

**BRITISH COLUMBIA**

**MINISTRY OF FORESTS, LANDS  
NATURAL RESOURCE OPERATIONS  
AND RURAL DEVELOPMENT**

**Lakes  
Timber Supply Area**

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

**November 21, 2019**

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## Table of Contents

Objective of this document.....	3
Acknowledgement.....	3
Statutory framework.....	3
Description of the TSA.....	3
History of the AAC .....	3
New AAC determination.....	4
Role and limitations of the technical information used.....	4
Guiding principles for AAC determinations .....	4
The role of the base case .....	7
Base case for the Lakes TSA.....	8
Consideration of factors as required by Section 8(8) of the <i>Forest Act</i> .....	9
Land base contributing to the timber harvest.....	11
- general comments .....	11
- non-provincial land.....	11
- area-based tenures.....	12
- estimates for roads, trails and landings .....	12
- old growth management areas .....	12
- economic and physical operability .....	13
- problem forest types .....	14
- riparian management .....	14
- minimum harvest age and volume .....	15
- deciduous component of coniferous-leading stands .....	17
Utilization .....	17
- interior log grade change .....	17
- grade 4 volume and credit.....	18
Integrated resource management .....	18
- landscape level biodiversity – seral stage distribution.....	18
- wildlife habitat areas.....	19
visual quality objectives.....	20
Other information .....	20
- hydrological considerations .....	20
- cumulative effects.....	21
- carbon sequestration .....	21
- climate change .....	22

- harvest performance.....	24
- unused AAC disposition .....	24
- partition options and implications.....	24
Economic and social objectives .....	26
- Minister’s letter.....	26
- First Nations consultation .....	27
- summary of public engagement.....	30
Abnormal infestations, devastations, and salvage programs .....	31
- dead volume from fire-impacted stands.....	31
Reasons for Decision.....	32
Determination .....	33
Implementation.....	34
Appendix 1: Section 8 of the <i>Forest Act</i> .....	35
Appendix 2: Section 4 of the <i>Ministry of Forests and Range Act</i> .....	38
Appendix 3: Minister’s letter of October 30, 2017.....	39
Appendix 4: Information sources used in the AAC determination .....	42

**List of Tables**

Table 1. List of factors accepted as modelled in the base case .....	9
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## **Objective of this document**

This document provides an accounting of the factors I have considered and the rationale I have employed as chief forester of British Columbia (BC) in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Lakes 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 (the “Ministry”) in the Nadina Natural Resource District (NNRD), the Skeena Natural Resource Region, the Omineca Natural Resource Region, and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to the First Nations, local residents, individuals and companies 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 TSA**

The Lakes timber supply area (TSA), located in north-central British Columbia, encompasses approximately 1.5 million hectares of land. The TSA contains the headwaters of important tributaries of both the Skeena and Fraser watersheds as well as numerous lakes, which include some of the largest natural freshwater bodies in British Columbia.

The gently rolling terrain of the TSA is typical of the Nechako plateau portion of the central interior of British Columbia. The climate is characterized by seasonal extremes of temperature, including severe and snowy winters, and relatively short and warm summers. The ecosystems support forests dominated by lodgepole pine, hybrid spruce and subalpine fir (balsam).

The Village of Burns Lake, with a population of about 2,000, is the largest community within the Lakes TSA. The remainder of the TSA’s population – about 6,000 residents – is located in numerous smaller communities including Decker Lake, Grassy Plains, and Danskin. The culture of the communities is heavily rooted in outdoor recreation and the forest industry.

There are six First Nation communities and a central economic development office (Burns Lake Native Development Corporation) that represents the broad collective economic interests of the six Nations within the Lakes TSA. These six Nations are: Cheslatta Carrier Nation, Lake Babine Nation, Ts’il Kaz Koh First Nation (formerly Burns Lake Band), Wet’suwet’en First Nation, Skin Tyee Nation, and Nee Tahi Buhn Band.

An additional six First Nations maintain communities outside the TSA; however, they assert rights and title that overlap the Lakes TSA. These are: Stellat’en First Nation, Nadleh Whut’en First Nation, Tlazt’en Nation, Ulkatcho First Nation, Takla Lake First Nation, and Yekooche First Nation. The Office of the Wet’suwet’en, which represents Wet’suwet’en Hereditary Chiefs, also asserts rights and titles within the Lakes TSA.

The local economy is largely resource based and mostly dependent on the regional forest industry. There are three lumber mills and one pellet plant currently in operation within the Lakes TSA. These mills all rely on timber harvested from the Lakes TSA and from neighbouring TSAs. In addition, there is a lumber mill and a bio-energy plant in Fraser Lake that receive a significant portion of their volume from the Lakes TSA.

## **History of the AAC**

In 1982, the AAC for the Lakes TSA was set at 1.5 million cubic metres. This AAC remained unchanged until 2001 when the AAC was increased to 2 962 000 in response to the mountain pine beetle (MPB)

epidemic. In October 2004, the AAC was further increased to 3 162 000 to target pine stands moderately and severely impacted by the mountain pine beetle.

On July 12, 2011, the AAC for the Lakes TSA was set 2.0 million cubic metres, including a partition of 350 000 cubic metres attributable to non-pine species.

In September 2016, following the expansion of the Burns Lake Community Forest, and the creation of the Chinook Community Forest, the Lake Babine Nation Woodland Licence and the Nee Tahi Buhn Band First Nations Woodland Licence, the AAC was adjusted to 1 648 660 cubic metres. This adjustment, done through the Allowable Annual Cut Regulation under the *Forest Act*, includes a partition of 288 516 cubic metres attributable to non-pine species.

## **New AAC determination**

Effective November 21, 2019, the new AAC for the Lakes TSA is 970 000 cubic metres. This AAC includes the following partitions:

- *Live coniferous volume*: A maximum of 400 000 cubic metres per year is attributable to live conifer volume;
- *Live deciduous volume*: A maximum of 20 000 cubic metres is attributable to live deciduous volume;
- *Dead volume*: A maximum of 550 000 cubic metres is attributable to dead volume.

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

## **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 related to inventory, growth and yield and management. The factors used as inputs to timber supply analysis have differing levels of uncertainty associated with them, due in part to variation in physical, biological and social conditions.

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, I have considered the technical information provided, including any known limitations.

## **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 aware of my obligation as a steward of the forests of British Columbia, of the mandate of the Ministry of Forests, Lands, Natural Resource Operations

and Rural Development (“the Ministry”) as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest Act*, *Forest and Range Practices Act* (FRPA), and *Foresters Act*.

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.

These guiding principles focus on: responding to uncertainties; incorporating information related to First Nations’ rights, titles and interests; and considering information related to integrated decision making, cumulative effects, and climate change.

#### 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 potential current and future social, economic, and environmental risks associated with a range of possible AACs; and,
- (ii) re-determining AACs regularly to ensure they incorporate current information and knowledge, and greater frequency in cases where projections of short-term timber supply are not stable and/or substantial changes in information and management are occurring.

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 consistent with legislative requirements and not substantiated by demonstrated performance.

It is not appropriate to speculate on timber supply impacts that may eventually result from land-use designations not yet finalized by government. Where specific protected areas, conservancies, or similar areas have been designated by legislation or by order in council that prohibit timber harvesting, 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 that helps meet resource management objectives such as biodiversity.

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to fully analyse and immediately account for the consequent timber supply impacts in an AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, further detailed planning or legislated designations such as those provided for under the *Land Act* and FRPA. In cases where government has been clear about the manner in which it intends land use decisions to be implemented, but the implementation details have yet to be 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 on-going plan implementation decisions.

