

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

# **Cranbrook Timber Supply Area**

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

**August 24, 2017**

**Diane Nicholls, RPF  
Chief Forester**

## Table of Contents

Objective of this document .....	1
Acknowledgement.....	1
Statutory framework.....	1
Description of the Cranbrook Timber Supply Area.....	1
History of the AAC for the Cranbrook TSA.....	2
New AAC determination.....	3
Information sources used in the AAC determination.....	3
Role and limitations of the technical information used .....	5
The role of the base case.....	8
Base case for the Cranbrook TSA.....	9
Consideration of Factors as Required by Section 8 of the <i>Forest Act</i> .....	10
Land base contributing to timber harvesting.....	10
- general comments .....	10
- land not administered by the Crown for TSA timber supply .....	12
- areas considered inoperable.....	12
- steep slopes.....	12
- non-merchantable forest types .....	14
- problem forest types .....	14
- roads, trails and landings .....	15
Existing forest inventory .....	16
- volume estimates for managed stands.....	16
- log grade changes .....	17
Expected time to re-establish the forest following denudation.....	17
- regeneration delay.....	17
Utilization.....	18
- residual waste.....	18
- grade 4 .....	19
Integrated resource management objectives.....	19
- land use plan .....	20
- landscape level biodiversity.....	20
- riparian areas .....	21
- fire maintained ecosystem restoration .....	22
- identified wildlife and ungulate winter range.....	22
- cultural heritage resources areas .....	24

Other Information .....	25
- harvest performance.....	25
- forest stewardship council certification .....	25
- First Nations consultation .....	26
- climate change .....	27
- cumulative effects .....	28
Alternative rates of harvesting .....	30
- alternative harvest forecasts.....	30
Economic and social objectives .....	31
- Minister’s letters .....	31
- local objectives .....	31
Abnormal infestations .....	32
- mountain pine beetle.....	32
- non-recoverable losses.....	32
Reasons for Decision .....	33
Determination.....	35
Implementation .....	35
Appendix 1: Section 8 of the <i>Forest Act</i> .....	37
Appendix 2: Section 4 of the <i>Ministry of Forests and Range Act</i> .....	40
Appendix 3: Minister’s letter of July 4, 2006.....	41
Appendix 4: Minister’s letter of October 27, 2010.....	43

**List of Tables**

Table 1. Factors accepted as modelled .....	11
---	----

## **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 Cranbrook 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, Natural Resource Operations and Rural Development, referred to throughout this document as the “the Ministry”, in the Rocky Mountain Natural Resource District, and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to local residents, First Nations, and stakeholders who contributed to this process.

## **Statutory framework**

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

## **Description of the Cranbrook Timber Supply Area**

The Cranbrook TSA is within the Rocky Mountain Natural Resource District of the Kootenay-Boundary Natural Resource Region and is administered out of the district office in Cranbrook. The Rocky Mountain Natural Resource District is situated in the southeastern corner of British Columbia and was created in 2003 by amalgamating the old Invermere and Cranbrook Forest Districts. The district contains approximately 2.63 million hectares, of which 1.24 million hectares falls within the Cranbrook TSA.

The Cranbrook TSA is bounded by the Skookumchuck Valley to the north, the Canada–U.S. border to the south, the Alberta border to the east, and the southern Purcell Mountains height-of-land to the west. Three major physiographic regions characterize the varied terrain of the Cranbrook TSA: the Rocky Mountains in the east, the Purcell Mountains in the west, and the Rocky Mountain Trench in the middle. The Trench varies in width from five kilometers in the north to 27 kilometers near Cranbrook. The western side of the trench features irregular, comparatively low foothills gradually rising until they merge with the extremely rugged backbone of the Purcell Mountains. In contrast, the eastern side of the trench is characterized by an abrupt rise and continuous wall of mountains broken only by tributary valleys.

According to the 2011 Canadian Census, the total population of the TSA is approximately 45 960 residents, with the largest populations located in Cranbrook, Kimberley, Fernie, Sparwood and Elkford. Smaller rural communities are located outside of the municipalities and along the TSA highway networks.

The member bands of two First Nation Councils have territories that encompass areas within the Cranbrook TSA: the Ktunaxa Nation Council (KNC) and the Shuswap Nation Tribal Council (SNTC). The ?Aq’am community located northeast of Cranbrook and the Tobacco Plains Indian Band located southeast of Cranbrook are members of the KNC. The Shuswap Indian Band, who is a member of the SNTC, has a community located north of Cranbrook at Invermere.

According to the 2006 economic dependency estimates provided by BC STATS the main sources of employment in the Rocky Mountain Natural Resource District are the public sector (27 percent), tourism (23 percent), mining (16 percent), construction (14 percent) and forestry (12 percent). Since then, employment in the timber processing sector has decreased. The decrease was largely due to the closure of the Tembec planer mill in 2010 and Canfor's Canal Flats sawmill in 2015.

The Kootenay-Boundary Higher Level Plan Order, which came into effect October 2002, provides legal land use direction for the Cranbrook TSA. The order established resource management objectives for biodiversity, old and mature forest, caribou, green-up, grizzly bear and connectivity corridors, consumptive use streams, enhanced resource development zones for timber, fire-maintained ecosystems, visual quality, and social and economic stability. Forest licensees are legally required to prepare Forest Stewardship Plans that meet these objectives.

The diverse landscapes in the TSA provide habitat for a wide range of wildlife species. Ungulate winter ranges have been established for the protection of white-tailed deer, mule deer, moose, elk, bighorn sheep and mountain goat habitat. In addition, wildlife habitat areas with general wildlife measures have been established for Rocky Mountain Tailed Frog, Long Billed Curlew, Flammulated Owl, Lewis's Woodpecker, Badger, Williamson's Sapsucker, Western Screech Owl, Antelope Brush/Bluebunch Wheatgrass, Douglas-fir/Snowberry/Balsam Root and Gillette's Checkerspot.

The Cranbrook TSA offers many and varied opportunities for recreation and tourism, due to its lakes, parks and spectacular mountains. The area is well travelled as major highways provide access to Alberta and the national and provincial parks in the Canadian Rockies. Within the Cranbrook TSA, there are the Akamina-Kishinena, Elk Lakes, and Gilnockie Provincial Parks as well as numerous smaller parks and recreation areas and portions of the Purcell Wilderness Conservancy, Height of the Rockies Provincial Park, and Top of the World Provincial Park. Numerous watersheds are classified as either domestic or community watersheds.

## **History of the AAC for the Cranbrook TSA**

In 1981, the AAC for the Cranbrook TSA was set at 900 000 cubic metres. This AAC stayed constant through a 1985 review until 1987 when the AAC was reduced to 873 810 cubic metres. This reduction reflected a land transfer from the former Cranbrook Forest District to the former Invermere Forest District.

Temporary AAC increases to account for salvage of mountain pine beetle killed trees occurred in 1990 (one-year increase of 376 000 cubic metres), 1991 (two-year increase of 284 000 cubic metres per year) and 1993 (one-year increase of 20 000 cubic metres). In 1995, the AAC increased to 900 947 cubic metres due to the land area of TFL 13 and its associated AAC of 27 137 cubic metres being added to the Cranbrook TSA.

In 1996, the chief forester decreased the AAC to 850 000 cubic metres. In 2001 it was increased again to 871 000 cubic metres which was composed of 838 000 cubic metres of conventional timber and 33 000 cubic metres from marginally economic sites. In 2004, the AAC was further increased by 70 000 cubic metres per year for three years to address fire damaged stands resulting in a total AAC of 941 000 cubic metres per year.

On November 5, 2005 the chief forester determined an AAC of 974 000 cubic metres which maintained the partitions of 70 000 cubic metres for fire salvage and the 33 000 cubic metres from marginally economic sites. The determination also added a new partition of 33 000 cubic metres to allow for ecosystem restoration of fire maintained ecosystems and to facilitate the district small

salvage program. Subsequently in 2007, the three-year increase for fire damaged stands expired and the AAC decreased by 70 000 cubic metres, resulting in an AAC of 904 000 cubic metres. A postponement was ordered in 2008 that maintained the AAC at 904 000 cubic metres. This is the level in effect at the time of this determination and is referred to throughout this document as the “current AAC”.

## **New AAC determination**

Effective August 24, 2017, the new AAC for the Cranbrook TSA is 808 000 cubic metres which is a 10.6 percent decrease from the current AAC. This AAC will remain in effect until a new AAC is determined, which must take place within 10 years of this determination.

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

In addition to other information sources in the specific factors that I address in this AAC rationale document, sources of information include but are not limited to, the following:

- *Kootenay-Boundary Higher Level Plan Order*. BC Ministry of Sustainable Resource Management, October 2002, and variances.
- *Kootenay-Boundary Land Use Plan Implementation Strategy*, Kootenay Inter-Agency Management Committee, 1997.
- *Southern Rocky Mountain Management Plan*, BC Ministry of Sustainable Resource Management, 2003.
- *Cranbrook Timber Supply Area Timber Supply Review Data Package*, FLNRO, FAIB, October 2015.
- *Cranbrook Timber Supply Discussion Paper*, FLNRO, FAIB, July 2015.
- *Cranbrook TSA Inventory Audit*, Ministry of Forests Resource Inventory Branch, 1999.
- Letters from the Minister of Forests to the chief forester, dated July 4, 2006 and October 27, 2010, stating the Crown’s economic and social objectives for the province.
- Letter from the Regional Ecologist to the Director FAIB, June 3, 2015 approving the use of the SIBEC and PEM estimates for use in the TSR.
- *Provincial Timber Management Goals and Objectives*, Ministry of Forests, Lands and Natural Resource Operations, May 26, 2014.
- *Riparian Management Area Classification for Cranbrook Forest District*, GeoSense, March 1998.
- *Cranbrook Forest District Problem Forest Type Summary Report*, BC Ministry of Forests, July 1998.
- *Identified Wildlife Management Strategy*, Volume 1, Province of BC, February 1999.
- *Forest and Range Practices Act 2002 and Amendments*.
- *Forest Practices Code of British Columbia Act Regulations and Amendments*, consolidated to June 1999.
- *Cranbrook TSA Rationale for AAC Determination*, January 7, 2004.

