional culture and sustainability. First Nations in the area of 100 Mile House were traditionally reliant on a transient lifestyle to access food sources throughout the seasons across a large geographic area. Although winter habitation was generally in the same location for each band, early spring initiated a time of travel for hunting, fishing, and gathering of various plants, roots, wood products and berries that lasted until late fall. Trail systems were fundamental to travel throughout the area and continue to be used for contemporary cultural and subsistence practices. As traditional use often related to practices of hunting, food gathering, camp sites, and fishing along water courses, the occurrence of culturally significant sites often coincides with riparian areas, wildlife habitat, and other non-timber values.

An archaeological overview assessment and band-specific traditional use studies have been completed within the TSA; however, information from archaeological assessments and research is limited. Most of the archaeological sites are scattered in small areas across the TSA, with the exception of one site at the southern end of the TSA where over 340 culturally-significant depressions (e.g., pre-contact habitation pits, roasting pits, human burial remains, etc.) are found over a two-kilometre square area. First Nations express frustration with the lack of funding and effort directed toward locating and documenting important cultural features to ensure their protection. Some First Nations are incorporating cultural heritage values into land-use planning through their own watershed plans or stewardship retention plans. First Nations requests to have cultural heritage and archaeology assessments included in development applications are increasing.

In general, cultural heritage sites tend to be relatively small in comparison to the land base modelled in a strategic-level timber supply analysis. In addition, these sites often overlap with areas reserved for other management objectives (e.g., riparian reserves). District staff indicate that the amount of area that is managed solely for cultural heritage purposes is relatively small by comparison. Consequently, no additional area was excluded from timber harvesting in the base case to account specifically for cultural heritage values.

District staff indicate that site-specific consultation occurs with First Nations at an operational level during the cutting authority adjudication process. Licensees routinely refer all cutblock proposals to First Nations for comment before submitting cutting permits to the ministry for approval. In some instances licensees have responded to First Nations concerns by altering block design, expanding buffers around wildlife and water resources, retaining land adjacent to cutblocks and limiting post-harvest access through intensive road deactivation.

Based on my consideration of the information provided by First Nations and district staff, I conclude that it is likely some identified culturally significant sites were inappropriately included in the THLB used in the base case. However, given the available information, the

generally small size of cultural heritage sites and the significant overlap between these sites and areas excluded from timber harvesting to account for other values, I conclude that the assumptions used in the base case are adequate for use in this determination. I also note that the THLB used in the base case is a theoretical construct used for a strategic level timber supply review and does not dictate where actual operations will occur. I encourage district staff and licensees to continue to work collaboratively with First Nations at an operational level to ensure that First Nations culture heritage values are accommodated.

*- moose*

In the 100 Mile House TSA wetlands occupy 7645 hectares. Of this area 6766 hectares were excluded from the THLB to account for a variety of factors. High value wetlands for moose identified in the Cariboo-Chilcotin Land Use Plan were assumed to be managed at the operational level and were not specifically excluded from the THLB.

First Nations are concerned about the amount of salvage harvesting in the TSA and its impact on moose populations. As previously discussed under “*roads, trails and landings*”, district staff have observed that road density has been increasing in recent years and is nearly double historic levels. District staff are concerned that this increase in road access increases the vulnerability of moose to hunting, poaching and habitat degradation.

Government is currently developing tools to assess the cumulative effects of a variety of factors on the land base. One of these tools, recently developed in the Cariboo Region, focuses on risk to moose by assessing three indicators – ecological importance (abundance of moose winter habitat), hazards (impacts to habitat from forest harvesting or road development), and current mitigation (what proportion of the habitat is currently protected). Only recently implemented, this tool is being used to assess whether proposed operations will impact high value moose habitat. The results are being shared with licensees and First Nations so that avoidance or mitigation options can be considered during consultation. District staff inform me that a number of plans recently submitted by licensees include changes to help mitigate negative effects on moose habitat.

I accept that the assumptions used in the base case to account for moose habitat are adequate for use in this determination. Although the modelling tool, described above, has only recently been implemented, I take some comfort in knowing that the results are already being shared with First Nations and licensees to enhance consultation. I look forward to reviewing the results of this innovative and collaborative work during subsequent timber supply reviews.

**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;**

Other information

*- First Nations considerations*

The Crown has a duty to consult with, and accommodate if necessary, those First Nations for whom it has knowledge of the potential existence of aboriginal interests that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations. As deputy chief forester, I must therefore consider information arising from the consultation process with First Nations respecting aboriginal interests and treaty rights that may be affected by my AAC determination. As well, I will consider other relevant information available to the ministry regarding aboriginal interests, including information gathered during other consultation processes.

I note that there is a rich, diverse aboriginal history in the 100 Mile House TSA and that the TSA overlaps with the traditional territories for a number of First Nations. Three First Nations communities are physically located within the TSA. These three communities are home to the Tsq'escen First Nation (Canim Lake Indian Band), Stswecem'c Xgat'tem First Nation (Canoe/Dog Creek Indian Band) and Llenlney'ten (High Bar) First Nation. Whispering Pines/Clinton Indian Band, in addition to Canim Lake, Stswecem'c Xgat'tem and High Bar First Nations make up the four core bands for the 100 Mile House District. All four bands are part of the Secwepemc (Shuswap) people.

Canim Lake (Tsq'escen) Indian Band and Stswecem'c Xgat'tem First Nation are also members of the Northern Secwepemc te Qelmucw (Shuswap People of the North) along with bands from outside 100 Mile House TSA; Williams Lake (T'exelc) and Soda Creek (Xatsu'll) Indian Band. The Northern Secwepemc te Qelmucw is currently in treaty negotiations with the Province of British Columbia and Canada that will likely include a land offer component within the 100 Mile House TSA.

Other First Nations with aboriginal interests and traditional territory in the 100 Mile House TSA include the Bonaparte Indian Band, Skeetchestn/Tk'emlups Indian Bands, Simpcw First Nation, Esk'etemc First Nation, Williams Lake Indian Band, Coldwater/Cook's Ferry/Siska Indian Bands, Ashcroft Indian Band, Bridge River Indian Band, Ts'kw'aylaxw First Nation, Tsilqhot'in Nation, Nlaka'pamux Nation Group and St'at'imc/Lillooet Tribal Council.