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

I acknowledge the perspective that alternate strategies for dealing with information uncertainty may be 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 precautionary response to uncertainty with respect to a single value.

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

### First Nations

The BC government has committed to true, lasting reconciliation with Indigenous Peoples, including fully adopting and implementing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Reconciliation and implementation of UNDRIP will likely require changes to policies, programs and legislation, which will take time and involve engagement with Indigenous Peoples. While this work is undertaken, BC is committed to fulfilling its legal obligations to consult and accommodate potential impacts to asserted Aboriginal rights, title and other interests (“Aboriginal Interests”) and treaty rights consistent with the Constitution, case law, and relevant agreements between First Nations and the government of BC.

Where First Nations and the Province are engaged in collaborative land and resource planning, the Province may make general commitments regarding stewardship and other aspects of resource management. Where such commitments have been made, I will consider them when determining AACs, within the scope of my statutory authority.

As is the case for land use and management planning in general, where land use zones or management objectives resulting from collaborative planning between First Nations and the Province have not been finalized, it is beyond the statutory authority of the chief forester to speculate on final outcomes. If the timber supply implications of final designations are substantial, application of the Allowable Annual Cut Administration Regulation to reduce a management unit AAC between Section 8 determinations, or a new AAC determination prior to the legislated deadline may be warranted.

Where the nature, scope and geographic extent of Aboriginal rights and title have not been established, the Crown has a constitutional obligation to consult with First Nations regarding their Aboriginal Interests in a manner proportional to the strength of their Aboriginal Interests and the degree to which they may be affected by the decision. The Crown also has a constitutional obligation to consult with First Nations regarding their treaty rights. The manner of consultation must also be consistent with commitments made in any agreements between First Nations and the Province. In this regard, full consideration will be given to:

- (i) the information provided to First Nations to explain the timber supply review process and analysis results;
- (ii) any information brought forward through consultation or engagement processes or generated during collaboration with First Nations with respect to treaty rights or Aboriginal Interests, including how these rights or interests may be impacted;
- (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; and,
- (iv) existing relevant agreements and policies between First Nations and the BC Government.

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 treaty rights or Aboriginal Interests that could have implications for the AAC determination are addressed in the various sections of this rationale where it is within the statutory scope of the determination.

Established Aboriginal title lands (meaning declared by a court or defined under an agreement) 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. Prior to establishment of Aboriginal title, it is not appropriate for the chief forester to speculate on how potential establishment of Aboriginal title in an area, either by court declaration or by agreement, could affect timber supply, given uncertainties about the scope, nature and geographic extent of

title. Until land has been established as Aboriginal title land, it remains as provincial land managed by the Province, and will contribute to timber supply.

#### Integrated decision making and cumulative effects

One of the responsibilities 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 relevant available information on timber and non-timber resources in the management unit, including information on the interactions among those resources and the implication for timber supply.

With respect to cumulative effects, I must interpret related information according to my statutory authority. As emphasized above, the chief forester is authorized only to make decisions on allowable harvest levels, not to change or institute new management regimes for which other statutory decision makers have specific authority. However, cumulative effects information can highlight important issues and uncertainties in need of resolution through land use planning, which I can note and pass to those responsible for such planning. Information on cumulative effects can also support considerations related to Aboriginal Interests and treaty rights.

#### Climate change

One key area of uncertainty relates to climate change. There is substantial scientific agreement that climate is changing and that the changes will affect forest ecosystems. Forest management practices will need to be adapted to the changes, and can contribute to climate change mitigation by promoting carbon uptake and storage. Nevertheless, the potential rate and specific characteristics of climate change in different parts of the Province are uncertain. This uncertainty means that it is not possible to confidently predict the specific, quantitative impacts on timber supply.

When determining AACs, I consider available information on climate trends, potential impacts to forest ecosystems and communities that depend on forests and related values, and potential management responses. As research provides more definitive information on climate change and its effects, I will incorporate the new information in future AAC determinations. Where forest practices are implemented to mitigate or adapt to the potential effects of climate change on forest resources, or where monitoring information indicates definite trends in forest growth and other dynamics, I will consider that information in my determinations.

I note, however, that even with better information on climate change, in many cases there will be a range of reasonable management responses. 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, which appear to be likely in some areas. Hypothetically, focused harvests in at-risk forests could forestall losses of timber and allow for planting of stands better adapted to future conditions. Conversely, lower harvest levels could provide buffers against uncertainty. The appropriate mix of timber supply management approaches is ultimately a social decision.

Deciding on the preferred management approach will involve consideration of established climate change strategies, and available adaptation and mitigation options together with social, economic, cultural, and environmental objectives. Analysis will be useful for exploring options and trade-offs. Any management decisions about the appropriate approach and associated practices will be incorporated into future AAC determinations. In general, the requirement for regular AAC reviews will allow for the incorporation of new information on climate change, on its effects on forests and timber supply, and on social decisions about appropriate responses as it emerges.

### **The role of the base case**

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply projections provided to me through the work of the Timber Supply Review Program (TSR) for TSAs and TFLs.

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

From a range of possible harvest projections, 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 it 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 established management 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 the assumptions made in generating the base case are realistic and current, and the degree to which resulting projections 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 analyses I am provided are 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, particularly in cases characterized by a large degree of unquantified uncertainty, 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 Lakes TSA**

The base case was prepared by FAIB staff in 2019 using Remsoft's spatial optimization model, Woodstock. 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 the current conditions in the Lakes TSA as documented in the *Data Package* (April 2019 update).

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 objective used to prepare the base case for this determination was to maintain a sustainable live volume harvest flow while initially capturing dead volume.

In the base case projection, which started from 2019, an initial harvest level of 400 000 cubic metres of live volume was maintained for the first six decades. In addition to the harvest of the live volume, 400 000 cubic metres of dead volume is potentially available for harvest in the first decade. This dead volume is from stands severely impacted by the mountain pine beetle.

Rather than modelling an estimate of the decline in merchantability of dead volume over time, the base case assumed all currently dead volume identified in the forest inventory was merchantable. This provided an upper bound on the potentially available dead volume. The projected amount of dead volume is 400 000 cubic metres per year in the first decade of the forecast and averages about 75 000 cubic metres per year between the second and the sixth decade.

Second-growth stands are forecasted to be harvested starting in year 30 and constitute almost all of the harvest starting in the seventh decade. The base case forecast shows a stable long-term harvest level of 900 000 cubic metres per year is possible.

In the first decade of the base case, stands on poor sites contribute about 292 000 cubic metres per year of live volume and 265 000 cubic metres per year of dead volume.

About half of the forested area within the TSA is immature reflecting the mountain pine beetle epidemic and the history of wildfires in the TSA. The total volume of growing stock on the timber harvesting land base is about 23 million cubic metres. Of that amount, 13 million cubic metres is currently merchantable (greater than the minimum harvestable age). Over the first four decades of the forecast, this merchantable growing stock declines to six million cubic metres as existing mature stands are harvested. The long-term merchantable growing stock, which is based on faster growing plantations, is approximately 40 million cubic metres.

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. I have reviewed in detail the assumptions and methodology incorporated in these analyses and forecasts and in the base case. Based on this review, I am satisfied, subject to the qualifications accounted for in various sections of this document, that the information presented to me provides suitable basis from which I can assess the timber supply for the Lakes TSA.

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

I have reviewed the information for 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 issues raised and the reasoning that led to my conclusions.