- *Landscape Unit Planning Guide*, 2000.
- Roads, Trails and Landings Inventory Project within the Cranbrook Timber Supply Area, Timberline Natural Resource Group, March 15, 2008.
- B.C. Ministry of Forests. 1998. Procedures for Factoring Visual Resources into Timber Supply Analyses. Timber Supply Branch.
- B.C. Ministry of Forests. 2000. Timber Supply Review, Cranbrook Timber Supply Area Data Package. Timber Supply Branch.
- B.C. Ministry of Forests. 2000. Timber Supply Review, Cranbrook Timber Supply Area Analysis Report. Timber Supply Branch.
- BC Ministry of Forests (March 2003) BC Heartlands Economic Strategy - The Forestry Revitalization Plan.
- British Columbia. 2014. *Forest Act*. See Section 8 Allowable annual cut [www.bclaws.ca/civix/document/id/complete/statreg/96157\\_02](http://www.bclaws.ca/civix/document/id/complete/statreg/96157_02)
- British Columbia. 2014. *Forest and Range Practices Act*. See [www.bclaws.ca/civix/document/id/complete/statreg/02069\\_01](http://www.bclaws.ca/civix/document/id/complete/statreg/02069_01)
- British Columbia. 2014. Forest Planning and Practices Regulation. See [www.bclaws.ca/civix/document/id/complete/statreg/14\\_2004](http://www.bclaws.ca/civix/document/id/complete/statreg/14_2004)
- British Columbia. 2014. Government Actions Regulation. See [www.bclaws.ca/civix/document/id/complete/statreg/582\\_2004](http://www.bclaws.ca/civix/document/id/complete/statreg/582_2004)
- Chen, H. and A. Walton. 2015. *Monitoring harvest activity across 28 mountain pine beetle impacted management units*. Forest Analysis and Inventory Branch, Ministry of Forests, Lands and Natural Resource Operations, Victoria BC.
- Ministry of Environment. Identified Wildlife Management Strategy. See [www.env.gov.bc.ca/wld/frpa/iwms/index.html](http://www.env.gov.bc.ca/wld/frpa/iwms/index.html)
- Ministry of Environment. BC Species and Ecosystems Explorer. See <http://a100.gov.bc.ca/pub/eswp/>
- Ministry of Environment. Mountain Caribou Recovery. See [www.env.gov.bc.ca/wld/speciesconservation/mc/index.html](http://www.env.gov.bc.ca/wld/speciesconservation/mc/index.html)
- Ministry of Environment. Ungulate winter ranges. See [www.env.gov.bc.ca/wld/frpa/uwr/](http://www.env.gov.bc.ca/wld/frpa/uwr/)
- Ministry of Forests. 1995. *Biodiversity guidebook*. See [www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/biodiv/biotoc.htm](http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/biodiv/biotoc.htm)
- Ministry of Forests. 2009. Variable density yield projection. Volume 1 – VDYP7 Overview Version 2.0. Forest Analysis and Inventory Branch, Victoria, BC.
- Ministry of Forests, Lands and Natural Resource Operations. Provincial-level projection of the current mountain pine beetle outbreak. See [www.for.gov.bc.ca/hre/bcmapb/year12.htm](http://www.for.gov.bc.ca/hre/bcmapb/year12.htm)
- Ministry of Forests, Lands and Natural Resource Operations. Harvest Billing System (HBS). See [www.for.gov.bc.ca/hva/hbs/](http://www.for.gov.bc.ca/hva/hbs/)

- Ministry of Forests, Lands and Natural Resource Operations. Wildlife Management Areas. See [www.env.gov.bc.ca/fw/habitat/conservation-lands/wma/](http://www.env.gov.bc.ca/fw/habitat/conservation-lands/wma/)
- Ministry of Forests, Lands and Natural Resource Operations. Archaeology in British Columbia. See [www.for.gov.bc.ca/archaeology/index.htm](http://www.for.gov.bc.ca/archaeology/index.htm)
- Ministry of Forests, Lands and Natural Resource Operations. Updated 2016. *Cranbrook Timber Supply Area Timber Supply Review Data Package*. May 2016. Victoria, BC.
- Ministry of Forests, Lands and Natural Resource Operations. Updated 2016. *Cranbrook Timber Supply Area Timber Supply Analysis Discussion Paper*. September 2016. Victoria, BC.

## **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. These inputs are concerned primarily with biophysical factors—such as the rate of timber growth and the definition of the land base considered available for timber harvesting—and with management practices.

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

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

In determining this AAC for the Cranbrook TSA I have considered the 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 my approach in these matters explicit, I have considered and adopted the following body of guiding principles, which have been developed over time by BC's chief foresters and deputy chief foresters. However, in any specific circumstance in a determination where I consider it necessary to deviate from these principles, I will explain my reasoning in detail.

When considering the factors required under Section 8, I am also mindful of my obligation as a steward of the forests of British Columbia, of the mandate of the Ministry as set out in Section 4 of the

*Ministry of Forests and Range Act*, and of my responsibilities under the *Forest Act* and *Forest and Range Practices Act (FRPA)*.

### Integrated decision making

One of the key purposes of the Ministry is to plan the use of forest and range resources such that the various natural resource values are coordinated and integrated. In addressing the factors outlined in Section 8 of the *Forest Act*, I will 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, nor is it possible at this time to speculate about the possible effect on timber supply that could result from possible eventual legal proof of Aboriginal title. 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 *Forest and Range Practices Act*. In cases where there is a clear intent by government to implement these decisions that have not yet been finalized, I will consider information that is relevant to the decision in a manner that is appropriate to the circumstance. The requirement for regular AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

Where appropriate, 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.

I 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, I believe that no responsible AAC determination can be made solely on the basis of a response to uncertainty.

Nevertheless, in making a determination, allowances may need to be made to address risks that arise because of uncertainty by applying judgment to the available information. Where appropriate, the social and economic interests of the government, 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, I 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, I will consider related information in my 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.

I 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 mountain pine beetle (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. I 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

Established (declared) Aboriginal title lands and other areas, such as Treaty Settlement Lands or Indian Reserves, are not provincial Crown land. Consequently, the timber on these lands does not contribute to the AAC of the timber supply area or tree farm licence with which they overlap. For other areas, where Aboriginal title has not been legally proven, the Crown has a constitutional obligation to consult with First Nations regarding their asserted Aboriginal 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 through engagement and consultation respecting First Nations' Treaty rights or Aboriginal Interests, including how these rights or interests may be impacted; and
- (iii) any operational plans and/or other information that describe how First Nations' Treaty rights or Aboriginal Interests are addressed through specific actions and forest practices.

Treaty rights or 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 scope of statutory authority, 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 AAC 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, Natural Resource Operations and Rural Development 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 Timber Supply Review Program (TSR) for TSAs and TFLs.

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

From a range of possible forecasts, one is chosen in which an attempt is made to avoid both excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the *base case* 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, demonstrated performance and legal requirements.

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

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

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

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

## **Base case for the Cranbrook TSA**

The timber supply forecasts, including the base case, were prepared for this determination using Remsoft's Woodstock Model. The data and assumptions used in the base case are intended to reflect current legal requirements, the best available information, demonstrated forest management practices and current conditions in the Cranbrook TSA as documented in the data package, as updated May 2016.

Harvest level projections, even those prepared using the same information, data and timber supply model, are dependent on the harvest flow objectives used in the analysis. The harvest flow objectives used in preparing the base case for this determination include:

- achieve the maximum non-declining even flow harvest forecast;
- for the first ten years maintain at least 60 percent of the total harvest volume from pine; and
- priority on the restoration of fire maintained ecosystem areas.

The Minister of Forests and Range, in a letter dated October 27, 2010 provided the Crown's objectives with respect to mid-term timber supply in areas affected by MPB. Direction was provided to mitigate mid-term timber supply shortfalls to support the wellbeing of forest-dependent

communities. It is for this reason the base case is modelled as a sustained harvest level that maintains the highest possible mid-term level.

The spread of MPB was not modelled in the base case as the infestation has now subsided. The licensees have promptly harvested infested stands which further helped to reduce the spread of the infestation. Any remaining minor damage to stands is accounted for in the yield projections.

The base case begins in 2014 and maintains a harvest level of 824 700 cubic metres per year through the entire forecast. This level is 8.6 percent lower than the current AAC. In addition to the base case, I was provided with a number of sensitivity analyses and alternative harvest forecasts carried out using the base case as a reference. These analyses and others as noted have been helpful in specific considerations and reasoning in my determination as documented in the following sections.

I am satisfied that the base case, and the other analyses as noted and described, represent the best information currently available to me respecting various aspects of the projection of the timber supply in this TSA, and that as such they are suitable for reference in my considerations in this determination.

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

I have reviewed the information for all of the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case is a reasonable reflection of current legal requirements, demonstrated forest management and 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 1.

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 that led to my conclusions.

**Section 8 (8) In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider**

- (a) **the rate of timber production that may be sustained on the area, taking into account**
  - (i) **the composition of the forest and its expected rate of growth on the area**

#### Land base contributing to timber harvesting

##### *- general comments*

The total area within the boundary of the Cranbrook TSA is 1 484 998 hectares. Excluding areas under area-based tenures, private land, areas not managed by the Crown for timber supply, non-productive land, and existing roads, the area of Crown forest management land base (CFMLB) is 782 474 hectares. Not all of this area is included in the THLB.

The THLB is a coarse estimate of the area available for timber production, at a single point in time, after areas reserved from harvesting for economic, cultural, ecological or other factors have been excluded. The areas reserved may be determined based on legal requirements with defined boundaries or may be modelled surrogates for legal requirements or current practices. Because the THLB is an estimate derived for the purpose of timber supply modelling, the operational reality of whether a specific area will be harvested or not may differ.

*Table 1. 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 and its expected rate of growth	<ul style="list-style-type: none"> <li>• Non-forest land</li> <li>• Non-commercial cover</li> <li>• Environmentally sensitive areas</li> <li>• Unstable terrain</li> <li>• Low productivity sites</li> <li>• Forest inventory</li> <li>• Volume estimates for natural stands</li> <li>• Site productivity estimates</li> <li>• Genetic gains</li> <li>• Minimum harvest criteria</li> <li>• Operational adjustment factors</li> </ul>
8(8)(a)(ii) Expected time that it will take the forest to become re-established following denudation	<ul style="list-style-type: none"> <li>• Not satisfactorily restocked</li> </ul>
8(8)(a)(iii) Silvicultural treatments to be applied	<ul style="list-style-type: none"> <li>• Silvicultural systems</li> </ul>
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	<ul style="list-style-type: none"> <li>• Utilization standards</li> </ul>
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	<ul style="list-style-type: none"> <li>• Stand-level biodiversity</li> <li>• Scenic resources</li> <li>• Green-up and adjacency</li> <li>• Ungulate winter range</li> <li>• Wildlife habitat areas</li> <li>• Community and domestic watersheds</li> </ul>
8(8)(a)(vi) Any other information	
8(8)(b) The short and long term implications to British Columbia of alternative rates of timber harvesting from the area	
8(8)(d) Economic and social objectives of the government	<ul style="list-style-type: none"> <li>• Summary of public input</li> </ul>
8(8)(e) Abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	<ul style="list-style-type: none"> <li>• Other forest health issues</li> <li>• Disturbance outside the timber harvesting land base</li> </ul>

The THLB used in the base case is 351 773 hectares which is 13 percent smaller than the 416 196 hectares used in the previous timber supply review. This decrease is due to the establishment of new wildlife habitat areas in which logging is prohibited and changes in modelling assumptions. These changes include: accounting for landscape biodiversity requirements as an area reduction (i.e., old

growth management areas) instead of a model constraint (i.e., old seral requirements); accounting for wildlife tree patches as an area reduction instead of a combination of area and volume reductions; and the exclusion of half of the area on slopes between 40 percent and 70 percent where previously no reduction was made.