The four core bands in the 100 Mile House TSA are engaged in forest economic and stewardship activities throughout the area and have expressed interest in expanding these opportunities. Forest consultation and revenue sharing agreements (FCRSA) exist for Canim Lake Indian Band, High Bar First Nation, and Stswecem'c Xgat'tem First Nation. Whispering Pines/Clinton Indian Band has an economic development agreement (along with multiple bands in the Kamloops TSA). Canim Lake Indian Band has a forest tenures opportunities agreement (FTOA), two woodlot licences, and a First Nations woodland licence. High Bar First Nation has an economic development agreement (along with multiple bands in the Kamloops TSA). Stswecem'c Xgat'tem First Nation has a woodlot licence. Discussions are underway for a FTOA and associated First Nations Woodland Licence.

The FCRSA and FRO provide for revenue sharing and forest tenure opportunities, and contain a framework for establishing consultation processes to guide consultation on administrative and operational decisions, including AAC determinations. The First Nations consultation requirements specified in these agreements were followed during the consultation conducted as part of this timber supply review. For those First Nations communities who have not established consultation processes, consultation was conducted in accordance with the consultation spectrum described in the Haida decision<sup>1</sup>, guidance in the 2010 Consultation Procedures<sup>2</sup> and the British Columbia Cariboo Region Forest and Range Decision Annual List (Matrix).

On June 28, 2011, consultation on this timber supply review was initiated with all First Nations and First Nation groups whose traditional territories overlap the 100 Mile House TSA. An initial consultation letter included an overview of the timber supply review process, and how information related to aboriginal interests that may be impacted by the AAC decision could be brought into the process. Two First Nations (Canim Lake Indian Band and Skeetchestn Indian

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<sup>1</sup> *Haida Nation v. British Columbia* (Minister of Forests), 2004 SCC73.

<sup>2</sup> *Updated Procedures For Meeting Legal Obligations When Consulting First Nations*, Province of British Columbia, 07 May 2010.

Band) responded by email to acknowledge receipt of the timber supply review initiation letter and expressed interest in receiving further information throughout the process.

On January 9, 2012, a second letter with a copy of the data package was sent to all relevant First Nations indicating that the data package was available for review. A 60-day consultation period ensued with comments requested by March 16, 2012. Esk'etemc First Nation responded asking for "flexibility" to operate in the 100 Mile House TSA. As this was not specific to the timber supply review process, the district manager responded separately.

On January 9, 2013, a third letter was sent to all First Nations and stakeholders, along with an advertisement published in local newspapers advising the public that the *100 Mile House TSA Timber Supply Analysis Public Discussion Paper* was available for review. In the letter, First Nations were encouraged to provide any information regarding aboriginal interests that might be impacted by an AAC decision or other information by March 11, 2013. Invitations were extended to meet with any group or individual to provide further information regarding the timber supply review. On February 15, 2013 a meeting was held with representatives of the Canim Lake Indian Band in response to their request. At the meeting, Canim Lake Indian Band expressed concern that the "cut is elevated by the model and will carry into green wood." After further discussion, Canim Lake Indian Band representatives stated that if a dead/green partition is established, no further comments would be necessary and that a letter expressing these concerns would follow.

A letter was received from the Canim Lake Indian Band on March 4, 2013, thanking the district manager for initiating consultation with First Nations. The letter included Canim Lake Indian Band's belief that the "current timber supply methodology is flawed and routinely produces inflated AACs." The band asserts that "the introduction of a green-wood/dead-wood partition (set at 500 000 cubic metres per year of green wood as described on page 9 of the public discussion paper) for the upcoming AAC is critical" as it will "help ensure that key Aboriginal interests and mid-term timber supply are not compromised in the short-term." Canim Lake Indian Band proposes a multi-stakeholder review and revision of the existing land use planning framework that could incorporate their values and interests and address the impact of the MPB. The letter stated that in the absence of such a process, any AAC will be regarded as temporary. Canim Lake Indian Band stated that a green-wood/dead-wood partition based on cruise volumes would satisfy consultation on this "temporary" AAC. No other information has been received from other First Nations regarding this timber supply review.

Northern Secwepemc First Nations (NStQ) treaty negotiations are currently discussing settlement lands and a *Land Act* Section 17 map reserve is in place covering some of the Crown land that has been offered in the negotiations. At this time, harvesting on these lands has not been restricted through the issuance of a ministerial order under Section 167, Part 13 of the *Forest Act*. However, I understand that current practice among licensees is to voluntarily refrain from making applications within the area.

No specific information was presented to me that quantifies the amount of wildlife or wildlife habitat, or area for cultural or subsistence practices that is needed in addition to the assumptions used for these values in the base case. Area exclusions and volume reductions in the base case for old-growth management areas, riparian reserve zones and other reasons will serve to address these interests to some unknown extent. It appears generally that at this time the required management adjustments can be, and are being, made operationally, without incurring changes in the projected timber supply. If further clarity is gained on any of these issues, for instance through ongoing consultations or joint studies, this information can be considered in future determinations.

Based on my review of the information sharing and consultation processes described above, the available information regarding aboriginal interests, and the potential impact my decision may have on these interests, I conclude that the consultation requirements established in agreements between government and First Nations or as outlined in the *Haida* decision have been met and are consistent with the 2010 Consultation Procedures. Furthermore, I note that district staff will continue to be available to meet and consult with First Nations at the operational planning level.

I am satisfied that opportunities were provided to all First Nations to share their concerns related to specific aboriginal interests that may be impacted by this decision and to the extent possible within the scope of my authority under Section 8 of the *Forest Act*, I have accommodated those aboriginal interests that were made known to me during consultation on this decision. If new information regarding First Nations' aboriginal interests becomes available that significantly varies from the information that was available for this determination and that may affect timber supply, I am prepared to revisit this determination sooner than required by legislation.