*Table 1. List of factors accepted as modelled in the base case*

<b><i>Forest Act</i> section and description</b>	<b>Factors accepted as modelled</b>
8(8)(a)(i) the composition of the forest and its expected rate of growth on the area	<ul style="list-style-type: none"> <li>• Non-forest and non-productive areas</li> <li>• Parks and protected areas</li> <li>• Wildlife habitat reserves – mountain goat</li> <li>• Red- and blue-listed ecological communities and rare and hydro-riparian ecosystems</li> <li>• Low productivity sites</li> <li>• Wildlife tree retention</li> <li>• Forest Inventory</li> <li>• Age class structure and species profile</li> <li>• Volume estimates for natural existing stands</li> <li>• Volume estimates for existing mountain pine beetle mortality</li> <li>• Volume estimates for managed stands</li> <li>• Site productivity estimates</li> </ul>
8(8)(a)(ii) the expected time that it will take the forest to become re-established following denudation	<ul style="list-style-type: none"> <li>• Regeneration assumptions</li> <li>• Genetic gains</li> <li>• Operational adjustment factors</li> </ul>

<b><i>Forest Act</i> section and description</b>	<b>Factors accepted as modelled</b>
8(8)(a)(iii) silviculture treatments to be applied to the area	<ul style="list-style-type: none"> <li>• Silviculture systems</li> <li>• Incremental silviculture program</li> </ul>
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	<ul style="list-style-type: none"> <li>• Decay, waste and breakage and coarse woody debris</li> <li>• Utilization standards</li> </ul>
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	<ul style="list-style-type: none"> <li>• Landscape corridors</li> <li>• Species at risk – grizzly bear</li> <li>• Ungulate species – moose and deer</li> <li>• First Nations – cultural heritage resources</li> <li>• Cutblock adjacency and green-up</li> </ul>
8(8)(a)(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber	
8(8)(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area	<ul style="list-style-type: none"> <li>• Alternative rates of harvest</li> </ul>
8(8)(d) Economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia	<ul style="list-style-type: none"> <li>• Socio-economic information</li> </ul>
Section 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>• Unsalvaged losses</li> </ul>

**Forest Act Section 8 (8)**

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

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

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

Land base contributing to the timber harvest

*- general comments*

The total land area of the Lakes TSA is 1 577 450 hectares. Of this total TSA area, 552 983 hectares (35 percent) is considered Crown managed forest land base (CMFLB) for the purposes of this AAC determination. This CMFLB area is approximately 265 000 hectares smaller than in the previous AAC determination mainly due to the expansion of the Burns Lake Community Forest, and the creation of the Chinook Community Forest, the Lake Babine Nation Woodland Licence and the Nee Tahi Buhn Band First Nations Woodland Licence.

The timber harvesting land base (THLB) is an estimate of the land where timber harvesting is considered both legally available and economically feasible, given the objectives for all relevant forest values, market values and applicable technology. It is a strategic-level estimate developed specifically for the timber supply analysis and, as such, could include some areas that may never be harvested or could exclude some areas that may be harvested.

As part of the process used to define the THLB, a series of deductions was made from the Crown managed forest land base. These deductions account for biophysical, economic or ecological factors that reduce the forested area available for harvesting. For the Lakes TSA, the THLB that is available after deductions are applied is 363 194 hectares. The THLB represents about 23 percent of the total area and about 34 percent of the Crown managed forest land base.

In reviewing these deductions, I am aware that some areas may have more than one classification. To ensure accuracy in defining the THLB, care must be taken to avoid any potential double-counting associated with overlapping objectives. Hence, a specific deduction for a given factor reported in the analysis or the AAC rationale does not necessarily reflect the total area with that classification; some portion of it may have been deducted earlier under another classification.

For this determination, I accept that the approach used to determine the THLB for the Lakes TSA base case was appropriate.

*- non-provincial land*

Certain types of lands are excluded from the Crown managed forest land base for the purpose of an AAC determination. In the Lakes TSA, these include private lands, Indian reserves, federal and municipal parcels and miscellaneous land parcels. These lands account for about 71 000 hectares.

On March 28, 2019, the Province and the Cheslatta Carrier Nation signed a settlement agreement. Under this agreement, Crown lands will be transferred to the Cheslatta Carrier Nation as fee simple (i.e. private) lands. In the base case, these lands were initially included in the Crown managed forest land base. A sensitivity analysis was conducted to examine the impact of excluding these lands showed a 1.6 percent reduction in timber supply in the short term and 2.9 percent in the long term.

I recognize that the scope, nature, and geographic extent of the settlement is known with a reasonable degree of certainty, therefore I have accounted for this commitment in my AAC determination. I conclude that the base case overestimates the short-term timber supply by up to 1.6 percent and the long-term timber supply by up to 2.9 percent. I have accounted for this in my determination, as discussed under '**Reasons for Decision**'.

- *area-based tenures*

The *Forest Act* specifies that the AAC determination for the Crown land in a TSA excludes areas under a community forest agreement (CFA), woodlot licence and First Nations woodland licence (FNWL). The AAC for these area-based tenures is determined using a separate process and does not contribute to the Lakes TSA AAC.

Two FNWLs were mistakenly excluded from the CMFLB, as they are yet to be finalized. These FNWLs are part of Forest Tenure Opportunity Agreements signed in 2015 with the Skin Tyee Nation and Wet'suwet'en First Nation. The total area of these FNWLs is 10 088 hectares (7965 hectares of THLB).

Considering this information and consistent with my '*Guiding principles for AAC determinations*', when the two FNWLs are finalized, I expect the AAC for the TSA to be reduced to account for their removal (under the AAC Administration Regulation), prior to the next AAC determination.

Consequently, I conclude these FNWLs were incorrectly excluded from the THLB. Therefore, I will account for a two percent underestimation of short-term timber supply in my determination, as discussed in '**Reasons for Decision**'.

- *estimates for roads, trails and landings*

Forest roads, logging trails, and landings are considered permanent access structure as they are constructed through soil or rock that is not suitable to the growth of a commercial crop of trees or because they are required for a long enough time that prevents the timely growth of a commercial crop of trees. For these reasons, they are considered non-productive and are removed from the CMFLB.

To estimate the reductions for roads, a buffer was applied to current road data using a geographic information system (GIS). The buffer widths are based on data collected at 1330 random sampling points across the Lakes TSA.

In the base case, a total of 10 698 hectares were removed from the CMFLB to account for existing roads and a total of 4673 hectares were removed from the THLB to account for future permanent access structures.

Input received from Babine Forest Products and Decker Lake Forest Products recommended sensitivity analyses where 25 percent and 50 percent of operational roads are returned to the productive land base. These analyses were not conducted since there is no data to support such activity being undertaken. Forest roads are returned to a productive state when they are decommissioned through a rehabilitation process where all structures (including bridges, culverts, water bars and cross ditches) are removed, the road surface is loosened, the surface is re-contoured, the natural drainage pattern is restored, and trees are planted.

Several important forest stewardship objectives can be achieved by decommissioning forest roads, including: erosion control; fish passage restoration; wildlife habitat enhancement by reducing habitat losses, fragmentation and indirect mortality (i.e., collisions, increased hunting and predation pressure); and carbon sequestration. In many areas of British Columbia, there are increased concerns about the adverse impacts of resource roads density on wildlife. As I will discuss further under '*cumulative effects*', the density of roads in the Lakes TSA is creating a high risk to aquatic ecosystems (fish and wildlife) and grizzly bear survival.

For this reason, I encourage the licensees to decommission in-block roads. I strongly suggest licensees work with the Ministry and First Nations to address fish and wildlife habitats impacted by road densities and consider policy changes to enable road rehabilitation efforts.