*- land not administered by the Crown for TSA timber supply*

As part of the process used to define the THLB in the timber supply analysis, areas that are not administered by the Crown for TSA timber supply are excluded from the CFMLB. A review of the process used for this analysis found that 1307 hectares of private managed forest land had been incorrectly included in the THLB. This small area accounts for approximately 0.4 percent of the THLB and likely resulted in an overestimation of the base case timber supply of the same magnitude. Having considered this information, I acknowledge this overestimation and I will account for it in my determination as discussed in **‘Reasons for Decision’**.

*- areas considered inoperable*

Those portions of the TSA that are neither physically operable nor economically feasible to harvest are categorized as inoperable, and are excluded from the THLB. For the Cranbrook TSA, operability mapping was originally completed in 1987 and was revised in 2003.

Based on a review of harvesting since 2003, district staff indicate that the 2003 operability mapping still provides a good estimate of the operable area in the TSA. Using this information, 193 891 hectares was considered inoperable and was excluded from the THLB.

Public input included a recommendation that there be a discussion to define a clear, mapped delineation of the line between the harvestable land base and inoperable high elevation areas. The comments noted that high elevation stands support many values that should be considered when defining the upper limit to harvesting.

With respect to this comment, I note that operability mapping only provides an estimate of the area in which harvesting may occur based on physical accessibility and economic factors. It does not dictate where, how or even if timber harvesting is going to occur. Furthermore, any future development of high elevation harvesting has to be consistent with the *Forest and Range Practices Act* and the land use decisions that have been made by government.

I accept that the best available information was used to identify and exclude inoperable areas from the THLB and make no adjustments to the base case on account of this public input.

*- steep slopes*

District staff are concerned about harvest performance on steep slopes and have completed a review of the location of harvesting in the TSA over the last ten years for consideration in the timber supply analysis. The review included a spatial analysis of the approved cutting permits from 2003 to 2013 compared to terrain slope mapping. Based on this review all areas on slopes greater than 70 percent (class 3) and half of the areas on slopes between 40 percent and 70 percent (class 2) were excluded from the THLB in the base case. Application of these operability criteria resulted in the exclusion of a net area of 43 248 hectares from the THLB.

In addition to the above spatial analysis, district staff reviewed information from the Ministry’s Electronic Commerce Appraisal System (ECAS) to determine how much of the licensee reported

volume between 2006 and 2015 qualified for the cable appraisal allowance. The results demonstrated that 48.4 percent of the volume harvested within class 2 slopes was cable based.

During the public review, I received comments from forest industry and the general public around the steep slope modelling assumptions.

BC Timber Sales (BCTS) acknowledged that poor markets and reduced cable-logging capacity have led to decreased harvesting on steeper slopes. However, BCTS recommended that the steep slope criteria should remain unchanged from the previous timber supply review when only class 3 areas were excluded from the THLB.

Canfor, who holds a replaceable forest licence in the TSA, noted that although the steep slope criteria reflect the last ten years of harvest performance it is working to build steep slope harvesting capacity. According to Canfor, its Elko/Wynnwood Operations currently have the capacity to harvest 130 000 cubic metres per year from steep slopes and it expects to increase this to 210 000 cubic metres per year in two years. Canfor expects that it will be able to handle all steep slopes, including those greater than 70 percent. On the basis of this information, Canfor contends that steep slopes should not be removed from the THLB and, as a result, the base case underestimates timber supply.

Summit Valley Contracting Ltd., a forestry consulting company based in Invermere, recommended including all of class 2 areas and the institution of a partition of the AAC for the volume from steep slopes. This approach would provide greater opportunity to support the local sawmill.

Wildsight, a non-government conservation organization, noted that harvesting has, until recently, been concentrated on pine stands in low- to mid-elevation areas. The steep slope criteria used were considered to be overly optimistic and not consistent with Wildsight's observations.

In sensitivity analysis, inclusion of all class 2 slope area in the THLB resulted in a harvest level 9.1 percent above the base case level. Conversely, excluding all class 2 slope area from the THLB resulted in a harvest level 9.8 percent below the base case level.

I have considered the input received regarding this factor and I note that the steep slope criteria used in the analysis were validated by staff using a spatial analysis of harvested cut blocks. I conclude that the steep slope criteria reasonably reflect demonstrated performance and I will make no adjustments to the base case on this account in my decision.

I commend the harvest performance demonstrated by the licensees in effectively targeting MPB killed stands over the past ten years. I also recognize that this harvest strategy has restricted harvest to certain stand types and portions of the TSA. This has resulted in a disproportionate accumulation of harvest on flatter terrain areas where the MPB infested stand types generally occur. However, the sensitivity analyses presented to me clearly show that the base case harvest level can only be achieved if future harvesting resumes a distribution that matches the terrain profile of the THLB.

I appreciate the commitment made by Canfor to work to build steep slope harvesting capacity and I recognize that the need for other harvest priorities such as ecological restoration, fire and forest health management that will require continued harvest in flatter terrain areas. However, considering the degree to which the sustainability of my AAC decision is reliant on future harvesting resuming on steep slopes, I have instructed under **'Implementation'** that district staff monitor steep slope harvest performance and report this information to me annually. Further, if district staff express concern that harvest performance does not meet or exceed the levels assumed in the base case, I will consider instituting a partition in the AAC attributable to steep slopes, or revisiting this determination earlier than required in legislation.

*- non-merchantable forest types*

In the base case, a total of 6882 hectares were excluded from the THLB to account for non-merchantable forest types. The exclusions included all deciduous and whitebark pine stands which are considered uneconomic to harvest, and western redcedar, western hemlock and subalpine fir stands older than 200 years that are rarely merchantable. District staff concur that these exclusions reflect current management but note that some whitebark pine is being harvested as a minor species in other stand types.

I am aware that approximately 12 000 hectares of balsam “intermediate utilisation” (IU) stands were included in the THLB. Balsam IU stands are the legacy of harvesting that occurred in the 1950’s, 1960’s and 1970’s in which only the high value mature spruce component of the stands was removed making the residual stands marginally economic to harvest. Although the yield forecasts account for lower crown closure, the volume of these stands may be overestimated because the trees are growing in uneven-aged stand conditions, and past logging may have included higher than normal trail densities and damaged residual stems.

Comments received from Wildsight suggested that the non-merchantable exclusion criteria for old redcedar and hemlock stands should be reduced to 80 years from 200 years. The group also expressed concern over the observed harvest of whitebark pine given that it is an endangered species under the federal *Species At Risk Act*.

The Southern Guide and Outfitters expressed concern regarding the small proportion of deciduous leading stands in the Cranbrook TSA. They conveyed that deciduous trees are extremely important for wildlife and the loss of aspen and grassland habitat types is a major concern to the guide and outfitter industry. District staff inform me that aspen was historically removed as a non-crop tree in the TSA but it is now retained where feasible in wildlife tree retention areas.

I am reassured to learn that the habitat values provided by mature aspen are being promoted through the placement of wildlife tree retention areas. However, I am concerned regarding the incidental harvest of whitebark pine even if it is a minor component of the stand. As indicated under ‘**Implementation**’, I expect licensees to remain vigilant in identifying stands where this species grows and make every effort to minimize the incidental harvest of this species. As well, I expect licensees to maintain the practise of leaving deciduous tree stands as much as possible for the wildlife habitat values.

I note that the proportion of the area excluded composed of redcedar and hemlock leading stands is so small that changing the age criteria from 200 years to 80 years would have an insignificant effect on the base case. I accept that the criteria used to identify these non-merchantable forest types reasonably reflects current practice and is appropriately modelled in the base case.

The balsam IU stands accounted for approximately 3.3 percent of the THLB area but only made a minor contribution to the base case due to their low modelled yields. Nevertheless, to clarify this issue, I have included a direction under ‘**Implementation**’ that improved information for these stands be collected for use in the next timber supply review. I also expect that licensees make all efforts to harvest and rehabilitate these stands in order to ensure a sustainable future AAC.

*- problem forest types*

In the Cranbrook TSA, moderately dense lodgepole-pine leading stands in which stand density has caused suppressed tree growth are considered a problem forest type. In the base case: 80 percent of lodgepole pine-leading stands older than 40 years with heights less than 10.5 metres (class 1); 35 percent of lodgepole pine-leading stands 41 to 60 years with heights of 16 metres (class 2);

18 percent of lodgepole pine leading stands 61 to 80 years with heights of 16 metres (class 3); and 29 percent of lodgepole pine leading stands older than 80 years with heights of 1 metre (class 4) were considered to be problem forests and were excluded from the THLB.

Ten percent of class 2, 24 percent of class 3 and 57 percent of class 4 stands were included in the THLB but were modelled with extended harvest rotations to account for their slower rate of growth.

In the 2001 determination, the AAC included a 33 000 cubic metre partition associated with problem forests from marginal stands outside the timber harvesting land base. The partition was created to encourage opportunities to rehabilitate dense pine stands and provide harvest opportunities for post and rail products. At the time of the 2005 determination, some harvesting had begun in these stands so the partition was maintained to encourage continued performance. However, district staff inform me that harvesting did not continue and only approximately 200 hectares have been harvested from the problem forest types since the creation of the partition. Problem forest types tend to occur in pockets that are often incorporated into wildlife tree retention areas or other long-term reserves during forest operations. Consequently, district staff indicate that these stand types should have been fully excluded from the THLB.

In comments received from the Public Discussion Paper, Canfor provided examples of work completed with non-replaceable tenure holders to utilize problem forest types. The comments suggested that with recent increases in fibre demand the opportunity to incorporate these stands into harvest operations would also increase. Canfor suggested that existing partition should remain in place to continue to provide incentive to target these stand types. District staff responded that after 15 years with no significant harvest performance it would be difficult to recommend extending the partition.

Wildsight also commented that there has been little to no harvest performance in the problem forest types to date and suggested that these stands should have been excluded from the THLB.

In a sensitivity analysis, fully excluding the class 1 to 4 problem forest types resulted in a harvest level seven percent lower than in the base case.

I have considered the information and input received on problem forest types and agree that in the absence of demonstrated harvest performance, all stands within classes 1-4 should have been excluded from the THLB. On this basis, I conclude that the base case timber supply has been overestimated by seven percent and I will account for this in my determination as discussed in '**Reasons for Decision**'.

*- roads, trails and landings*

Separate estimates were made to reflect the loss in productive forest land due to existing roads, trails and landings (RTL) and those that will be constructed in the future. The estimates were based on the Timberline Natural Resource Group report, *Roads, Trails and Landings Inventory Project within the Cranbrook Timber Supply Area (2008)*, which provided the reduction values applied in the base case. District staff inform me that the 2008 report is the best available information for use in the base case.