*- harvest performance*

In the 2006 AAC determination rationale, the chief forester indicated that it was his expectation that 90 percent of the total harvest volume originate from stands with 70 percent or more pine. Harvest performance information during the period from 2006 to 2012 showed full utilization of the AAC and the proportion of pine harvest was reasonably consistent with the chief forester's direction. I would like to commend the licensees and district staff for helping to conserve the mid-term timber supply and improve the mid- to long-term timber supply by strategically directing harvesting into dead pine stands. This demonstrated ability to focus on salvage harvesting in the TSA is pivotal to my AAC decision and I will discuss this further in my determination as discussed in "**Reasons for Decision**".

*- AAC partition*

Section 8(5) of the *Forest Act* allows the chief forester, in determining an AAC, to specify a portion of the AAC that is attributable to certain types of timber, terrain, or areas of the TSA. This is referred to as an 'AAC partition'. Historically, AAC partitions identified problem or marginal timber in order to encourage harvest performance in these stands. More recently, AAC partitions delineate timber that is typically of a higher value and/or in a more limited supply that is at risk of over-harvesting. The AAC partition therefore identifies the maximum harvest volume that the chief forester considers is available within the specified timber type.

An AAC partition informs licensees and the public of a harvest limit but it does not directly regulate the harvest from that type of timber. Section 75.02 of the *Forest Act* authorizes the minister to issue partition orders to ensure that licensees abide by the partition established by the chief forester.

In the base case, individual harvest priorities were set for different components of the forest to reflect current harvest performance. In order of priority the model focused on: the salvage of pine-leading stands with at least 70 percent pine, in which at least 50 percent of the stand is dead; the secondary salvage of pine-leading stands with between 50 percent and 70 percent pine, in which at least 50 percent of the stand is dead; and the salvage of spruce-leading stands with more than 70 percent spruce located in known spruce bark beetle infested landscape units (Deception Mountain, Hendrix Lake, McKinley and Spanish Landscape Units).

Using these harvest rules, the base case projected that the current AAC of 2.0 million cubic metres can be maintained for seven years before decreasing to a mid-term level of 890 000 cubic

metres per year. During this time, 1.5 million cubic metres per year is attributable to trees that were dead prior to harvest. The remaining 500 000 cubic metres per year represents the incidental harvest of live trees within dead stands.

A sensitivity analysis was prepared to examine the timber supply impact of avoiding the salvage of high mortality pine stands and instead focusing the harvest on pine stands with low mortality and other commercial tree species over the next five years. These changes resulted in a 24 percent decrease in the mid-term timber supply and a 10 percent decrease in the long-term timber supply.

District staff support institution of a live tree partition and indicate that they could implement a partition to conserve live trees based on cruise data. In a meeting with district staff and in a subsequent letter, the Canim Lake Indian Band stated that in order to ensure that key aboriginal interests and the mid-term timber supply are not compromised I should establish a 500 000 cubic metre partition in the AAC attributable to live trees.

One licensee also recommended that I establish a partition to limit the harvest of live trees over the term of the AAC. Another licensee indicated that if I establish a live tree partition, licensees should receive direction on how the partition is to be implemented.

A member of the public referred to a news article in which a licensee predicted that I would establish a partition limiting the harvest of live trees at about half the level of the current AAC – 1.0 million cubic metres per year. This individual was concerned that a partition at this level would be too high.

I have considered all of the available information, including the projected live component of the base case harvest forecast, the sensitivity analysis, licensee harvest performance and input provided by the public, First Nations, and licensees. On this basis, I have concluded that a partition to conserve live trees is necessary to mitigate the projected decrease in mid-term timber supply. Furthermore, I have concluded that conserving live trees in the short term lessens the impact of salvage harvesting on non-timber values. I am also mindful that implementation of a live tree partition will help to address the concerns raised by the Canim Lake Indian Band. On this basis, I will institute a live tree partition in the AAC I determine, as discussed in “**Reasons for Decision**”.

With regard to the licensee comment regarding implementation of a live volume partition, it is my expectation that following this determination, that licensees will work with district staff to clarify how the partition will be implemented. Furthermore, it is my expectation that district staff will monitor the harvest of live trees and report on harvest performance and adherence to the live tree partition. If it appears that the harvest of live trees exceeds the partition established in this AAC, I expect district staff to make recommendations to the minister to issue a partition order, as provided in legislation, as noted in “**Implementation**”.

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

Alternative rates of harvesting

*- alternative harvest forecasts*

With 72 percent of the mature pine killed by MPB and prompt regeneration largely dependent on salvage operations, variations in the distribution and timing of the harvest in the next few years can result in very different levels of timber supply in the mid- and long-term. The assumptions used in the base case are based on harvest priorities supported by reasonable economic

conditions. Licensee harvest performance has been consistent with the chief forester's expectation that affected pine stands will be targeted; however, as salvage nears completion and the harvest increasingly consists of marginal stands, it is uncertain whether this level of performance can be maintained. Alternative harvest forecasts were prepared to investigate the effect on timber supply of less than ideal harvest behaviour that is not ideal and if full salvage is not possible.

In addition to the base case, two alternative harvest forecasts were prepared. The first examined the effect of immediately reducing the harvest to the mid-term level ('end salvage' forecast). The second was prepared to identify the highest initial harvest level that could be maintained for the 10-year period from 2013 to 2022 ('10-year even-flow') forecast.

In the 'end salvage forecast', the initial harvest level was immediately set at the mid-term level of 925 000 cubic metres per year which is 35 000 cubic metres per year or about four percent higher than the base case mid-term harvest level. The harvest priorities in the model were changed such that harvesting was no longer focused on the salvage of pine-dominated stands with high levels of mortality, or spruce-dominated stands in spruce bark beetle infested areas. The long-term harvest level in this alternative forecast was 1 480 000 cubic metres per year, which is 140 000 cubic metres per year or 8.6 percent below the base case level. In this scenario, non-recovered losses peaked at about 13 million cubic metres, which is 200 000 cubic metres per year or 1.5 percent higher than in the base case. Continued acceleration of harvesting in order to salvage in the base case results in an additional harvest volume of 7 520 000 cubic metres when compared to the 'end salvage forecast'. Over the mid-term period, the 'end salvage forecast' results in the harvest of an additional 1 860 000 cubic metres compared to the base case.