For this factor, I conclude that the base case adequately reflected current management practices and accounted for roads, trails and landings.

- *old growth management areas*

Old growth management areas (OGMA) are used to manage for the retention or recruitment of appropriately sized areas of old growth forest. They contain, or could be managed to recruit, specific structural old growth forest attributes and represent the range of ecosystem types found across a planning area.

In the Lakes TSA, OGMAs were established under the Lakes South and Lakes North Sustainable Resource Management Plans (SRMP). They contribute to mature- and old-seral stage targets and a large proportion of OGMAs are co-located with special management areas for other values such as Indigenous Interest areas, caribou, visual quality, and landscape connectivity corridors.

Timber harvesting is not permissible in OGMAs and they are excluded from the THLB. In total, there are 86 864 hectares of OGMAs in the Lakes TSA.

Input received from the Regional District of Bulkley-Nechako indicates a desire for flexibility around forest management practices, which may include harvesting in OGMAs to reduce wildfire risk. Pinnacle Renewable Energy commented OGMAs should be examined to see if some forest management intervention would better support biodiversity objectives. Conversely, one member of the public noted OGMAs overlap with special management areas for other forest values and another public member requested that they should not be changed.

The designation of OGMAs is not within the legislated mandate of the chief forester. However, given the input received for this determination and the ongoing requests for changes to OGMAs in the Lakes TSA, I note that they are a key component of ecosystem health and resiliency and one of the most effective ways of conserving biodiversity and storing carbon. Consequently, any OGMA replacement process must ensure adequate representation of biodiversity values.

I encourage Ministry staff and licensees to conduct a methodical assessment that identifies all areas of old growth within the TSA, including areas currently designated as OGMAs. Potential replacement areas should be thoroughly assessed based on their old growth characteristics and their overall biodiversity value or based on their potential to develop old growth characteristics and structure over time.

Given the degree of overlap between OGMAs and special management areas for other values in the Lakes TSA, opportunities are likely limited. However, there may be some opportunities to improve biodiversity management while minimizing timber supply impacts and improving wildfire resiliency.

I am satisfied that the assumptions used for OGMAs in the base case reflect current management practices and are appropriate.

*- economic and physical operability*

Operability is based on the presence or absence of physical barriers or limitations to harvesting and the merchantability of stands. In the Lakes TSA, the terrain has relatively few physical barriers. However, slopes greater than 40 percent are typically not harvested because they are considered unsafe for conventional ground-based system. This is supported by analyses that show that about 94 percent of stands on slopes steeper than 40 percent have not been harvested. To reflect this practice, slopes steeper than 40 percent were removed from the THLB.

There is a total of 13 471 hectares of CMFLB on slopes greater than 40 percent. After accounting for other overlapping netdowns, a total of 7193 hectares were removed from the THLB in the base case. Based on licensee and public input that claimed that harvesting was occurring on slopes greater than 40 percent and that innovative opportunities existed on steep slopes, a sensitivity analysis including slopes greater than 40 percent was conducted. Including all slopes greater than 40 percent into the THLB results in a 1.3 percent (5000 cubic metres per year) increase in short-term timber supply and a 0.8 percent (7200 cubic metres per year) increase in the long term.

On July 9, 2019, I accompanied representatives from Babine Forest Products and Fraser Lake Sawmills on a field tour where I observed current harvesting on steep slopes. Licensees recommended only slopes greater than 50 percent be considered inoperable, as this is more representative of operational practice.

I agree that forest stands on slopes greater than 40 percent are sometimes harvested and this practice is likely to continue. However, the increase in volume resulting from the portion of the THLB with a slope greater than 40 percent and less than or equal to 50 percent is negligible. Further to this, maps and air photos showing the overlap between steep slopes, other THLB netdowns (such as riparian areas or wildlife tree retention areas), and recent cutblocks indicate that in most instances, the cutblock area overlapped by steep

slopes is very small, dispersed and on the edge of areas retained for other values. As the THLB is a strategic-level estimate developed specifically for the timber supply analysis, it could include some areas that may never be harvested or could exclude some areas, like slopes between 40 and 50 percent, which may be harvested. I will therefore make no adjustment to the base case timber supply to account for slopes between 40 percent and 50 percent. From these considerations, I conclude that the assumptions made in the base case for physical operability reasonably reflect demonstrated forest management practices.

*- problem forest types*

Problem forest types are stands that are physically operable and exceed low site criteria yet are not currently harvested or have marginal merchantability (due to size, quality or volume). In the analysis, three categories of problem forest types were excluded: deciduous-leading stands; coniferous-leading stands in the sub-boreal spruce (SBS) zone older than 140 years and less than 140 cubic metres per hectare; and coniferous-leading stands in the Engelmann spruce-subalpine fir (ESSF) zone older than 250 years with less than 140 cubic metres per hectare.

Regarding deciduous-leading stands, a sensitivity analysis was conducted in response to licensee input suggesting these stands be included in the THLB as deciduous volume is currently being utilized and their utilization is anticipated to increase. This resulted in a five percent increase in short-term timber supply and a four percent increase in long-term timber supply. I am aware that currently, deciduous volume accounts for less than one percent of the total volume harvested. It is unknown how much of that volume is from deciduous-leading stands and how much is from the deciduous component of coniferous-leading stands. I am also aware that deciduous-leading stands are usually found on warm dry slopes within the Lakes TSA and provide high value habitat for moose and deer, spring forage for bears, contribute to broad biodiversity values and contribute to carbon sequestration. Further, cottonwood-leading stands, which are rare in the Lakes TSA, provide important cavity and denning habitat not otherwise available.

After considering the information described above, I recognize that in the past five years, less than one percent of deciduous volumes have been billed in the Lakes TSA. I also recognize deciduous-leading stands make an important contribution to biodiversity and forest carbon. Consequently, I conclude that this factor was adequately modelled in the base case and I will make no adjustment to the base case. If practices change and deciduous harvest increases, this will be incorporated into the next TSR.

*- riparian management*

Riparian areas occur next to the banks or edges of streams, lakes and wetlands. They are rich in biodiversity and provide critical habitats, home ranges and travel corridors for wildlife. Riparian areas are managed according to specifications contained in the Forest Planning and Practices Regulation (FPPR). The FPPR classifies streams based on the width of their channel and the presence or absence of fish. Lakes and wetlands are classified according to their size. The FPPR also specifies minimum widths and management restrictions for riparian reserve zones (RRZ) and riparian management zone (RMZ). Approved Forest Stewardship Plans (FSPs) reflect the FPPR and include commitments regarding the minimum amount of forest retention within RMZs.

Data from the Morice and Lakes Innovative Forest Practices Agreement (IFPA) were used to classify mapped streams into riparian classes. In the base case, riparian retention was modelled as an area netdown based on field sampling conducted under the Forest and Range Evaluation Program (FREP) or, in the absence of FREP data, an average FSP value was applied. Of the 31 821 hectares of CFMLB within riparian buffers, a total of 19 619 hectares were removed from the THLB to account for riparian management.

Input received from Fraser Lake Sawmills suggested the IFPA classification work may overestimate the number of streams classified as 'S4' (fish stream with a channel width less than 1.5 metres). According to fish surveys conducted by the licensee, the base case should have considered a greater proportion of medium size fish streams (i.e., 'S3' or fish stream with a channel width greater than or equal to 1.5 metres and less than five metres), non-fish streams and non-classified drainages than assumed in the analysis.