Existing RTL estimates were applied only to the area with a history of harvesting and therefore established road access. Future RTL reductions were applied after stands were harvested for the first time in the timber supply model.

In the base case, 13 698 hectares and 7154 hectares, were uniquely excluded from the THLB to account for existing and future roads, respectively.

During the public review, the Backcountry Hunters and Anglers commented that over the last decade the East Kootenays have experienced a rapid growth of resource roads that have adversely affected wildlife. The group recommended: completion of a road and linear disturbance inventory; adoption of

a no net increase in road density policy; the establishment road density guidelines; limits for maximum allowable road density; and modification of the appraisal system such that companies would not be reimbursed road construction costs if the maximum allowable road density has been exceeded and would be required to pay for the deconstruction and reclamation of roads (in excess of the maximum). In order to reduce access to high elevation grasslands and alpine habitat the group also recommended that all new roads within 500 metres of such areas be deconstructed and reclaimed.

Similar comments were received from the Southern Guides and Outfitters who recommended that a higher percentage of roads be reclaimed.

Regional Ministry staff also expressed concern regarding the increased development of both forestry and non-forestry roads and indicate that efforts are currently underway in the Kootenay Boundary Region to strategically reduce road densities in areas of greatest benefit to wildlife habitats. While I appreciate the recommendations provided by the Backcountry Hunters and Anglers and Southern Guides and Outfitters, the specific requests for policy direction and legislative changes to address road density are not within the legislated mandate of the chief forester. In this respect, I suggest the Ministry work with these groups and forest licensees to address wildlife habitats impacted by road densities and consider policy changes to enable road rehabilitation efforts. It is important that this work begins with a full understanding of the current status of road density in the TSA. Therefore, as described under '**Implementation**', it is my expectation that improved road inventory data be collected to support regional efforts to manage road density and also for use in the next timber supply analysis.

### Existing forest inventory

#### *- volume estimates for managed stands*

In the base case, all stands harvested from 1982 onward are considered to be managed stands and were modelled with yield projections that reflect the benefits of the regeneration silviculture that became regular practice at this time. Site productivity estimates used in the yield projections were based on the Ministry Site Index Estimates by BEC Site Series (SIBEC) project. These SIBEC estimates were not used in the analysis supporting the previous timber supply review since the ecosystem mapping required to apply SIBEC was not available at that time. Predictive Ecosystem Mapping has since been completed and it received approval for use in timber supply analysis after a provincial accuracy assessment was completed by the regional ecologist in 2015.

Comments received from Wildsight expressed the concern that forest health issues and animal damage can affect regenerating stand density in the TSA and potentially prevents stands from reaching the expected managed stand yields. The comments cited Stand Development Monitoring (SDM) carried out under the Forest and Range Evaluation Program (FREP) that found that many post free growing stands around the province were not growing as well as expected. District staff inform me that local SDM data will soon be available for the Cranbrook TSA. I am also aware of the Young Stand Monitoring (YSM) program being implemented throughout the province by inventory staff to check the growth and yield assumptions of key timber attributes (including stand net volume, site index, total, and species composition).

The managed stand yield projections were reviewed by district staff and were approved for use in the base case by analysis staff with growth and yield expertise. At this time there is little quantitative data to support the observation of density short-falls. Therefore, I conclude that the best available information was used in the base case and no accounting is required in respect to this factor. As indicated under '**Implementation**', I expect district staff to work with FAIB and Resource Practices

Branch staff to implement YSM and SDM monitoring programs that evaluate the performance of managed stands.

*- log grade changes*

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 less than 50 percent of lumber produced is merchantable) were not charged to the AAC if harvested. Under the new system, grades are based on log size and quality at the time the log is scaled, not simply whether it was alive or dead at harvest. To better account for all harvested volume in the AAC cut control, logs that were previously considered Grade 3 endemic or Grade 5 are now charged to the AAC. Therefore, this volume now needs to be taken into account in the AAC determination.

For the Cranbrook TSA, the best estimate of dead potential volume used by licencees can be obtained from the Ministry's Harvest Billing System (HBS). For the period 1995 to 2004, when dead potential volumes were not charged against the AAC, the HBS showed that grade 3 endemic and grade 5 log volumes totalled about 8.8 percent of the cut-accountable volume in the Cranbrook TSA.

Since the stand yield 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 harvest levels are underestimated by about 8.8 percent. 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-establish the forest following denudation

*- regeneration delay*

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings. The data required to generate managed stand yield projections were summarized from free-growing survey data collected from 8000 hectares of regenerated stands within the TSA recorded in RESULTS since 1993. Regeneration delay was calculated as the difference between the harvest completion year and the year of planting. The regeneration delay factored in the assumption that the planting stock would already be one year old. For all stand types the delay was modelled as two years except for poor pine sites which used a delay of three years.

After the timber supply analysis was completed, district staff expressed concern that the RESULTS data would not accurately reflect the regeneration difficulties experienced in some parts of the managed forest, in particular the Fire Maintained Ecosystem Restoration (FMER) areas. Frequent regeneration failures have been observed on some ecosystem types due to a combination of drought, cattle or ungulate damage, and disease. In these areas, given the high risk of western gall rust for pine and the poor performance of planted Douglas-fir, plans often specify natural regeneration of Douglas-fir, and thus a long regeneration delay.

Wildsight also noted that FMER areas are commonly left unplanted and suggested that a longer regeneration delay should be considered. Comments received from Galloway Lumber Company, who holds a replaceable forest licence in the TSA, state that achieving regeneration success in ten years is

challenging, given wildlife, cattle and disease issues within the FMER areas. A 15-year regeneration delay was recommended based on Galloway's current management practices and operational experiences.

A sensitivity analysis was presented in the Public Discussion Paper that applied a 15-year regeneration delay to the entire FMER area. However, district staff inform me that these difficult regeneration areas only constitute approximately 32 percent of the FMER area. In a revised sensitivity analysis, the 15-year regeneration delay was applied only to the difficult regeneration areas in the FMER area which resulted in a harvest level 1.6 percent below the base case level across the entire planning horizon.

District staff are satisfied with the regeneration delays modelled in the base case except for those used for areas in FMER. I conclude that the base case harvest level has been overestimated by 1.6 percent and I will account for this in my determination as discussed in '**Reasons for Decision**'.

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

No factors considered under this section require additional comment.

**Section 8 (8) (a) (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area:**

Utilization

*- residual waste*

The yield projections used in the base case are based upon provincial utilization standards and were reduced to account for the volume of wood lost to decay, waste and breakage. The decay, waste and breakage estimates of losses have been developed for different areas of the province based on field samples.

I am aware that licensees are allowed to leave waste on logging sites up to a benchmark volume. When the benchmark has been exceeded, waste is billed through stumpage charges and the excess volume is accounted towards the licensee's apportioned volume of the AAC.

District staff have received comments from local foresters and the public regarding a trend of increased logging waste observed over the last ten years. The trend has become more apparent in the last five years as harvest operations have transitioned to cut-to-length systems that optimize log size in the field prior to transport to the mill.

The Southern Guide and Outfitters expressed the opinion that the current level of waste or coarse woody debris left in many cut blocks is not acceptable. The group was largely concerned that the residual waste can act as an impediment to wildlife movement and can in some instances result in complete loss of habitat value.

The Ktunaxa Nation Council also expressed concern for the appropriate accounting of waste in the base case. District staff inform me that information on the process of waste reporting and auditing was provided in response. I expect that district staff will continue to work with the Ktunaxa Nation Council to address any further concerns that may remain.

District staff inform me that the majority of waste assessments submitted demonstrate that the level of avoidable waste is below benchmark thresholds set by the Province. The measurement and accounting

of waste is reflected in the process of AAC cut control and does not affect the assumptions regarding decay, waste and breakage in the base case.

The concern regarding increasing waste levels is not specific to the Cranbrook TSA and is a growing concern throughout the province. Regional staff inform me that an initiative is under way to improve estimates of waste and I urge district staff to participate. I am concerned that any underestimation of waste will result in an understatement of the volume accounted for under AAC cut control. This would allow for the unintentional harvest of additional volume and could jeopardize the sustainability of the AAC that I determine.

Licensees should also be aware of this issue as it has the potential to diminish mid-term timber supply. I encourage licensees to fully utilize the volume harvested and consider ways in which potential waste could be used in fibre based products, as described under **'Implementation'**

District staff are satisfied with the decay, waste and breakage factors used in the base case. I will therefore make no further accounting in respect to this factor in my decision.

- grade 4

Section 17 (6) of the Cut Control Regulation allows licensees to apply to have grade 4 logs that are delivered to a non-lumber or veneer facility not count towards the AAC volume attributed to their licence (this is often referred to simply as "grade 4 credit"). As this grade 4 credit volume is not accounted against any licence, this may enable the total harvest in a TSA to exceed the Section 8 AAC. Grade 4 logs were expected to be mostly from dead pine stands but can also include other species and be either live or dead.

In the Cranbrook TSA, the grade 4 credit is intended to provide an incentive to licensees to utilize low quality logs. A review of cut control information since 2007 shows that an average of 22 797 cubic metres per year, about 2.5 percent of the AAC, was attributed as grade 4 credits. District staff are concerned that this practice results in harvest levels that are higher than the AAC and creates sustainability issues. I share their concern and agree that if the practice of grade 4 credits continues the sustainability of the AAC that I determine may be jeopardized.

In 2014 the *Forest Act* and the Cut Control Regulation were amended to allow the minister to set a maximum volume limit on grade 4 timber that may be credited in a TFL or TSA in situations where sustainability of the timber supply is a concern. No maximum has been set for the Cranbrook TSA. As discussed under **'Implementation'**, I expect district staff to continue to monitor the volumes attributed to grade 4 credit, and in the event that the volume of grade 4 credits could result in harvesting above the level of the AAC that I determine, it is my expectation that staff will request that the Minister implement a maximum volume limit.

**Section 8 (8) (a) (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production:**

#### Integrated resource management objectives

The Ministry 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. Accordingly, the extent to which integrated resource management objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

*- land use plan*

Forest management in the Cranbrook TSA is subject to the East Kootenay Land-Use Plan completed in 1995, which established commercial resource use areas, new protected areas, and an economic strategy to mitigate the impacts resulting from plan implementation.

The Kootenay-Boundary Higher Level Plan Order (KBHLPO), which took effect on October 26, 2002, resulted in the legal establishment of 10 resource management objectives, including: biodiversity emphasis, old and mature forest, caribou, green-up requirements, grizzly bear habitat and connectivity corridors, consumptive use streams, enhanced resource development zones for timber, fire maintained ecosystems, visuals, and social and economic stability. In their Forest Stewardship Plan (FSP), licensees must specify results and strategies to meet these objectives.

District staff have reviewed the base case and are satisfied that the assumptions used appropriately reflect the requirements of the KBHLPO.