In the '10-year even-flow' forecast, the highest initial harvest level that could be maintained for 10 years was 1 250 000 cubic metres per year, which is 750 000 cubic metres per year or 37.5 percent lower than the current AAC, which is the same as the base case initial harvest level. After the first decade, the harvest level declined to 900 000 cubic metres per year, which is 10 000 cubic metres per year or about one percent higher than the base case mid-term harvest level. The long-term harvest level in this forecast was 1 560 000 cubic metres per year, which is 60 000 cubic metres per year or 3.7 percent lower than the base case long-term harvest level. In addition to the differences in projected harvest levels, the non-recoverable loss of growing stock peaked at 14 million cubic metres, which is 1 150 000 cubic metres or nine percent higher than in the base case.

Four comments received from the public and First Nations expressed concern over whether the initial harvest level of 2 000 000 cubic metres per year can be maintained for seven years. One other person recommended that I decrease the AAC gradually over the next six years. In response, I note that all of my considerations, including the appropriateness of the base case initial harvest level and transition to a lower mid-term harvest level are discussed throughout this document and in my "**Reasons for Decision**".

I have considered the short- and long-term implications of alternative rates of harvest. On this basis, I conclude that the magnitude of the decrease in mid-term timber supply is very dependent on the extent to which live volume can be conserved in the short term by maintaining the current focus on the salvage of dead trees. In addition, I note that a reduction in the amount of dead volume salvaged adversely affects the long-term harvest level. I will discuss my consideration of alternative harvest forecasts in '**Reasons for Decision**'.

**Section 8(8) (c) repealed [2003-31-2 (B.C. Reg. 401/2003)]**

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;**

Economic and social objectives

*- Minister's letters*

The Minister of Forests and Range expressed the economic and social objectives of the Crown in two letters to the chief forester, dated July 4, 2006 (attached as Appendix 3) and October 27, 2010. 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.

In respect of this, in the base case projection and in the alternative harvest flow projections described above, a primary objective in the harvest flow has been to attain a stable, long-term harvest level where the growing stock also stabilizes.

Finally, 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.

During my consideration of the factors required under Section 8 of the *Forest Act*, I have been mindful of the local objectives, as provided in the Cariboo-Chilcotin Land Use Plan and associated plans and orders. 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 government as expressed by the minister.

*- employment and community dependence*

The implication of changes in the AAC for local communities is an important consideration in the timber supply review.

Based on the report *2006 Economic Dependency Tables for Forest Districts*, the forest sector in the 100 Mile House Natural Resource District accounts for 26 percent of total basic employment. Other sectors providing employment in the 100 Mile House Resource District include: public sector (26 percent); tourism (16 percent); construction (16 percent); agriculture and food (8 percent); and mining and mineral production (2 percent).

Prior to 2006, there were 1488 person-years of direct, indirect and induced employment associated with the forest sector in the 100 Mile House TSA. From 2007 to 2011, when the AAC was increased to facilitate the salvage of dead pine, employment increased to 1,757 person-years. About 31 percent of the total forest sector jobs are associated with harvesting and silviculture, 45 percent with timber processing and 24 percent were indirect plus induced jobs generated by the forest sector.

Mills receiving timber from 100 Mile House TSA include: West Fraser Mills Limited's 100 Mile Lumber and Chasm Sawmills, Ainsworth Lumber Company Limited's 100 Mile House Oriented Strand Board Plant, Tolko Industries Limited's Williams Lake Sawmill, West Fraser Mills Limited's Williams Lake Plywood Plant, and Interfor's Adams Lake Lumber Mill. Four large and several small log home builders in the area also rely on timber from the timber supply area.

I have reviewed the information regarding employment and community dependence related to the 100 Mile House TSA. I am aware of the linkages between AAC and employment, both locally and provincially, and I have taken this into account in this determination.

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

Abnormal infestations, devastations and salvage programs

*- mountain pine beetle infestation*

At the time of the 2002 AAC determination, district staff noted that mountain pine beetle (MPB) infestation was contributing to an increase in unsalvaged losses in the TSA. By 2005, the beetle epidemic had killed about 650 000 hectares of pine stands and was rapidly expanding. This led to the chief forester's 2006 decision to increase the AAC to support the forest management strategy of capturing as much value as possible from the dead timber before it deteriorated beyond the point where it was of commercial value. The MPB infestation in 100 Mile House TSA peaked in 2006.

The BC Mountain Pine Beetle model (BCMPB), developed by FLNR, projects that the beetle infestation has collapsed and that there will be no significant new pine mortality in the 100 Mile House TSA. This has been confirmed by three years of aerial forest health survey data. The total actual beetle-killed pine volume was estimated to be about 42 million cubic metres. New BCMPB mortality estimates published in April 2013 reduced the killed pine volume estimate to 41 million cubic metres which represents about 70 percent of the mature pine volume in the THLB.

The latest total mortality estimate, which is one million cubic metres less than the previous estimate, could not be incorporated into the base case in time for this determination. Therefore, I conclude that the base case mid-term timber supply is underestimated by about one million cubic metres. Assuming that this volume will be harvested evenly over the mid-term period - about five decades - this volume represents a 20 000-cubic metre per year underestimation in the base case mid-term harvest level. I will account for this in my determination, as discussed in **'Reasons for Decision'**.

In the base case, it was assumed that dead pine contributes some form of economically-viable fibre until the tree has deteriorated to the point of collapse ('fall-over') 15 years after tree death. The length of time that a beetle-killed pine tree remains commercially usable ('shelf life') varies depending on many factors including the type of product being manufactured. It is generally accepted that the quality of wood gradually diminishes after death from dimensional lumber quality through to pulp/OSB fibre to secondary product (e.g., biofuel) quality. No assumptions were made in the base case about the shelf life for sawlogs because of numerous uncertainties including environmental conditions, market factors and evolving milling technology.