In response to this input from Fraser Lake Sawmills, a sensitivity analysis was conducted using the stream class distribution suggested by the licensee. This analysis resulted in a 1.3 percent (5000 cubic metres) increase to timber supply in the short term and a 0.9 percent (8100 cubic metres) over the long term. District staff informed me that the stream inventory data provided by Fraser Lake Sawmills is only for their operating areas and does not necessarily reflect the stream class distribution for the TSA.

Babine Forest Products, Decker Lake Forest Products and Fraser Lake Sawmill expressed concerns regarding the application of FREP data to determine the level of retention within RMZs, specifically that the sample size (30 streams) is too small. In response, district staff informed me that FREP data is the only information currently available to determine on-the-ground stream retention practices. They informed me the base case assumptions are based on 29 FREP samples collected within the Lakes TSA between 2005 and 2017.

Licensees also are concerned that by sampling streams bordering cutblock edges, the amount of retention is overestimated. Details provided by district staff indicate that streams often act as a cutblock boundary and that adjacent cutblocks are often separated by a stream. Consequently, the FREP retention width used in the base case is a weighted-average of the retention from both sides of a stream.

In consideration of the information provided and the accounting in the base case for riparian management, I accept that the best information available was used and that riparian management areas were appropriately modelled in the timber supply analysis.

As discussed under '**Implementation**', I expect licensees and district staff to work together to develop a comprehensive stream classification, that examines on-the-ground retention levels for all stream classes, for use in future timber supply reviews.

*- minimum harvest age and volume*

Minimum harvestable criteria are used to define the minimum requirements that existing and future managed stands must reach before they become merchantable and can be harvested. Most stands will not be harvested until well past the minimum criteria mainly due to management objectives for non-timber values that require the maintenance of older forests or because of access issues.

Although the harvest performance for the period 2010 to 2018 showed that 93 percent of stands harvested had volumes above 200 cubic metres per hectare with the lowest being 170 cubic metres per hectare, a minimum harvest volume criterion of 140 cubic metres per hectare was applied in the base case. This was in response to licensee input suggesting that lower volume stands are being utilized and their harvest would become increasingly common in the future.

In the base case, stands were considered merchantable if they contained 140 cubic metres per hectare of live volume and were at least 80 years of age. For mature stands affected by the mountain pine beetle, the minimum live volume criterion was lowered to: 125 cubic metres per hectare for balsam-leading stands, 80 cubic metres per hectare for pine-leading stands and 82 cubic metres per hectare for spruce-leading stands. When the dead volume in these stands is considered, the total stand volume exceeds 140 cubic metres per hectare.

As described under '*Base case for the Lakes TSA*', the harvest flow objective used to prepare the base case was to maintain a sustainable live volume harvest flow while capturing dead volume. Low (live) volume stands included in the base case contribute about 292 000 cubic metres per year of live volume and 265 000 cubic metres per year of dead volume in the first 10 years of the projection. This suggests that a sustainable harvest flow of live volume, and the continued recovery of dead timber, are highly dependent on harvesting these low live volume stands in the short term.

Several sensitivity analyses were conducted to test the impact of adjustments to the minimum harvestable criteria on base case timber supply. Increasing the minimum harvestable volume to 170 cubic metres resulted in harvest levels 22 percent lower than projected in the base case in the short term and nine percent lower in the long term. Reducing the minimum harvestable volume to 100 cubic metres resulted in harvest levels nine percent higher than projected in the base case in the short term, with no impact to the long term. These results show that short-term harvest levels are very sensitive to changes in the minimum harvestable

volume criterion. This indicates that deviations from the base case merchantability assumptions will affect the sustainability of timber supply in this TSA.

Licensee and public input suggested the minimum harvestable criteria should not be based on age. In response, a sensitivity analysis examined the impact of removing the age criterion. This increased short-term timber supply by 10 percent but decreased long-term timber supply by 5.6 percent. In the base case harvest forecast, the timber supply is not limited by age for existing mature stands as most of the current mature stands are older than 80 years. For existing regenerating stands and future managed stands, the results show that while these stands may reach the minimum volume criterion before they are 80 years of age, harvest levels will be higher if these stands were allowed to grow to 80 years of age or older.

Other concerns regarding the minimum harvestable criteria were expressed from licensees, Cheslatta Carrier Nation, and the public. They included: the minimum harvestable volume criterion should be lower than what was modelled in the base case and sensitivity analyses and conversely, concerns that the minimum volume assumptions used in the base case was overly optimistic. District staff recommended a partition, limiting the amount of live volume harvested from stands with more than 140 cubic metres per hectare, to maintain a sustainable timber supply and encourage the utilization of pine beetle affected, low live volume stands.

During my field tour of the TSA I observed that most of the stands include a mix of live and dead timber. I saw harvesting in stands with significant mortality and in discussions with licensees, it is evident that they are adapting their harvesting practices to reflect the current timber profile of the TSA.

Although the harvest records to date have not demonstrated performance in low, live volume stands, I note that the ability of the licensees to maintain a sustainable harvest level is dependent on their ability to shift their harvesting priorities to low volume stands so that management practices are consistent with the base case forecast assumptions. The live volume harvest level of 400 000 cubic metres per year indicated in the base case can only be realized if licensees immediately focus their performance in low live volume stands. Specifically:

- stands with less than 170 cubic metres per hectare; and,
- beetle-affected stands where the minimum live volume is 125 cubic metres per hectare for balsam-leading stands, 80 cubic metres per hectare for pine-leading stands, and 82 cubic metres per hectare for spruce-leading stands. These stands contain a significant proportion of dead volume.

Although I am not implementing a low live volume partition at this time, this AAC decision is predicated on licensee performance in low live volume stands. Failure to do so puts the sustainability of the timber supply in the Lakes TSA at risk. Therefore, as discussed under **'Implementation'**, I expect licensees and BCTS to work with Ministry staff to carefully plan and monitor harvest performance in low live volume stands and report back to me annually. I will evaluate the harvest performance and if necessary, make an adjustment to the AAC.

In addition, I am aware that licensees are currently examining the feasibility of applying commercial thinning to obtain some timber from young stands. Commercial thinning is a silviculture treatment that 'thins' out an overstocked stand by removing trees that are large enough to be used for some product. This practice is intended to improve the health and the rate of growth of the remaining trees.

Although there is value associated with commercial thinning, I note it is not a current management practice in the Lakes TSA and work remains to be done to assess stand suitability, and health and timber supply impacts. Further, given the potential negative impact of harvesting stands before their growth rate and volume yield can be maximized, I caution licensees to be mindful of the risks to timber supply of not targeting the appropriate stands. Should commercial thinning be undertaken, I expect full fibre utilization without leaving unused fibre on site to rot or burn.

*- deciduous component of coniferous-leading stands*

In the Lakes TSA, the demand for the utilization of the deciduous component of coniferous-leading stands is low. To reflect this, the volume of deciduous species was excluded from yield tables in the base case projection.

In response to comments from the forest industry suggesting deciduous volume should be included in the base case harvest projection and that deciduous species were being used in bioenergy facilities, a sensitivity analysis was conducted. The results of this sensitivity analysis show that including the deciduous component of coniferous-leading stands would increase the short-term timber supply by 10 percent (40 000 cubic metres per year) and the long-term timber supply by one percent (9000 cubic metres per year).