*- landscape level biodiversity*

Old seral stage forest retention is an important aspect of landscape-level biodiversity. Landscape units with biodiversity emphasis options and requirements for old and mature forest retention have been legally established and are specified in the KBHLPO.

Old growth management areas (OGMA) have been spatially located and mapped in the TSA but not all of the OGMAs are legally established. The non-legal OGMAs were modelled as permanently reserved from harvest in the base case. It was assumed that, at the strategic level, the non-legal OGMAs appropriately represent the area required to be retained to achieve the legal old seral retention targets even if their shape and location may be modified in the future.

District staff inform me that the non-legal OGMAs are being maintained as current practice by licensees to meet the KBHLPO old seral targets. The areas required to meet the KBHLPO mature plus old seral targets have not been spatially located. Licensees ensure these targets are being met by monitoring the inventory of stands within each seral stage by landscape unit.

The KBHLPO allows for old seral targets to be reduced to one-third within low biodiversity emphasis option areas. The target for old seral was incrementally increased over the model forecast to achieve the full target by the end of the third rotation.

District staff have reviewed the information and assumptions used in the base case and are satisfied that they reasonably reflect current legal requirements and management practices.

The Southern Guide and Outfitters inquired about the participation of stakeholders when candidate OGMA areas are being selected and asked if evaluations are performed to ensure that they are actually benefiting wildlife. District staff responded that through FRPA the professional reliance model promotes direct discussions between licensees and stakeholders when specific OGMA location and benefits are evaluated. I encourage Ministry staff to ensure that effective communication occurs between licensees and stakeholders through the continued process of establishing OGMAs.

The Ktunaxa Nation Council inquired if the mature and old seral targets are currently fully met. District staff responded that licensees have commitments made in their FSPs to follow KBHLPO and to track the current seral stage distribution of the land base and ensure that the seral stage thresholds are met.

District staff have noted that some non-legal OGMA's have been significantly impacted by wildfire in the last several years. The availability or identification of suitable replacement areas has not been investigated by district staff.

Based on the information provided to me and the expertise of Ministry staff I am satisfied that the base case appropriately accounts for landscape level biodiversity and OGMA requirements. Following this determination, it is my expectation that licensees will work in collaboration with the district to track OGMA's and uphold their designations within the Cranbrook TSA, as discussed in **'Implementation'**.

*- riparian areas*

Riparian areas bordering streams, lakes, and wetlands provide key habitat for fish and wildlife and help conserve water quality and biodiversity. The *Forest Planning and Practices Regulation (FPPR)* specifies requirements for riparian reserve zones (RRZs) which exclude timber harvesting, and riparian management zones (RMZs) which place limits on timber harvesting in order to protect riparian habitats.

Stream, wetland, and lakes classifications have been mapped for the TSA through several initiatives since 2000. Tree retention within the RMZ is guided by results and strategies within FSPs formulated by licensees. In the base case, an equivalent buffer was modelled for the RMZ and combined with the RRZ no harvest buffer; this produced an equivalent buffer area of 10 742 hectares that was excluded from harvesting in the base case. However, Ministry staff noticed after the base case was completed that incorrect buffers were inadvertently applied for lakes over 100 hectares instead of lakes over 1000 hectares in size. This error resulted in a very small unquantified overestimation of the area excluded from harvest for riparian areas.

Canfor currently has a Forest Stewardship Council (FSC) certification regime in place that guides its management practices including riparian management. Through this certification, Canfor voluntarily commits to higher riparian management requirements than those required under FRPA.

To understand the extent of the enhanced riparian management requirements, district staff analysed data collected through the Ministry's FREP monitoring program. Based on this review, staff concluded that if the FREP observations were inferred to represent current practice across the TSA, the area reserved from timber harvesting would decrease by 2000 hectares compared to the base case. This difference was likely the result of the overestimation of riparian reserves applied to lakes in the base case. However, due to the limited sample size and the difficulty in distinguishing between areas reserved from harvesting for riparian values and areas reserved for other values, such as wildlife tree areas and OGMA's, staff believe that the FREP data are not appropriate for use in the base case.

Comments received from Wildsight and the Ktunaxa Nation Council both expressed the opinion that the FSC certification regime should have been modelled as current practice in the base case.

With respect to the enhanced riparian management requirements under FSC certification, I note that these represent voluntary commitments on the part of some of the licensees operating in the Cranbrook TSA for which no legal mechanisms exist to ensure that the management practices are implemented and continued over time. District staff have observed that actual riparian management practices throughout the TSA do not always align with those recommended in the certification regime. Therefore, until such time as all licensees practice to the same standard or government recognizes the FSC riparian management requirements through amendments to FPPR or the establishment of new legal requirements, I will not consider them in my AAC determinations.

Based on my consideration of the information regarding riparian management in the Cranbrook TSA and how it was modelled in the base case, I accept that the area excluded from the THLB to account for riparian areas was overestimated by a small, unquantified amount due to incorrect buffers and I will account for this in my determination as discussed under '**Reasons for Decision**'.

*- fire maintained ecosystem restoration*

Decades of wildfire suppression has led to overly dense stands on sites that once provided open forest and open range conditions in the Rocky Mountain Trench. Under the authority of the Kootenay-Boundary Higher Level Plan for grass-growing areas these stands are currently managed for ecosystem restoration. The FMER area in the Rocky Mountain Natural Resource District is estimated to be 109 457 hectares, of which 62 050 hectares is open range and 47 406 hectares is open forest.

The KBLUP provides guidance for the restorations and maintenance of fire maintained ecosystems, and through treatments that contribute to the creation of a complex, ecologically appropriate mosaic of habitats over the long term. It specifies treatments in open range and open forest that will remove excessive immature and understory trees and emphasize the retention of the oldest and largest trees.

In the base case, open range areas were assumed to be available for harvest if they met the minimum harvestable criteria. After the initial harvest open range stands were removed from the THLB. Open forest areas were assumed to have an initial harvest entry that reduced stocking levels to historic low densities. These stands were then modelled with periodic low volume harvests in order to maintain the open forest attributes for range while providing timber volume.

Comments received from the Rocky Mountain Trench Society and Southern Guide Outfitters emphasized the importance of considering the restoration and maintenance of fire-maintained ecosystems when setting a new AAC. I note that the open forest areas were modelled with a yield projection and silviculture routine specific to the maintenance of the ecological and habitat values.

The Ktunaxa Nation Council also expressed concerns regarding the implementation of ecosystem restoration throughout their asserted traditional territory. I am aware that the Ministry has prepared a best management practices document to provide accepted guidance to planners and operators.

As I do not have the authority to direct specific harvest practices, I recommend that the Ktunaxa Nation Council work with licensees during the upcoming FSP renewal process to ensure the commitments, based on these best practices, address their concerns for management of fire-maintained ecosystems and the wildlife habitat values they provide, as discussed under '**Implementation**'.

The current AAC includes a 20 000 cubic metre partition attributed to FMER areas (combined with 13 000 cubic metres attributed to small scale salvage) to encourage initial restoration harvesting. District staff have observed that in the past five years harvest levels have increased in these stands which is augmenting the total area of open range and open forest. This positive harvest performance indicates that a partition is no longer required. Harvest performance in FMER areas will be evaluated at the next timber supply review to ensure these ecosystems continue to be appropriately managed over the long-term.

I accept that the approach used for modelling fire maintained ecosystems in the base case reasonably reflects current practices and legal requirements and this factor has been appropriately considered.

*- identified wildlife and ungulate winter range*

Wildlife in the Cranbrook TSA have been protected through the establishment of wildlife habitat areas, ungulate winter range, and management practices specified in higher level plans.

An Ungulate Winter Range (UWR) has been established in the TSA for the protection of habitat for white-tailed deer, mule deer, moose, elk, bighorn sheep and mountain goat. The prescribed General Wildlife Measures (GWM) do not exclude timber harvesting in this UWR. Another UWR was established for the protection of woodland caribou range in which harvesting is restricted. This UWR was excluded from harvest in the base case.

There are 81 wildlife habitat areas (WHA) established for the protection of identified wildlife in the TSA. The associated GWMs established by ministerial order under the *Government Actions Regulation* (GAR) guide harvest practices in WHA. Operationally, the prescribed harvest practices vary by identified wildlife species from little operational impact to complete restriction of harvesting.

The majority of the 98 223 hectares covered by WHAs consists of a single WHA for grizzly bear totalling 76 281 hectares. The GWMs for this WHA provide direction on cutblock design and road construction but do not restrict any area from harvesting. Of the remaining WHA area, only 19 733 hectares were excluded from the THLB in base case on account of GWMs that completely restricted harvesting.

A letter from the Southern Guide and Outfitters requested a review of wildlife populations be completed for the TSA in order to ensure that the populations are sustainable. The group also inquired if evaluations are performed following establishment of WHAs to ensure the wildlife populations are benefitted. I am aware that some WHA effectiveness monitoring has been undertaken by the Ministry and a Stand Level Wildlife Value monitoring protocol is under development to be added to the district led FREP. FREP is also developing a WHA/UWR assessment monitoring procedure. District staff inform me that a recent WHA review by Ministry biologists has resulted in the re-opening of best management practices to ensure specific habitat requirements are being maintained.

The Backcountry Hunters and Anglers Association submitted a request to establish and adopt a Wildlife Security Standard across the forest district that identifies all measurable components of secure habitat and cover. I note that the need for improved understanding of wildlife populations to support policy decisions led to the implementation of Habitat Supply Modelling for seven wildlife species of concern in the TSA. The habitat supply assessments attempt to provide the information required to evaluate the success of policy mechanisms such as WHAs and GWMs currently in place. I will consider the information collected so far and the implications to timber supply under the 'Cumulative Effects' section.

Comments received from The Ktunaxa Nation Council state that additional habitat area beyond the current WHAs must be protected in order to maintain wildlife populations. As discussed above, the effectiveness of the area reserved under current policy mechanisms will be discussed under the 'Cumulative Effects' section. The Ktunaxa Nation Council also recommended that all WHAs should have been modelled as fully excluded from harvest in the base case. District staff note that some WHAs overlap FMER areas where a limited amount of harvesting is required for ecosystem restoration. Identified wildlife species such as badger require ecosystem restoration to preserve and enhance habitat.

The Ktunaxa Nation Council inquired if the work completed by the Elk Valley Flathead Wildlife Enhancement Initiative was considered in the analysis. District staff inform me that the initiative is currently stalled. If the process resumes, any findings will be reviewed prior to the next timber supply review. I would also encourage any future wildlife habitat assessments consider the impacts and

potential changes to ecosystems over time due to climate change. Conserving an area that has certain attributes today does not guarantee that the same attributes will be present into the future.

I am satisfied with the approach used to model UWRs and WHAs for identified wildlife in the base case. I will make no further accounting for this factor in my decision.