One licensee commented that a 'shelf life' of 15 years is too optimistic from a sawlog perspective and recommended that the AAC determination should consider sawlog *versus* non-sawlog fibre availability in relation to shelf life. The licensee suggested that at a minimum, harvest volumes should be identified based on the categories in the public discussion paper (i.e., live pine, pine 3-5 years dead, pine 6-10 years dead, and pine 11+ years dead).

Another licensee commented that a 15-year shelf life is reasonable from a sawlog perspective but oriented strand board can be manufactured from dead pine for as long as the timber remains relatively dry and not in close proximity to the ground. The licensee expects that dead pine can stay economically viable in the western portion of the TSA for approximately 20 years and recommends a close examination of shelf life in the AAC determination.

In a sensitivity analysis, reducing the 'fall-over' age from 15 to 10 years decreased the length of time the initial harvest level could be maintained by two years. It also decreased the mid-term timber supply by seven percent and the long-term timber supply by four percent relative to the base case.

In another sensitivity analysis, the 'fall-over' age was increased to 20 years. This allowed the initial harvest level to be maintained for one additional year compared to the base case followed by a transitional step down to 1.4 million cubic metres for one year. The change also decreased the mid-term timber supply by one percent and increased the long-term timber supply by less than one percent.

I accept the approach used in the base case in which sawlogs were not specifically modelled and the results were not complicated by having multiple categories of dead pine. The base case and the sensitivity analysis provide me with sufficient insights about the sensitivity of the timber supply to the length of time that dead pine can be economically salvaged and I will be referring to the sensitivity analysis results in my determination, as discussed in '**Reasons for Decision**'.

*- other forest health issues*

In addition to MPB, Douglas-fir beetles, spruce bark beetles and balsam bark beetles, there are other biotic and abiotic forest health issues which reduce growth or induce mortality in young forest stands. I received information about a variety of pests including: defoliators, root diseases, rusts and needle casts that affect stands in the 100 Mile House TSA and note that rusts account for a large proportion of the losses in young lodgepole pine stands. I appreciate that the issue of rusts in regenerating stands is receiving ongoing attention from FLNR staff. I encourage FLNR staff to monitor whether young stands are meeting minimum stocking standards given the impact of the various forest health issues and I have noted this in '**Implementation**'.

*- non-recoverable losses*

Non-recoverable loss factors are used in the analysis to account for the average volume lost each year due to natural causes, such as pests, fire and wind, that are not recovered or salvaged. Endemic pest losses are considered natural processes within stands and are accounted for within growth and yield models. Unsalvaged losses due to epidemic levels of MPB infestation are addressed separately.

During the public review period, one person commented that the assumed unsalvaged loss due to wildfire used in the base case was significantly underestimated. Data from fire reports for the period 2003-2012 were included with the comment. District staff note that the 10-year average was skewed significantly by the very large and abnormal Kelly Creek Fire of 2009, much of which was within a park, an area that does not contribute to timber supply. District staff maintain that the estimate of non-recoverable losses due to fire that have been adjusted to account for the 2009 fire are more realistic.

The non-recoverable loss estimates used in the base case were based on the assumption that 15 000 cubic metres per year of salvage was occurring under the district's small scale salvage program. However, district staff indicate that this volume is not being salvaged.

On this basis, I conclude that the non-recoverable losses used in the base case were inappropriately reduced by 15 000 cubic metres per year and I will account for this in my decision as discussed in "**Reasons for Decision**".

- *climate change*

Although the causes of climate change are still controversial there is significant agreement amongst scientists that climate is changing and that these changes will affect forest ecosystems. However, there is still significant uncertainty how climate change will manifest in different parts of the province.

Throughout the interior of BC, warmer summers, the reduced frequency of extreme cold periods and large areas of suitable and contiguous host all contributed to the recent MPB epidemic. In the 100 Mile House TSA, MPB infestation is projected to kill about 41 million cubic metres of pine.

FLNR's *Forest Stewardship Action Plan for Climate Change Adaption* identifies goals and objectives for anticipating and managing forests in a changing climate. Associated actions include climate based seed transfer guidelines, maintaining or enhancing tree species diversity, and reducing the amount of monocultures. The overall goal is to set up a structural model for adapting BC's forest management practices to foster resilient forests in a changing climate.

As discussed in 'Guiding principles for AAC determinations', climate change is a key area of uncertainty. As research provides more definitive information and where forest practices are implemented to mitigate or adapt to the potential effects of climate change on forest resources, the information will be considered in AAC determinations. The requirement for regular AAC reviews will allow for the incorporation of new information from research and new forest practices as they are implemented.

- *mid-term timber supply*

In May 2012, a Special Committee on Timber Supply was appointed by the BC Legislature to make recommendations to address the reduction of mid-term timber supply due to MPB in the central interior of BC. The committee's report is entitled *Growing Fibre, Growing Value* (August 2012). The Ministry of Forests, Lands and Natural Resource Operations has responded to the committee's recommendations in *Beyond the Beetle: A Mid-term Timber Supply Action Plan* (October 2012). Key ministry responses related to the timber supply review program include:

- Review marginally economic forest types within each timber supply area and quantify the types and areas of forest that might justifiably be included in a partition within the timber harvesting land base, while respecting resource objectives for other values, such as wildlife and water. (Discussed below in "Marginally economic forest types").
- Examine the potential for including more fibre in the AAC for the 100 Mile House TSA by expanding utilization standards. (Discussed below in "Expanded utilization standards").
- Where feasible and appropriate, provide information from the timber supply review to enhance public discussion of resource management objectives. FAIB staff indicate that the information prepared for timber supply reviews is made available to support other resource management decisions; however, this occurs outside of the timber supply review process.

- Complete a new Vegetation Resources Inventory photo-interpretation in the areas most heavily affected by the MPB. (Discussed in ‘forest inventory’).
- Continue to place a high priority on forest health activities designed to protect the mid-term timber supply from further losses. (Discussed in ‘other forest health issues’).

### Marginally economic forest types

In earlier timber supply reviews for the 100 Mile House TSA, problem forest types were defined as forest stands incapable of producing significant sawlog volumes within normal rotation periods. These stands were viewed as marginally economic for sawlog purposes but suitable for pulpwood. The timber supply from problem forest types was partitioned in the AAC and allocated to the Pulpwood Agreement 16 licence.