I have reviewed records from the Harvest Billing System (HBS) showing that in the past five years, a total of 4942 cubic metres of deciduous volume was billed within the Lakes TSA. I have also reviewed information collected under FREP that shows there is a higher proportion of deciduous retained within cutblocks than the proportion naturally present within the CMFLB. Further, as discussed above under ‘*problem forest types*’, deciduous species make an important contribution to carbon sequestration, wildlife habitat and biodiversity. However, I recognize bioenergy facilities have recently increased their utilization of deciduous and there is a growing demand from Asian markets for a clean-energy source such as wood pellets. I also recognize there is an opportunity to innovate and mitigate reductions in timber supply by harvesting the deciduous component of coniferous-leading stands.

From the information described above, I conclude it is reasonable to increase the base case harvest level to incorporate the contribution of the deciduous component of coniferous-leading stands. However, due to the performance to date, stand-level biodiversity requirements, and the value of deciduous for wildlife habitat, biodiversity and carbon sequestration, I will consider only one half of the potential supply of deciduous volume from coniferous-leading stands. An increase of 20 000 cubic metres per year in the short-term timber supply would provide enough opportunity for innovation while minimizing risks to wildlife, biodiversity and carbon sequestration.

To encourage the use of this volume and ensure it is from deciduous and not coniferous species, I am implementing an AAC partition of 20 000 cubic metres per year for deciduous volume. I discuss these considerations further under ‘*partition options and implications*’ and ‘**Reasons for Decision**’.

In order to better quantify the contribution of deciduous volume to the overall harvest for the next timber supply review, I expect district staff to work with licensees to ensure that the harvest of deciduous volume from coniferous-leading stands is monitored on an annual basis.

**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

*- interior log grade change*

In 2006, new log grades were implemented for the BC Interior. Previously, a log was assessed according to whether the tree was alive or dead at the time of harvest. Under this grading system, Grade 3 endemic (the ‘normal’ mortality observed in a mature stand) and Grade 5 (dead tree with less than 50 percent firmwood and/or where 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 whether it was alive or dead at harvest. These changes resulted in the inclusion of logs (i.e., dead potential log grades 3 and 5) in the AAC accounting that had not been previously included.

The base case timber supply analysis did not account for increased timber volumes due to the log grade change since the growth and yield models only project live volume. Based on data from inventory audit plots, endemic dead potential volume in the Lakes TSA is estimated at approximately 6.7 percent of the volume from existing stands older than 60 years of age. As the current vegetation resource inventory for the Lakes TSA includes the identification of dead volume for stands with greater than 30 percent mortality, FAIB staff advised me it is reasonable to assume this inventory estimate of dead volume includes endemic

dead potential. After accounting for the proportion of the THLB that is greater than 60 years of age, staff concluded that the remaining dead potential volume is approximately three percent.

I agree with the information provided by FAIB regarding dead potential volume and that the base case underestimates timber supply by up to three percent. I account for this underestimation under '**Reasons for Decision**'.

*- grade 4 volume and credit*

Provisions of the *Cut Control Regulation and the Provincial Logging and Waste Measurement Procedures* were developed to provide an incentive for the harvest of low-quality logs and higher levels of fibre utilization, particularly in areas impacted by the mountain pine beetle. Specifically, Section 17(6) of the Cut Control Regulation allows licence holders to adjust downward the volume harvested in the cut control of their licence for grade 4 volume delivered to a non-sawlog facility. Although the provision for grade 4 cut control policy was intended to provide an incentive for the harvest of low-quality logs and higher levels of fibre utilization, it can result in harvesting above the level of the AAC. With recent amendments to the Provincial Logging and Waste Measurement Procedures, all grade 4 residual volume left at harvested sites will be charged against licensee's cut control.

Input provided by Babine Forest Products and Decker Lake Forest Products requested that grade 4 volume not be charged against the sawlog AAC. They suggested that it should be charged against a dead timber AAC partition. Public input suggested a relaxation of scaling procedures for volume going to non-sawlog facilities.

Based on a review of harvest records, grade 4 volume currently accounts for 11.5 percent of the total volume billed (or scaled) in the Lakes TSA and 12 percent of that volume was delivered to non-sawlog facilities and credited under the Cut Control Regulation. I commend this performance and I encourage licensees to work with the Ministry to develop procedures to ensure wood fibre is fully extracted during harvesting and subsequently fully utilized.

Better use of fibre from damaged and low value forest stands is increasingly seen as way to reduce waste, diversify forest products, support secondary manufacturers (such as pulp, chipping and pellets plants), and contribute to the local economy while supporting the sustainability of ecosystem values. I therefore encourage licensees to prudently apply this tool by ensuring that its use does not result in a rate of harvest higher than the determined AAC, putting the sustainability of other ecosystem values and the timber supply at risk.

I am satisfied that the assumptions applied in the base case for grade 4 credits reasonably reflect demonstrated forest management and the best available information. To ensure any future use of this credit does not negatively impact timber supply or other ecosystems values, I expect Ministry staff to monitor the use of grade 4 cut control credits and report any concerns to the chief forester.

**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

*- landscape level biodiversity – seral stage distribution*

Biodiversity is the diversity of plants, animals and other living organisms in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems. A key landscape-level biodiversity consideration is to maintain forests that mimic important characteristics of natural forest conditions, such as a variety of seral stages.

In the Lakes TSA, seral stage objectives have been legally established by the Lakes North and Lakes South SRMPs. These objectives recognize the importance of mature and old seral stages for maintaining various lifeforms and wildlife habitat. As such, they set minimum retention requirements for mature and old forests, and a maximum disturbance area in landscape units and in the caribou migration zone.

Currently, there is a deficit of forests older than 250 years in the ESSF biogeoclimatic (BEC) zone throughout the TSA and a deficit of mature and/or old forests in the Burns Lake East, and Intata/Ootsa landscape units. These deficits are attributed to existing natural conditions for the ESSF BEC zone and to the 2018 wildfires elsewhere. Within the Chelaslie Caribou Migration Corridor, the early-seral requirement for the moderate use migration corridor has been exceeded for the past decade due to harvesting activities. In the high use migration corridor, large wildfires in 2014 and 2018 drastically increased the early-seral conditions and created a deficit of mature and old forests.

Licensees have expressed concerns regarding changes in age class distributions due to the mountain pine beetle and the way this is reflected in the new vegetation resource inventory (VRI). They have also expressed concerns around modelling assumptions for seral stage distribution, particularly regarding the impact of, and accounting for, natural disturbances. Fraser Lake Sawmills suggested that non-harvested stands should be allowed to age indefinitely. In response, the base case analysis is based on the age indicated in the VRI and stand aging was modelled to capture both current management practices, and the natural processes occurring on the land base, using the best available information. Therefore, all eligible stands in the THLB were harvested and stands outside of the THLB were disturbed when they reach 250 years of age in the SBS zone or 350 years of age in the ESSF zone.

Babine Forest Products and Decker Lake Forest Products requested an update to the seral stage targets to account for large landscape-level disturbance such as beetle epidemic and wildfires. Although changes to land use objectives are outside the scope of authority of the chief forester, regional and district staff informed me seral stage targets for the Lakes TSA reflect natural disturbance types. For most of the TSA, the natural disturbance type is conducive to frequent stand-initiating events (NDT-3). Historically, these events were wildfires that ranged in size from small spot fires to conflagrations covering tens of thousands of hectares. The resulting forest mosaic includes even-aged regenerating stands, ranging in size from a few hectares to thousands of hectares, with mature forest remnants.

I have reviewed the information provided to me and based on this review, I am satisfied the base case assumptions for seral stage distribution reflect established objectives. However, I am aware that in the neighboring Morice and Prince George TSAs, ESSF stands older than 140 years are considered 'old', versus 250 years in the Lakes TSA. Therefore, I encourage Ministry staff to review old growth thresholds for the ESSF BEC zone in the Lakes TSA, to ensure the seral stage ages are correct.