*- cultural heritage resources areas*

Information on cultural heritage and archaeological sites is provided by an Archaeology Overview Assessment and band specific Traditional Use Studies that have been completed within the Cranbrook TSA. Additional information is collected through consultation with First Nations regarding their aboriginal interests during the Forest Stewardship Plan application processes and through site-specific consultation that occurs during the cutting permit adjudication process. Most known cultural heritage and archaeological sites are small and many are found in areas with additional ecological or environmental protection requirements. These sensitive lands are typically reserved from harvest through the placement of riparian reserves or wildlife tree retention areas. District staff indicate that minimal additional area to that already reserved would be required to protect cultural heritage and archaeological sites. Therefore, no land base reduction was applied for cultural heritage resource areas during the identification of the THLB used in the base case.

District staff are aware that certain areas of the TSA hold significant value to First Nations and will likely result in a higher level of information provided by First Nations during consultation. The areas may reveal more extensive cultural heritage and archaeological sites that would require the establishment of additional reserve area beyond those modelled in the base case.

The accounting for cultural heritage resource areas in the base case is consistent with the previous TSR and current practice has not demonstrated any exceptions. However, district staff and comments received from the public have expressed concern that licensees are deferring harvest in areas that hold significant value to First Nations. The potential for additional reserves to accommodate more extensive cultural heritage and archaeological sites, and their effect on timber supply, will be unknown until harvest planning begins for a given area.

I am also aware that Canfor's forest certification regime has established 'Cultural Conservation Value Forests' which have potential operational limitations. In the comments received from First Nations, a request was made for a sensitivity analysis to investigate the effect on timber supply of restricting harvest in the areas classified by Canfor as 'Cultural Conservation Value Forests'. District staff noted that a sensitivity analysis could not be completed as Canfor has not made the certification regime data publicly available.

I have considered the information regarding cultural heritage and archaeological sites provided to me by district staff and the comments received from the public and First Nations. I recognize that areas that require additional harvest planning operations in cooperation with First Nations may be deferred due to the extra time required and expense. I support the work completed to date between Canfor and Ktunaxa Nation Council in identifying the 'Cultural Conservation Value Forests' and developing management practices for these areas. However, until these areas are managed as reserves by all licensees or are legally protected from harvest, I am unable to make adjustments to my decision on this account. District staff inform me that a cultural heritage resources monitoring initiative is currently planned and any information collected can be accounted for in subsequent AAC determinations.

**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

### *- harvest performance*

The cut control records show that there was a small over harvest by some replaceable forest licence holders between 2012 and 2016. However, this was offset by the under utilization of harvest allocated to non-replaceable forest licences resulting in a total harvest that is 5.5 percent below the AAC.

The near full harvest of the AAC is encouraging on its own but causes me concern when considered in relation to the poor harvest performance on steep slopes discussed earlier. Analysis staff inform me that, if the current harvest was distributed proportionally to the terrain area profile of the TSA, only 48.4 percent of the cut that should have been located on potential steep slope land base has been harvested. This indicates that the remaining 51.6 percent of the steep slope harvest allocation has been shifted to low slope land base. If this pattern continues, there is a potential sustainability issue for mid-term timber supply as harvesting will be limited to predominately steep slope areas.

I expect licensees to ensure that future harvesting better represents the terrain profile of the operable land base within the TSA. As discussed under '**Implementation**', I request that licensees work with district and FAIB to come up with measures that will ensure that progress is made towards achieving this goal and report on progress annually so that I may monitor timber harvest sustainability in the TSA. This supports the strategy to monitor harvesting activities for consistency with management unit plans and assumptions that was created to meet the timber volume flow objective established in the *Provincial Timber Management Goals and Objectives* (2014). If harvest performance on steep slopes does not meet or exceed the level assumed in the base case on which my AAC decision is predicated, I will consider institution of a partition in the AAC attributable to steep slopes, or re-determine the AAC earlier than the ten-year period specified in Section 8 of the *Forest Act*.

### *- forest stewardship council certification*

Canfor obtained FSC Certification in 2005 and has been operating under a Sustainable Forest Management Plan (SFMP) which details the strategies followed to ensure conformance with FSC principles. District staff are not directly involved in the FSC Certification process and Canfor's current FSP does not include the FSC commitments in the results and strategies.

One of the principles of the SFMP is to maintain High Conservation Value Forest (HCVF) areas which have been mapped as part of the FSC certification process. These areas are intended to protect forests with significant biodiversity values and endangered ecosystems, or enhance those values. Forest areas fundamental to meeting the basic needs of local communities and support traditional cultural identity are also mapped as Cultural Conservation Value Forests (CCVF).

The HCVF and CCVF areas designated as excluded from harvest within the SFMP were not modelled as excluded in the base case unless there was overlap with a legal objective or commitment in the FSPs to exclude harvest. Canfor does not make the mapping of HCVF and CCVF areas available to the public but was able to provide a summary of the overlap between these areas and the THLB. The area designated as excluded from harvest within the SFMP that was not excluded from the THLB through other legal objectives was approximately 0.4 percent of the THLB. This minor difference provides me assurance that current management under the SFMP will not likely differ from the base case in terms of area reserved from harvest.

Comments from the public and First Nations suggested that the HCVF and CCVF areas designated as no harvest should have been excluded from contributing to timber supply in the base case. The management practices specified for these areas within the SFMP are not practiced by all licensees or

enforced through any legal mechanism and, without that certainty, I am not able to account for them as current practice in my decision.

As indicated in my Guiding Principles, I will not speculate on land use decisions that have yet to be made by government. Therefore, while I recognize that Canfor is operating in accordance with the practices it negotiated with FSC and that very little additional area would be reserved from the THLB, I will not account for these practices in this determination. In the event that government establishes legal requirements for HCVF and CCVF following this determination or these areas are recognized as harvest reserves in current management by all licensees, they can be considered in subsequent AAC decisions. On this basis, I accept that the HCVF and CCVF were modelled appropriately and make no further accounting in respect to this factor in my decision.

*- First Nations consultation*

The KNC has signed a Strategic Engagement Agreement (SEA), covering the period from 2013 to 2016, which is presently being renegotiated. A Forest Tenure Opportunity Agreement between the KNC and the Ministry provides licences to harvest to Ktunaxa communities. The KNC has also signed an Economic and Community Development Agreement for revenue sharing with forestry and mining operations within the TSA. Aq'am established the St. Eugene Golf Resort and Casino located on the St Mary's Reserve and the Tobacco Plains Indian Band owns the Big Springs campground and also manages the provincial campgrounds at Dorr Road and Ayes Ranch. The Tobacco Plains Indian Band has a significant interest in the agricultural sector with the specialty of raising Texas longhorn cattle.

The Ktunaxa Kinbasket Treaty Council represents the KNC in treaty negotiations that have been ongoing since 1993. The negotiations are nearing completion of Stage 4 producing an Agreement-in-Principle that is currently under review by Ktunaxa Communities and Ktunaxa Government Sectors. A decision to proceed to Final Agreement negotiations is pending.

The SNTC member bands are not involved in a treaty process but are engaged with the Province in New Relationship and other discussions associated with land and resource use within asserted traditional territories. A Forest Tenure Opportunity Agreement between the SNTC and the Ministry provides Shuswap communities with licences to harvest within the TSA.

First Nations consultation was undertaken as per the Haida consultation spectrum and consistent with the consultation requirements specified in Forest Consultation and Revenue Sharing Agreements, SEAs, and 2010 Updated Consultation Procedures.

In April 2014, an initial letter was sent by the Regional First Nations Relations (RFNR) team out to all First Nations with territory overlapping the TSA advising them that a new TSR was going to be initiated and that this process would culminate with the chief forester determining a new AAC for the Cranbrook TSA. The KNC response letter stated their interest in being involved in a meaningful way in the TSR process. There was no response from the Shuswap Indian Band to this letter or any of the other following correspondence discussed below.

Following this letter, on October 26, 2015, the Cranbrook Data Package was sent for review by the same First Nations recipients. A presentation to facilitate the understanding of the Data Package content was made by district staff to the KNC, Ktunaxa members and various representatives on December 16, 2015; January 11, 2016 and January 20th, 2016. A letter providing comments was received from the KNC on January 30, 2016. District staff provided a reply to these comments in a letter sent on March 1, 2016.

On September 8, 2016, the Cranbrook Public Discussion Paper was sent to the recipient First Nations for review. A meeting was held on October 31, 2016 between the KNC, district staff and RFNR staff

to discuss the Public Discussion Paper and the comments received from the KNC along with any other general concerns.

I had the opportunity to hear the concerns and recommendations provided by the KNC in person at a meeting on November 22, 2016. In making this AAC determination, I have considered both this direct communication, as well as the written submissions provided by the KNC.

I was pleased with the willingness of the KNC to engage with the Ministry and the very comprehensive information that was provided. I am very appreciative of the time it takes to assemble considering the limited staffing resources and the number of TSAs that fall within the KNC territory. The relationship between First Nations and government is evolving very quickly and the KNC have expressed an interest in moving towards a relationship of shared decision making. The KNC expressed to me the desire to be involved at the right level of planning to provide meaningful input and ensure that decisions are made with consideration of the issues they see as most important.

I agree that First Nations have much to contribute and there is a lot that we can learn from each other. I encourage First Nations to be engaged as early as possible in the TSR process in order to participate in the collection of information, defining assumptions used and review of the subsequent analysis. Participation in early stages also offers more opportunity for Ministry staff to learn how to more effectively work with First Nations in a collaborative way and enable relationship building in the processes of timber supply reviews.

I have considered the information received from First Nations and, where appropriate, I have addressed these concerns in my decision. I note that there were concerns identified which are not within my authority under Section 8 of the *Forest Act*, and other concerns identified that are being or can be addressed operationally. I am unable to speculate on decisions not yet made by other decision makers, such as land-use decisions. I have, however, wherever possible, worked to bring concerns to the attention of other government authorities so that progress can be made to resolve issues that may be impacting operations and relationships in the Cranbrook TSA.

I have reviewed the information regarding the consultation undertaken with First Nations and considered it along with the expertise provided by district, regional and branch staff. I am satisfied that the consultation was conducted appropriately and that reasonable efforts were made by district staff to engage and inform First Nations in the timber supply review process, collect information regarding their interests and understand how these may be affected by the AAC determination.

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

- *climate change*

Climate change is predicted to impact forest ecosystems in a number of ways, including general increases in temperature, changes in precipitation patterns and increased frequency and severity of disturbances.

The report, *Adapting Forest Management to Climate Change in the Kootenay Boundary Region* (Pacific Climate Impact Consortium 2016) shows projected changes based on a standard set of Global Climate Models to the 2080's in average temperature, precipitation and derived climate variables. The report notes that climate change modelling suggests a potential decline in timber supply over the long term due to increased natural disturbance and lower precipitation in the growing season.