In the 100 Mile House TSA, some low site areas are reserved from timber harvesting to provide for other values. After these stands were excluded, an additional 7244 hectares of stands growing on low productivity sites that are currently considered to be uneconomic to harvest were excluded from the THLB. These stands represent a potential harvest volume of about 1.1 million cubic metres in total.

During public review, a number of comments were received regarding problem forest types and low productivity sites. One licensee noted that the timber formerly identified as ‘problem forest types’ is critical to the fibre supply of its oriented strand board plant in 100 Mile House and asked that options be considered for their continued future availability. A comment was also provided in which a licensee agreed that low productivity sites should be excluded from the THLB at this time, but requested their potential future development be considered pending further field examination and confirmation of operability.

In response, staff note that since 2002, stands previously considered problem forest types are not specifically identified and are assumed to contribute to the overall timber supply of the TSA. District staff indicate it is difficult to distinguish between the problem forest types and other stand types and that problem forest types are harvested for both sawlog and non-sawlog uses. With regard to the potential for low productivity stands to contribute to timber supply, I note the *100 Mile House Utilization and Fibre-based AAC Pilot Project* has recently been initiated by the ministry. The stated objectives of this pilot are “to grow the AAC through the inclusion of additional fibre” and “to test enhancement opportunities and ultimately improve the utilization of fibre within the pilot area”. It is my understanding that the potential timber supply contribution of low productivity stands will be examined as part of this pilot.

I have considered the information provided to me regarding problem forest types and low productivity stands. Given the difficulty in identifying stands as problem forest types and the use of these stands for both sawlog and non-sawlog purposes I conclude that it is appropriate for these stands to contribute to the base case timber supply. On this basis, I will not establish a partition in the AAC for problem forest types. With regard to low productivity stands, as there is no demonstrated performance within these stands, I accept that they were appropriately excluded from the THLB used in the base case. In the future, if there is significant performance in low productivity stands, these stands can be considered for inclusion in the THLB in subsequent timber supply reviews.

### Expanded utilization standards

A sensitivity analysis investigated the impact on the base case timber supply forecast of using “close” utilization standards, which include a 10-centimetre-diameter at breast height, 15-centimetre stump height and 4-centimetre top. The analysis showed that if all stands in the THLB were harvested using expanded utilization standards, the base case harvest levels would increase by 8, 10, and 12 percent in the initial-, mid- and long-term, respectively.

A member of the public is concerned that lower utilization standards could promote early harvesting in potential sawlog stands that, if left growing, might help mitigate the anticipated decrease in mid-term timber supply.

A licensee believes there is a significant fibre opportunity associated with increased levels of utilization but notes that there are impediments to implementation in legislation, policy and tenure administration. The licensee recommends that this opportunity be considered in the determination process and that potential actions be highlighted to address impediments. In response, I note that these concerns are being considered as part of the fibre-based AAC pilot program discussed above.

Another licensee recommends that if close utilization is being considered, a sensitivity analysis should be prepared for sawlog close utilization in which 12.5 centimetres diameter at breast height and 10 centimetre top is applied to all species.

I note that the sensitivity analysis demonstrates that utilizing smaller diameter trees and reducing the height of stumps can increase the short-, mid- and long-term timber supply and therefore is an opportunity to mitigate the decrease in mid-term timber supply if the volume can be utilized economically. Additional sensitivity analyses would not significantly enhance this general insight.

In accordance with my guiding principles, I do not consider it appropriate to base AAC decisions on proposed or potential practices that are not substantiated by demonstrated performance or are beyond current legal requirements. In considering the potential opportunity for increasing timber supply by expanding utilization standards, I have not been provided with information that would substantiate demonstrated performance or explain how the standards can be implemented within existing legislation, policy and tenure administration. My understanding is that licensees are currently not restricted from practicing closer utilization of the stands that they are harvesting and that some of the additional volume would not be chargeable to cut control.

The ministry has recently initiated a pilot project to improve the utilization of fibre in the 100 Mile House TSA and to test new administrative tools and policies that could support the inclusion of more fibre in the AAC. In the event that this pilot or other activities undertaken by licensees result in demonstrated changes in fibre utilization, this information can be incorporated in subsequent timber supply reviews.

### **Reasons for Decision**

In reaching my AAC determination for the 100 Mile House TSA I have considered all of the factors required under Section 8 of the *Forest Act* and I have reasoned as follows.

The history of the AAC and the mountain pine beetle infestation creates the context for the new AAC. Prior to the rapid expansion of the mountain pine beetle epidemic, the AAC for the 100 Mile House TSA was 1.344 million cubic metres. The current AAC of 2.0 million cubic metres was determined in 2006 following an urgent timber supply review to address the mountain pine beetle epidemic. The mountain pine beetle infestation peaked in 2006 and recent forecasts and surveys have confirmed that the mountain pine beetle infestation has collapsed. The

estimated total volume of beetle-killed timber is 41 million cubic metres. Spruce bark beetle and other forest pests continue to cause mortality in non-pine stands. This AAC determination must address the ongoing salvage harvest of dead trees and the transition to a lower mid-term timber supply.

For most AAC determinations, a timber supply forecast is prepared that attempts to avoid excessive changes from decade to decade and significant timber shortages in the future. For the 100 Mile House TSA, with 70 percent of the dominant tree species killed by mountain pine beetle and a limited time to salvage the dead pine, it was not possible to produce a forecast that avoided large changes throughout the forecast period. The base case modelled the current harvest priorities that attempt to maximize the salvage of dead timber volume and minimize non-recoverable losses. Dead pine trees were assumed to have commercial value until they fall-over, which was assumed to occur in 15 years. The initial harvest level in the base case was set at the current AAC of 2.0 million cubic metres. This rate could only be maintained for seven years from the start of the forecast period in 2012. After seven years, in 2019, the harvest level decreases to 890 000 cubic metres per year and remains at this mid-term level for 48 years until 2067, after which it begins to increase to the long-term sustainable level of 1.6 million cubic metres per year in 2086.