To address the high level of disturbance in the Lakes TSA and ensure adequate biodiversity targets are maintained, I expect Ministry staff to work with licensees to develop and implement a strategy for the recruitment and management of mature and old seral targets. This strategy should be aligned with approved FSPs and incorporated as part of the cutting permit application process. I have noted these expectations under '**Implementation**'.

*- wildlife habitat areas*

Under FRPA, there are three categories of identified wildlife that may require special management attention to address the impact of forest activities: species at risk, regionally important wildlife and specified ungulate species. These species are managed through the establishment of general wildlife measures (GWM), wildlife habitat areas (WHA), ungulate winter ranges (UWR), or through other management practices specified in higher-level plans.

The Lakes TSA supports populations of species at risk such as caribou, bull trout, and grizzly bear and ungulates such as mountain goats, moose and deer.

A variety of management tools have been used to conserve sufficient habitat for the survival of identified species present in the Lakes TSA: seral stage targets have been established for the Chelaslie Caribou Migration Corridor used by the Tweedsmuir herd; an UWR has been established for mountain goat; and approved FSPs include seral stage distribution commitments for areas associated with grizzly bear, moose and deer. However, the effectiveness of these management tools in meeting habitat needs is not monitored and management tools for some species have yet to be implemented (i.e., Takla Caribou Herd).

Although I have accepted that established wildlife habitat requirements were adequately modelled in the base case, I expect Ministry staff to complete a comprehensive regional wildlife assessment. This would be used to evaluate the conditions and distribution of identified species; and the effectiveness of current management tools in maintaining and recovering habitats, and this information would be incorporated into future timber supply reviews. I have discussed this further under '**Implementation**'.

#### *visual quality objectives*

Visual quality objectives (VQOs) prescribe the extent of forest alteration that can result from the size, shape and location of cutblocks and roads. In the Lakes TSA, scenic areas and visual quality objectives (VQOs) were legally established, amended, or repealed under the Government Action Regulation (GAR) on March 15, 2010.

In the base case, visual quality objectives were modelled by specifying a percentage of forest land within each visual polygon that could be below a given visually effective green-up height. The percentage modelled is the mid-point of the permissible range of alteration of forested area that can be below a given visually effective green-up height.

Sensitivity analyses show that applying the minimum permissible alteration resulted in a 0.3 decrease in short-term timber supply and a two percent decrease in long-term timber supply. Applying the maximum permissible alteration resulted in no change in short-term timber and a 0.2 percent increase in long-term timber supply. An additional sensitivity analysis removing all VQO requirements within the Lakes TSA showed no timber supply impact in the short term and an increase long-term timber supply of 0.47 percent.

I have considered the information about the objectives for visual quality in the Lakes TSA and how this information was modelled in the base case, and I accept that it was modelled appropriately. I am aware that in this TSA, scenic areas overlap other special management areas such as connectivity corridors, wildlife habitats, or old growth management areas. In response to licensee and public input regarding the perceived level of timber supply constraints imposed by visual quality objectives, I note managing for visual quality has very little to no impact on timber supply. However, I acknowledge community concerns regarding wildfire risks and I am aware that portions of scenic areas close to communities may be identified for fuel mitigation treatments in Community Wildfire Protection Plan (CWPP). Therefore, I support district and licensees working together to evaluate potential changes to visual quality objectives for fuel mitigation purposes, and any new information can be incorporated into the next timber supply review.

#### Other information

##### *- hydrological considerations*

There are no designated community watersheds or fisheries sensitive watersheds within the Lakes TSA and accordingly, the base case timber supply analysis did not include specific hydrological considerations.

In the 2011 AAC determination rationale, the chief forester expressed concerns about the hydrological integrity of watersheds with large-scale harvest and expected the next timber supply analysis to incorporate equivalent clearcut area (ECA) assumptions. ECA represents the amount of hydrological recovery in a watershed based on forest canopy conditions. It is an indicator of the potential effect of past and proposed forest harvesting on peak water flows.

As discussed further under '*cumulative effects*', an ECA protocol has been developed under the provincial Cumulative Effects Framework. However, this protocol only considers man-made disturbances and no formal protocols have been established for areas severely impacted by mountain pine beetle or wildfires.

I conclude that improved ECA protocols are especially important given the high level of disturbances in the Lakes TSA, the role of hydrological regimes on ecological functions, and the risks associated with changes in these regimes. Consequently, I expect Ministry research staff to complete a comprehensive watershed assessment for the Lakes TSA for incorporation into the next timber supply review. I have addressed this further under '**Implementation**'.

- *cumulative effects*

British Columbia's Cumulative Effects Framework (CEF) defines cumulative effects (CE) as the combined effects of past and present human activity and natural disturbances on environmental, social and economic values. Currently, assessment protocols for aquatic ecosystems, grizzly bear, and old growth forests have been approved for implementation. For the Lakes TSA, cumulative effects assessments (CEA) were completed for aquatic ecosystems and grizzly bear. An old growth assessment was not conducted as old growth management areas and old seral requirements have been legally established and incorporated into the base case.

As part of the aquatic ecosystem CEA, road density within 100 metres from a stream, total land disturbance, and peak flow index (ECA) were considered by watershed units. These indicators relate to aquatic functions and processes such as water inception and routing, turbidity and sedimentation or aquatic habitat connectivity. The results show that for most of the TSA, road density within 100 metres of a stream exceeds 0.3 kilometres per square kilometre, which is considered high. The results also show that with a few exceptions, more than 66 percent of the watershed area had been disturbed. The majority of the disturbance is attributed to insects, fires and human disturbance. Regarding ECA, only human-caused disturbances were considered. This resulted in 49 percent of the watersheds being assessed as having a low ECA, 40 percent as moderate and 11 percent as high.

The provincial assessment protocol for grizzly bear is based on indicators that relate to grizzly bear habitat and population. These indicators include road density, forage supply, and bear density, and are assessed at the landscape unit level and grouped by grizzly bear population unit (GBPU). With higher road densities, grizzly bear mortality and habitat avoidance increases. Regarding forage, grizzly bears rely on berry patches as an important food source and the dense closed canopy characteristics of mid-seral conifer forests is typically not suitable for berry production. The results of the assessment show that with the exception of the Babine East landscape unit, road density is very high (greater than 0.75 kilometres per square kilometre) throughout the TSA. More than 30 percent of the forest stands within the Burns Lakes East, François East and Cheslatta landscape units are mid-seral and have low forage suitability. Lastly, based on population size models, most landscape units are estimated to have a low density of bears (less than 10 bears per thousand kilometres).

Based on the information described above, I recognize that increasing road densities create a high risk to aquatic ecosystems and a very high risk to grizzly bear habitat and populations. This finding underscores my comments regarding road decommissioning, which are described above under '*estimates for roads, trails and landings*'. Further, to better coordinate and integrate cumulative effect assessments into timber supply review, I expect Ministry staff to inventory existing roads according to the risk to forest values and prepare management guidelines that manage the risk to aquatic ecosystems and grizzly bear and, wherever possible, to report on the size and health of the grizzly bear population. I discuss these expectations further under '**Implementation**'.

- *carbon sequestration*

The 'carbon cycle' refers to the constant movement of carbon from land and water through the atmosphere and living organisms. Forests are a vital part of the carbon cycle, both storing and releasing carbon in a dynamic process of growth, decay, disturbance and renewal, thus making them important from a carbon and climate change mitigation perspective.