There is uncertainty about both the impact of climate change on timber supply and the appropriate response in timber supply decisions at this time. FAIB staff are planning to undertake analysis of the

potential impacts of climate change on timber supply, and of the implications of different responses. This analysis will support discussions needed to determine the appropriate balance of general approaches in different areas of the province.

The effects of climate change on timber supply was a large concern among the comments received from the public and First Nations. The comments expressed the expectation that climate shifts will have a disproportionate impact in the TSA compared to other parts of the province. The comments also requested that the effects of climate change be incorporated into the timber supply analysis.

I have considered the work done to predict changes in climate across the TSA. Projected climate changes are likely to affect forest productivity, growth, natural disturbances, forest pests and hydrological balances; however, the magnitude and extent of the impacts are not yet certain. I am aware that to the extent some of these impacts are already observed, such as through recent disturbances from wildfires or increased damage from pests, they are reflected in timber supply analysis. I request that Ministry staff continue to monitor changes and where possible, collect information to inform decisions. Any additional information and corresponding analysis that helps us to better understand how forest management decisions can be adapted to mitigate impacts can be incorporated into future timber supply reviews.

I have provided a more detailed description of how I account for climate change in AAC decisions under the **‘Guiding Principles’** section of this rationale.

*- cumulative effects*

In its 2007 decision on *William*, the BC Supreme Court ruled that decision makers should consider credible information on wildlife values associated with First Nations rights and needs (e.g., hunting, trapping, fishing and trading), and the potential implications of the decision on wildlife and First Nations’ needs. The Government of BC has supported implementation of the Cumulative Effects Framework (CEF) that aims to provide relevant information and supporting policy for decision making needs. The TSR process leveraged the CEF wildlife value assessments to support this requirement.

Habitat Supply Modelling (HSM) is to be completed for seven species in the Arrow, Kootenay Lake, Cranbrook and Invermere TSAs in relation to the base cases established through recent TSRs. The species selected were determined through consultations with the Ktunaxa Nation Council and included Flammulated Owl, Northern Goshawk, Williamson’s Sapsucker, Rocky Mountain elk, mule deer, grizzly bear and American marten. At this time, the modelling results for a sub-set of three species were completed for my consideration in my AAC decision. These species were selected because forestry activity may have a particularly strong negative effect on their habitat. Specifically, northern goshawk and American marten depend on old forest and are therefore sensitive to conversion of old to early seral forest. Grizzly bear are negatively impacted by human use of roads and trails and are therefore sensitive to forestry road development.

The current condition, trend from 2003, and potential future effects on Northern Goshawk, American marten, and grizzly bear habitat were assessed. The reference points for interpreting value conditions were based on government expectations found in guidance, best management practices or policy. Information presented included both direct (e.g., amount of timber harvest) and indirect (e.g., spatial pattern of harvest) effects that may result from harvesting at the base case level, recognising that the model spatialization is only an interpretation of what the actual harvest patterns might look like.

The most significant factor threatening northern goshawk populations in British Columbia is the loss of mature and old forests used by goshawks for breeding and foraging. Northern goshawks exhibit strong fidelity to established breeding areas and will occupy them for years if suitable conditions

persist. Direct disturbance from industrial activities close to an active goshawk nest can cause breeding birds to abandon their nests during critical times.

The interior subspecies of the Northern Goshawk was removed from the Identified Wildlife list and does not have formal protection measures beyond best management practices that were established in 2012. The HSM revealed that current harvest practices, as represented in the base case, will reduce the future amount of productive breeding habitat by approximately 66 percent by the year 2095 if no additional actions for Goshawk are employed. The modelling results have a degree of uncertainty due to the limitations of the model which did not incorporate spatial habitat requirements. The summary presented to me concluded that the practices currently employed may be leading to a decline in productive breeding areas for Northern Goshawk which raises concerns for the viability of the population within the TSA. Marten are highly selective of habitats that provide thermal and security cover and are associated with late seral-stage forests and with uneven-aged stands of conifers or mixed woodlands. Marten population sizes have been found to decline with removal of forested habitat, increased human access, and unrestricted trapping. Winter is considered to be the critical season for marten, because feeding opportunities are the most limited, mobility is restricted by deep snow, and energy demands for thermoregulation and travel are the highest.

The HSM revealed that current harvest practices, as represented in the base case, will reduce productive winter habitat for marten by approximately 70 percent. The modelling results also have a degree of uncertainty due to the model not incorporating spatial habitat requirements. The summary presented to me suggests that marten populations may have declined already in portions of the TSA due to historic disturbances. The analysis summary concludes that the amount of old and mature forests retained may not be sufficient and measures should be taken to manage marten habitat in the near future, otherwise populations may continue to decline.

Two models were created to predict the impacts of forestry activity on grizzly bear. The first model was a habitat model that examined changes in habitat quality and quantity due to predicted forestry activity. The second model was a population model that expanded on the habitat model to include impacts of forestry road development and hunting pressure on grizzly bear population abundance, recruitment and mortality rates as well as grizzly bear habitat carrying capacity.

Given that foraging represents one of the most limiting aspect of grizzly bear life history, grizzly bear habitat value is determined by the ability of habitat to provide forage during each growing season. The results of the habitat model showed forestry activity had very little effect on grizzly bear habitat due to their reliance on other habitats such as avalanche paths, riparian areas and alpine.

It is widely accepted by the scientific community that impacts from access and human settlement are the largest factors affecting grizzly bear survival. The population model was first run with no projection of future harvesting. In this scenario, the model predicted that the current forestry-related impacts to grizzly bear habitat could cause a mid-term decline in habitat carrying capacity in combination with increasing mortality rates resulting from the accumulated road density. The second scenario modelled continued timber harvesting as projected in the base case. The population model predicted that continued forestry activity could potentially cause a decline in grizzly bear populations by 15 to 80 percent, which represents a wide range of uncertainty.

I have considered the information presented regarding the CEF assessment work completed in the Cranbrook TSA along with the expertise provided by Ministry staff. I commend the work undertaken to date to better understand the cumulative effects of all activities as well as natural events on the land base and support continued work at the regional level.

I note that there are very similar trends between the HSM results for northern goshawk and marten since both species are heavily dependent on old growth attributes. Regional staff inform me that new

inventory data collected using LIDAR have the potential to better identify suitable breeding and home range habitats for the Northern Goshawk and will assist planning for long term protection. Similarly, the LIDAR inventory data have potential to refine marten habitat mapping, identify fragmentation and improve connectivity planning. I encourage the further investigation of this new data to refine and reduce the uncertainty in the HSM and recommend that new results be incorporated with the timber supply analysis for the next AAC determination.

Regional staff also recommend that the management of Northern Goshawk and marten habitat should both be incorporated into the Integrated Silviculture Strategy (ISS) project being initiated in the region. I agree that the vulnerability of these species, as demonstrated by the HSM, makes them an appropriate value to include in the forward-looking ISS analysis work.

Regional staff inform me that grizzly bear populations in southeast BC have the highest human caused mortality rates in the Province and there is a clear need to conduct and implement access management planning to mitigate these impacts. District staff note that removing roads once forestry activities are completed represents the most effective method of reducing access, compared to the installation of physical barriers that can be removed or circumvented or legislated road closures that require increased enforcement and public awareness. I expect, given the information obtained for this AAC rationale, that licensees will consider utilizing existing road systems as much as possible rather than adding to existing road densities and prioritize the planning of road deactivation. This should be completed using the improved road data collected through my previous instruction. I expect district staff to work with regional staff and licensees to initiate access management planning in the TSA in support of both operations, decrease of road density and grizzly bear requirements in the TSA.

I am aware that the resource values assessed are of particular importance to First Nations. As such, I have included a request under '**Implementation**' that Ministry staff and licensees continue to work with First Nations on planned actions for wildlife habitat management and mitigate the effects of harvesting on habitat values.

**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*

The base case projects a harvest level of 824 700 cubic metres per year that is sustained for the entire forecast. A range of alternative harvest forecasts were developed that varied the harvest rate over time with different initial harvest levels and correspondingly different mid-term levels.

The first alternative harvest forecast begins with the highest possible initial harvest level. The forecast maintains a harvest of 898 210 cubic metres per year for ten years then decreases to a mid-term harvest level of 807 183 cubic metres per year which is 2.1 percent lower than the base case. By the year 2074, the harvest level was forecast to return to the base case level for the remainder of the long-term.

The second alternative harvest forecast begins with the same highest possible initial harvest level of 898 210 cubic metres but only maintains that level for five years. The corresponding mid-term harvest level was slightly higher at 815 810 cubic metres per year which is a 1.1 percent decrease from the base case. As observed in the first alternative harvest forecast, the long-term harvest level could resume the base case level by 2074.

Having considered the information regarding the assumptions around harvest sequencing and the expertise provided by analysis staff, I note that the alternative harvest forecast demonstrate that neither the mid-term timber supply nor the long-term benefitted from an initial accelerated harvest level. I will discuss this further under '**Reasons for Decision**'.

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

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

**Section 8 (8) (d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia:**

Economic and social objectives

*- Minister's letters*

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

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

The Minister also emphasizes the mountain pine beetle outbreak in the interior of British Columbia. He indicates that of particular relevance to AAC 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. As well, the Minister requested that the chief forester consider the local social and economic objectives expressed by the public, and information received from First Nations.

The minister, in another letter dated October 27, 2010 provided the Crown's objectives with respect to mid-term timber supply in areas affected by the mountain pine beetle.

I note that in the base case as well as in the alternative harvest projections prepared for this determination that a primary objective has been to attain a stable, long-term harvest level where the growing stock is also stable. I am satisfied that the base case has incorporated the best available information regarding the impacts of the mountain pine beetle epidemic on stands in the Cranbrook TSA. As discussed elsewhere in this document, the mountain pine beetle epidemic has subsided, and much of the salvage of damaged pine stands has been completed.

During my consideration of the factors required under Section 8 of the *Forest Act*, I have been mindful of the local objectives as well as the interests and objectives of First Nations. I have also reviewed the public consultation process undertaken by the district and considered the input received in making my determination. On this basis, I am satisfied that this determination accords with the objectives of province as expressed by the minister.

*- local objectives*

The Minister's letter of July 4, 2006, suggests that the chief forester should consider important social and economic objectives expressed by the public during the timber supply review process, where these objectives are consistent with the government's broader objectives as well as any relevant information received from First Nations.

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

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

Abnormal infestations

*- mountain pine beetle*

The MPB infestation peaked between 2004 and 2008 in the Cranbrook TSA and has been progressively subsiding since then. Over this time, local licensees actively managed the MPB infestations through aggressive salvage practices and by implementing other suppression activities mainly fall and burn. District staff note that the MPB infestation has basically run its course within the TSA. As such, no additional analysis of the MPB infestation was included in the base case and any remaining losses at the endemic level of infestation were accounted for in the natural stand yield projections.