In my considerations for the 100 Mile House TSA, the following factors have been identified as a reason why the timber supply projected in the base case may have been underestimated:

- Area based tenures – exclusion of two unissued area based tenures from the THLB represents a 22 000-cubic metre per year or about one to two percent underestimation in the base case timber supply.
- Site productivity – not using the new provincial site productivity mapping in the base case results in a small, unquantified underestimation in the base case long-term harvest level.
- Stand regeneration – disregarding the potential for natural regeneration of unsalvaged dead pine stands results in an unquantified underestimation in the base case long-term harvest level.
- Log grade adjustments – not accounting for the contribution of dead potential volume in the base case results in about a five percent underestimation in the base case short- to mid-term harvest levels.
- Mountain pine beetle– not using the recently revised mountain pine beetle mortality estimates represents a 20 000 cubic metre per year or about two percent underestimation in the base case mid-term harvest level.

I have also identified factors in my considerations that indicate the timber supply projected in the base case was overestimated:

- Base case – the model used in the base case did not simulate harvest block patterns or spatial constraints, consequently the increased harvest flexibility in the model likely results in an unquantified overestimation in the base case harvest levels.
- Roads, trails and landings – the estimate used in the base case to account for future roads, trails and landings did not adequately represent the increase in road density resulting in an unquantified overestimation in the base case long-term harvest levels.
- Old growth management areas – the estimate of old growth management areas requiring salvage due to mountain pine beetle infestation is too high due to the collapse of the infestation and this results in about a one percent overestimation in the base case short-term harvest level.

- Non-recoverable losses – non-recoverable losses were underestimated by 15 000 cubic metres per year due to changes in the district’s small scale salvage program and this results in 0.8 percent, 1.7 percent and 0.9 percent overestimation of the base case short-, mid- and long-term harvest levels, respectively.

In considering the above-mentioned influences, I find that the combined effect of accounting for factors other than log grade adjustments represents a one percent overestimation of the short-term timber supply, two percent underestimation of the mid-term timber supply and a small unquantified underestimation of the long-term timber supply projected in the base case. Given the small magnitude of short- and long-term adjustments and the small but encouraging effect on an already depressed mid-term timber supply, I will not account for these factors further in this determination.

The underestimation of short- and mid-term timber supply due to log grade adjustments, while significant when considered independently, is not a reason to contemplate an increase in harvest levels when considered in the context of an already accelerated harvest rate. While I will not be specifically increasing short-term harvest levels due to this factor, I would clarify that my determination has fully considered and accounted for the log grade change. In any event, any dead potential volume harvested in the short term in place of live timber that is currently accounted for in the inventory will provide for a more robust timber supply in future. I will not consider this factor further in this determination.

In considering the information available to me for this determination, I am mindful of the timber supply dynamics demonstrated by the base case:

- The base case initial harvest can be supported for only seven years (2012-2018) by the continued salvage of available dead pine, dead spruce and incidental live trees within the salvaged stands.
- Beyond seven years, salvage opportunities diminish as the remaining killed pine no longer contributes to the timber supply due to being dead for longer than 15 years.
- The mid-term harvest level is restricted to about one half of the long-term sustainable harvest level due to a reliance on the limited availability of the remaining salvageable stands and limited availability of the mature stands that were not killed by the beetle infestations.
- Managed stands that are currently established will be the source of much of the timber supply for the later mid-term harvest.
- By the end of the mid-term, harvest levels will be able to climb to long-term sustainable levels based on the existence of managed stands that will be created by the regeneration of current and projected harvesting.

I am mindful of the base case and alternative harvest forecasts that demonstrated the sensitivity of the mid-term and long-term timber supply to the amount and type of harvesting in the short term:

- Immediately reducing the initial harvest level could make a small improvement to the mid-term but will adversely affect the long-term timber supply.
- Changing the short-term focus from salvaging high mortality stands to stands with low mortality and other species, will allow more live timber to be harvested, thereby resulting in significant reductions to the mid-term and long-term timber supplies.
- Continued harvesting in stands previously identified as problem forest types contributes significantly to the mid-term timber supply.

While considering the sensitivities described above, I am also mindful of and commend the efforts of licensees and district staff for their excellent work focusing the harvest on mountain pine beetle-affected pine stands. However, despite this demonstrated performance, I believe that a partition limiting the harvest of live timber is warranted to help mitigate the projected decrease in mid-term timber supply and to provide for other forest values. Institution of a live tree partition was also recommended by a licensee, a First Nation and FLNR staff during public review and First Nations consultation. In considering the appropriate level of a partition, I am mindful of information from the base case where 500 000 cubic metres of the initial harvest level is attributable to trees assumed to be live at the time of harvest.

I am mindful of the social and economic implications and the importance of supplying timber to keep the current mills operating as long as possible, while at the same time conserving and improving the future growing stock. I have considered the potential economic benefits of immediately reducing the cut in order to increase the mid-term timber supply and accepting a somewhat reduced long-term timber supply but the improvement is not large and the cost to the long term is not only in timber supply but also in a potentially diminished ability of future forests to provide other values and services such as habitat for moose and other wildlife.

I am aware of the potential increase in mid-term timber supply that might be possible if expanded utilization is implemented but I have not been provided with information that would substantiate performance or explain how the expanded standards can be implemented. If licensees wish to propose expanded utilization standards in the next timber supply review for the 100 Mile House TSA, they can work with district staff to determine how best to substantiate demonstrated performance and how to address any legal, policy and tenure administration issues.

I am mindful that the base case and sensitivity analyses demonstrate that projected harvest levels are highly dependent upon the length of time that beetle-killed pine trees continue to contribute to the timber supply. I recognize that the shelf life (time after death that timber remains commercially usable) can vary depending on the type of product being manufactured, milling technology, market conditions and the environmental conditions affecting how long dead pine trees remain standing. This and other uncertainties discussed in this document warrant the monitoring and reporting requested in '**Implementation**' and an earlier timber supply review than the maximum allowed by legislation.