District staff concur that no further consideration of the recent MPB infestation was required but note that future periodic losses should have been considered in the base case. Periodic losses due to other beetle species and natural disturbances that remain unsalvaged were accounted for in the base case through non-recoverable loss reductions to the growing stock each year of the forecast.

The volume that will be periodically killed by MPB and never salvaged was estimated by district staff using information gathered from overview flight surveys completed by forest health professionals within the Resource Practices Branch and historic information observed at the district level. The losses recorded over the last ten years averaged to be approximately 46 600 cubic metres annually.

I agree that not accounting for future outbreaks of MPB in the base case was an oversight. However, I believe the estimate of 46 600 cubic metres per year, approximately 5.7 percent of the base case, to be too high. The data were collected during a catastrophic outbreak of MPB over the last ten years and represent an upper limit to potential losses. I am mindful that the estimated losses used in the analyses supporting the last two AAC determinations, prior to the peak of the MPB outbreak, were only slightly lower at 43 561 cubic metres per year and 40 490 cubic metres per year. Outbreaks of this severity may occur again in the future but are highly unlikely in the near term as the age class structure left after the current outbreak is now dominated by younger stands that are not as susceptible to MPB infestation. I am also aware that our warming climate could lead to future insect outbreaks.

Therefore, for this determination I will consider future losses of about 35 500 cubic metres per year which, relative to the base case, is approximately 4.3 percent. I will consider this overestimation of timber supply resulting from not accounting for future losses due to MPB in my determination as discussed in '**Reasons for Decision**'.

*- non-recoverable losses*

Estimated average annual unsalvaged volume losses in stands due to catastrophic events such as wildfires, flooding, wind damage and snowpress were incorporated into the base case. To account for

these factors, a total of 28 475 cubic metres per year was assumed lost and deducted from the harvest forecast.

The largest loss was attributed to windthrow and snowpress which was estimated at 25 228 cubic metres per year. This value was originally estimated during the timber supply review in 2000 to represent windthrow and snowpress issues currently observed in the Flathead Valley. The estimated loss was modelled in the following timber supply review in 2005 and the current analysis supporting this determination. However, district staff have since reconsidered the issue and believe these losses are no longer likely to occur. It is also the opinion of district staff that windthrow and snowpress do not account for any significant level of loss throughout the remainder of the TSA and that no reduction should be modelled on account of this issue.

District staff also reconsidered the loss attributed to wildfires following the completion of the current timber supply analysis. A study was completed that evaluated the operable land base area that has been lost to wildfires over the past ten years and has no record of salvage harvesting. The average operable area lost was 43.7 hectares per year which was estimated to represent a loss of 4850 cubic metres per year. This loss is considered to be in addition to the loss attributed to wildfire modelled in the base case.

Having considered the new information from district staff, I accept that the loss attributed to windthrow and snowpress was overestimated by 25 228 cubic metres per year while the loss attributed to wildfire was underestimated by 4850 cubic metres per year. Together these total 20 378 cubic metres per year which is approximately 2.5 percent of the base case. I conclude that the base case timber supply was underestimated by 2.5 percent and I will consider this in my determination as discussed in '**Reasons for Decision**'.

## **Reasons for Decision**

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

The base case suggests that a harvest level of 824 700 cubic metres per year could be sustained for the entire forecast. I am satisfied that the assumptions applied in the base case forecast for the majority of the factors applicable to the Cranbrook TSA were appropriate. However, I have identified a number of factors which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Some of these factors can be readily quantified and their impact on the harvest level assessed with reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision, but cannot be reliably quantified at this time. Following is my consideration of those factors for which I consider it necessary to further account for their implications to the timber supply.

I have identified the following factors in my considerations as indicating that the timber supply projected in the base case may have been overestimated:

- *Land not administered by the Crown* – areas of private managed forest land were incorrectly included in the THLB resulting in about a 0.4 percent overestimation in the base case harvest level;
- *Problem Forest Types* – considering the absence of harvest performance, these stands should have been fully excluded from harvesting, resulting in about a 7.0 percent overestimation in the base case harvest level;

- *Regeneration Delay* – the regeneration difficulties experienced in portions of the fire maintained ecosystem restoration areas was not accounted for in the base case resulting in about a 1.6 percent overestimation in timber supply;
- *Mountain Pine Beetle* – the unsalvaged losses attributed to mountain pine beetle were not accounted for in the base case resulting in about a 4.3 percent overestimation in timber supply;

Factors identified as indicative of a potential underestimation in the timber supply to a degree that can be quantified with accuracy are as follows:

- *Log grade change* – the yield projections did not account for the dead volume that is now charged to cut control resulting in about a 8.8 percent underestimated in the base case harvest level.
- *Non-recoverable losses* – the unsalvaged losses attributed to windthrow and snowpress were no longer applicable and the unsalvaged losses attributed to wildfires were underestimated which resulted in a combined underestimate of about 2.5 percent in the base case harvest level;

In addition, I concluded that the following factors were indicative of a potential influence on timber supply to a degree that currently cannot be quantified with accuracy:

- *Riparian* – the area excluded from harvesting for riparian values was underestimated by a very small unquantified amount for which I will make no accounting in my decision.

In addition to the adjustments to the base case listed above, and as discussed throughout this document, I have also considered the information and recommendations that I received from First Nations and the public through written submissions and meetings. Many of these considerations are described earlier in this document and have not been repeated in this section.

I have considered the ongoing identification of areas of cultural importance to First Nations and the timber supply risks associated with these areas in this decision. As more information about the location and extent of culturally sensitive sites is made known and government provides land use objectives for these areas, I will be able to account for these areas more explicitly in AAC determinations.

Although I commend the harvest performance demonstrated by the licensees in effectively targeting MPB killed stands over the past ten years, I also recognize that this harvest strategy has restricted harvest to certain stand types and portions of the TSA. This has resulted in a disproportionate accumulation of harvest on flatter terrain areas where the MPB infested stand types generally occur. The sensitivity analyses presented to me, as discussed under ‘**steep slopes**’, clearly show that the base case harvest level can only be achieved if future harvesting resumes a distribution that matches the terrain profile of the THLB.

The base case, without the above considerations, identifies a sustainable harvest level that is 8.6 percent lower than the current AAC. In reviewing the implications for the timber supply resulting from the above factors taken in combination, I note that the timber supply is even lower than suggested in the base case. On balance, the under- and over-estimations attributable to the above factors indicate to me that the base case overestimates timber supply by about two percent.

The harvest sequencing sensitivity analyses demonstrated that neither the mid-term timber supply nor the long-term benefited from an initial accelerated harvest level. Therefore, I see no justification to delay a reduction in the AAC.

## Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the Cranbrook TSA by establishing an AAC of 808 000 cubic metres effective August 24, 2017. The new AAC is a 10.6 percent decrease from the current AAC. This AAC will remain effect until a new AAC is determined, which is required to take place within 10 years of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the 10 years required by legislation. Further, if harvest performance does not meet or exceed the level assumed in the base case on which my AAC decision is predicated, I will consider institution of a partition in the AAC to protect the sustainability of my decision.

## Implementation

In the period following this decision and leading to the subsequent determination, I encourage Ministry staff, licensees and other major project proponents to undertake or support the tasks and studies noted below, the particular benefits of which are described in appropriate sections of this rationale document. I recognize that the ability of all parties to undertake or support these projects is dependent on provincial priorities and available resources, including funding. However, these projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Cranbrook TSA.

1. **Non-merchantable forest types:** I expect improved inventory information be collected for balsam IU stands for use in the next timber supply analysis and that licensees make all efforts to harvest and rehabilitate these stands in order to ensure a sustainable future AAC;

I expect licensees to remain vigilant in identifying stands where white bark pine grows and make every effort to minimize the incidental harvest of this species;

2. **Roads, Trails and Landings:** I expect improved road inventory data be collected for use in the next timber supply analysis;
3. **Volume estimates for managed stands:** I expect district staff to work with FAIB and Resource Practices Branch staff to implement a monitoring program that includes YSM and SDM;
4. **Decay, waste and breakage:** I expect licensees to fully utilize the volume harvested and consider ways in which waste could be used in fibre based products;
5. **Grade 4:** I instruct staff to monitor the volumes attributed to the grade 4 cut control credit and if such volume becomes a sustainability concern for the timber supply, request a maximum volume limit be implemented by the Minister;
6. **Steep slopes:** I expect licensees to work with district and FAIB analysis staff to develop measures that will ensure progress is made towards achieving a harvest distribution that better represents the terrain profile of the operable land base. It is my expectation that district staff will report harvest performance on steep slopes to me annually.

7. **Landscape level biodiversity:** I expect licensees to work in collaboration with the district to track OGMA's and uphold their designations;
8. **Fire maintained ecosystem restoration:** I recommend that the KNC work with licensees during the upcoming FSP renewal process to ensure the commitments, based on the Ministry's new best practices, address their concerns for management of fire-maintained ecosystems and the wildlife habitat values they provide;
9. **Cummulative effects:** I encourage region staff to further investigate the use of LIDAR data to refine and reduce the uncertainty in the habitat supply modelling and recommend that new results be incorporated with the timber supply analysis for the next AAC determination.

I expect that licensees to consider utilizing existing road systems as much as possible and prioritize the planning of road deactivation. I expect district staff to work with region staff and licensees to initiate access management planning in the TSA in support of both operations, decrease of road density and grizzly bear requirements in the TSA.

I request that Ministry staff and licensees continue to work with First Nations on planned actions for wildlife habitat management and mitigate the effects of harvesting on habitat values.



Diane Nicholls, RPF  
Chief Forester

August 24, 2017

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

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

### **Purposes and functions of ministry**

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

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

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

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

(d) encourage a vigorous, efficient and world competitive

(i) timber processing industry, and

(ii) ranching sector

in British Columbia;

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

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



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.

Page 1 of 2

Minister of  
Forests and Range  
and Minister Responsible  
for Housing

Office of the  
Minister

Mailing Address:  
PO Box 9049 Stn Prov Govt  
Victoria BC V8W 9E2  
Telephone: 250 387-6240  
Facsimile: 250 387-1040

Location:  
Parliament Buildings  
Victoria BC V8V 1X4  
e-mail: FOR.Minister@gov.bc.ca



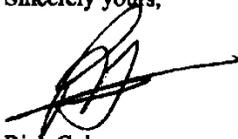
**Jim Snetsinger**

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.

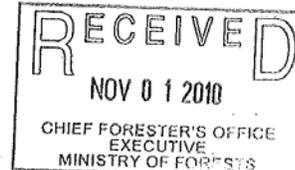
You should also consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

Sincerely yours,

A handwritten signature in black ink, appearing to read '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

Page 1 of 2

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

Mailing Address:  
P.O. BOX 9049 Stn Prov Govt  
Victoria, BC V8W 1X4

Tel: (250) 387-6240  
Fax: (250) 387-1040  
Website:  
[gov.bc.ca/forlimbwww.gov.bc.ca](http://gov.bc.ca/forlimbwww.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