I am aware of my obligation to consider and accommodate First Nations interests and concerns when determining the AAC for the 100 Mile House TSA. I note that although the base case did not specifically exclude areas to account for cultural heritage resources and other aboriginal interests, these areas often overlap with areas excluded to account for other forest values, such as riparian areas, wildlife habitat and old growth. In my determination, I have specifically considered the concerns raised by First Nations about the cumulative effect of timber harvesting on moose populations, watershed hydrology, food fisheries throughout my AAC determination. These concerns and the request received from First Nations have contributed to my decision to institute a partition in the AAC attributable to live timber.

Based on all of these considerations, I conclude that an AAC of 2.0 million cubic metres would allow the salvage of as much of the beetle-infested stands as possible; thereby, capturing the value of dead timber, keeping the current mills operating and improving future growing stock. However, I am also mindful that a harvest of 2.0 million cubic metres per year cannot be maintained for a full 10-year period without adversely impacting mid-term growing stock. In order to strike a balance between maximizing the salvage of dead timber and minimizing the risks to future timber supply and forest values, I have decided to establish a two-level AAC. For the first five years following this determination, the AAC will be 2.0 million cubic metres, of which a maximum of 500 000 cubic metres is attributable to live trees. Thereafter, the AAC will decrease

to 1.0 million cubic metres, of which a maximum of 500 000 cubic metres per year is attributable to live trees, until a new AAC is determined.

A harvest level of 1.0 million cubic metres will provide licensees with flexibility to continue salvage harvesting to the extent that the dead pine continues to be commercially usable. To address the evolving economics of shelf life, other uncertainties discussed in this document and potential impacts to other resources from accelerated harvest rates, my determination includes requests that district staff monitor, report and, if warranted, recommend the initiation of a new timber supply review earlier than the 10 years required by legislation.

## **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 the following AAC is necessary and appropriate to accommodate objectives for all forest resources, to reflect current management practices, address concerns identified by First Nations and to achieve the socio-economic objectives of the Crown:

- From November 7, 2013 to November 7, 2018, the AAC will be 2 000 000 cubic metres, of which no more than 500 000 cubic metres are attributable to live trees;
- After November 7, 2018 until the next determination, the AAC will be 1 000 000 cubic metres, of which no more than 500 000 cubic metres are attributable to live trees.

This determination is effective November 7, 2013 and will remain in effect until a new AAC is determined. Legislation requires a new AAC determination within 10 years of the effective date of this determination; however, I expect that this determination may need to be revisited in approximately five years after new information is available from harvest performance monitoring and other actions described below in '**Implementation**'. Annual reporting and recommendations from the district will inform the decision about when to initiate the next timber supply review.

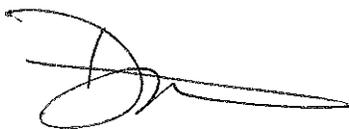
If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than indicated above.

## **Implementation**

In the period following this decision and leading to the subsequent AAC determination, I encourage FLNR staff and licensees to undertake or support the tasks noted below, the particular benefits of which are described in appropriate sections of this document. I recognize that the ability of staff and licensees to undertake or support these projects is dependent on available resources, including funding. These projects are, however, important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the 100 Mile House TSA.

- (i) I expect licensees to continue to focus harvesting as much as possible on mountain pine beetle-impacted pine-leading stands in the 100 Mile House TSA; to keep FLNR staff informed of the evolving economic viability of dead pine stands; and to harvest no more than their share of the AAC partition attributable to live tree volume.
- (ii) I request that district staff monitor the following and report annually to the chief forester:
  - harvest performance within dead stands and within the AAC partition attributable to live tree volume;

- the current and foreseeable economic viability of harvesting dead pine stands (i.e., the remaining shelf life);
  - the total volume of grade 4 credits (if the grade 4 credit is extended beyond June 1, 2014);
  - the effectiveness of waste administration practices to charge appropriate volumes to cut control;
  - an assessment of apparent risks to resource values or to the mid-term timber supply if grade 4 credits and/or waste administration result in harvest levels higher than contemplated in this AAC determination; and
  - a recommendation to initiate a new timber supply review if warranted.
- (iii) I expect district staff to make recommendations to the minister if a partition order appears to be necessary to implement the AAC partition.
- (iv) I request that district and FAIB staff use the results of the re-inventory along with monitored harvest performance to provide the next timber supply review with a better understanding of the actual deciduous inventory and the potential contribution of deciduous-leading stands to the mid-term timber supply.
- (v) I encourage the working group developing standardized approaches to silvicultural systems for Douglas-fir leading stands to complete that work and then confirm whether the standardized approaches reflect current practice in time to inform the next timber supply review.
- (vi) To improve management of the resource, I request that district staff supply the next timber supply review with better information about riparian reserves and lakeside management zones.
- (vii) To ensure that aboriginal concerns related to moose are addressed, I request that FLNR staff continue implementation of the moose habitat availability and suitability model and collect the information necessary to supply the next timber supply review with a better understanding of how harvesting rates affect moose populations.
- (viii) I request that district staff monitor regeneration status to be able to provide a reasonable level of confidence to the restocking rates used in the next timber supply review.
- (ix) I encourage FLNR staff to monitor whether young stands are meeting minimum stocking standards given the impact of the various forest health issues.



Diane Nicholls, RPF  
Deputy Chief Forester

November 7, 2013

## Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to October 23, 2013), 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 October 23, 2013) 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  
3<sup>rd</sup> 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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Location:  
Parliament Buildings  
Victoria BC V8V 1X4  
e-mail: FOR.Minister@gov.bc.ca



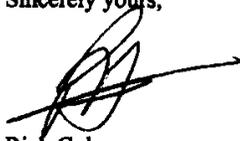
Jim Snetsinger

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.

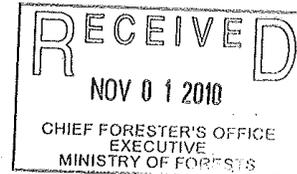
You should also consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

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  
3<sup>rd</sup> 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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Tel: (250) 387-6240  
Fax: (250) 387-1040  
Website:  
[gov.bc.ca/forlmbwww.gov.bc.ca](http://gov.bc.ca/forlmbwww.gov.bc.ca)

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