Forests act either as carbon sources or carbon sinks. A forest is considered a carbon source if it releases more carbon than it absorbs. A forest is considered a carbon sink if it absorbs more carbon from the atmosphere than it releases. The net ecosystem carbon balance (NECB) is used to describe the net change between the given ecosystem and atmosphere. If the atmosphere is used as a base, a positive NECB means the atmosphere carbon pool is increasing and the given ecosystem is a carbon source, while a negative NECB means the atmosphere carbon pool is decreasing and the ecosystem is a carbon sink.

Five terrestrial carbon pools have been defined by the Intergovernmental Panel on Climate Change (IPCC): above ground biomass carbon, below ground biomass carbon, dead organic matter, forest floor litter, and soil organic carbon. The sum of all five pools is referred to as total ecosystem carbon (TEC).

A carbon analysis of the base case harvest flow was completed by using carbon budget model – Canadian forest sector version 3 (CBM-CFS3) to project carbon dynamics over the first 100 years. Overall, TEC increased about 4.9 percent over the 100 years modelled with a 1.3 percent increase on the THLB and a 10.9 percent increase on the non-THLB.

A harvest wood product (HWP) factor of 27.25 percent was used to account for carbon stored in wood products after 100 years. Considering emissions projected from wildfire (0.08 Mt CO<sub>2</sub>e per year), harvesting (0.40 Mt CO<sub>2</sub>e per year), and slash burning (0.38 Mt CO<sub>2</sub>e per year), and of carbon stored in HWPs, the TSA is projected to be a carbon sink with an annual carbon gain of around 0.83 Mt CO<sub>2</sub>e with about 18.2 percent of that coming from HWP.

The depth of the carbon analysis conducted for the Lakes TSA and the detailed information is particularly useful to understand the impact of the base case projection on forest carbon and greenhouse gas emissions. The information demonstrates the value of carbon to forest ecosystems and shows how forest management practices can contribute to climate change mitigation efforts by promoting carbon uptake and storage. Specifically, I note the significant loss of ecosystem carbon from slash burning and I recognize that practices enabling better biomass utilization can reduce greenhouse gas emissions. I have considered this information in my determination, as discussed above under *'deciduous component of coniferous-leading stands'* and *'grade 4 volume and credit'*.

- *climate change*

Consideration of the impact of climate change in AAC determinations aligns with the Ministry's Climate Change Strategy to incorporate climate change into decision making. During the period 1926 to 2018 in the Lakes TSA, mean annual precipitation remained relatively unchanged; however, winter precipitation has declined by 25.6 percent. During the same period, mean annual temperature has increased by 0.6°C and extreme minimum temperatures have warmed by 3.5°C, mostly in the winter.

Compared to the observed climate between 1961 and 1990, climate model projections for the Lakes TSA suggest that by 2050, snow precipitation will decrease by 20.1 percent, mostly in the spring (-51.5 percent) and fall (-31.4 percent). These projections also suggest that frost-free period and growing degree days will increase, likely enhancing tree growth in the TSA, but evaporative demand is projected to increase leading to moisture stress and drought.

Data from aerial overview surveys conducted by the Ministry from 2008 to 2018 indicate increased levels of forest pests such as mountain pine beetle and balsam bark beetle. Climate projections of decreased snow precipitation, increased frost-free period and evaporation demand are conducive to increased potential for insect outbreaks due to the higher likelihood of tree stress, host stress and susceptibility and a more favorable climate for many forest pests to thrive. Outbreaks of bark beetles are predicted to increase in both frequency and severity. Climate projections of warm, wet springs coupled with warmer minimum temperatures may increase the risk of fungal pathogens and rusts in deciduous stands of all ages and young coniferous stands. Further, projections of increasing temperatures, lower snowpack, and enhanced evaporative demands are favourable to increasing fire frequency, severity and season length.

Biogeoclimatic Ecosystem Classification (BEC) climate model projections (2011-2040) indicate there may be pockets of climate conditions favorable to Interior Douglas-fir (IDF) and Interior Cedar Hemlock (ICH) zones. By the 2080s, the climate may be more like the IDF and ICH zones and much less like the climate of the sub-boreal spruce (SBS) and Engelmann Subalpine Fir (ESSF) zones. Using a stand-level drought risk assessment tool which projects the risk of tree mortality by BEC variants based on climate projections, subalpine fir, birch and hemlock may be at high risk on sites with average moisture conditions within the ESSF and SBS zones.

Several recommendations have been put forward for addressing climate change impacts to timber supply. These mitigation/adaptation options have been developed with input from regional hydrology, fire, ecology, entomology, pathology, geomorphology and silviculture specialists as well as information from the *Skeena Region Climate Action Plan* and the *Adapting Forest and Range Management to Climate Change in the Skeena Region Extension Note*. The recommendations include:

- *Fire management* - Incorporate fire management into all land base decisions within the Lakes TSA and collaborate with BC Wildfire Service to mitigate the impacts to timber supply given projections of increased frequency and intensity of fire with climate change; increase fire resiliency with strategic fuel breaks, prescribed fires in appropriate locations, and consider fire management stocking standards; increase spring fire season response readiness, especially in years with dry autumns, low snowpack and/or warm, dry springs.
- *Drought risk assessment* - Adapt the Stand-Level Drought Risk Assessment Tool to the Lakes TSA to assess drought risk. Specifically, promote partial cutting of stands on dry sites to retain shelter and soil moisture, conserve snowpack, and increase fire resiliency and retain areas of low drought risk to promote watershed health and future timber supply.
- *Tree species selection* - Promote use of best available knowledge for planting seedlots that will be better suited to future climates (e.g., Climate Based Seed Transfer Guidelines) and monitor progress; conduct research using the Climate Change Informed Species Selection tool to identify potential new tree species for regeneration and continue monitoring results from assisted migration research trials; and increase tree species and stand-structure diversity to mitigate possible losses associated with climate change and reduce impacts to biodiversity. I note that in the Nadina District, stocking standards that were based on future climate data were approved in all FSPs.
- *Pest management* - Coordinate efforts to proactively reduce known triggers for insect population increases, such as industrial movement of infested timber, spread of invasive species, encourage the active removal and management of good pest breeding sites (e.g., areas of wind throw or old, stressed timber) and consider the natural range of variation at rotation age to limit the possibility of large scale outbreaks of forest pests impacting future timber supply.
- *Research and monitoring* - Initiate a vulnerability analysis of the increased risk of conifer regeneration failure due to potential drought; increase monitoring effort of diseases, specifically rusts and venturia blight, given continued projections of warm, wet spring conditions and summer minimum temperature increases; support and increase research and monitoring efforts aimed at quantifying the current impacts of climate change and improving model projections within the Lakes TSA to provide recommendations for future timber supply reviews and AAC determinations.
- *Carbon sequestration* - Maintain and enhance forest carbon sinks, an objective of the Ministry's Forest Carbon Strategy, in areas that provides additional climate-change mitigation benefits such as by increasing riparian retention areas of streams and wetlands (reduces the impact of warmer temperatures to aquatic habitat, maintains bank stability to decrease the impact of potential increases in storms/flooding events, and reduces the impact of evaporation during times of low flow/drought) and rehabilitating roads no longer in use (creates wildlife habitat and restores natural drainage).
- *Forest operations* - Reduce expectations of the winter harvest season in the Lakes TSA to avoid operating in unfavourable conditions that could lead to site degradation. Consider greater stockpiles of logs may be needed to keep mills working during freeze-up, break-up, or periods of mid-winter thaw due to road closures. Continue to monitor such piles for pests and process before pest flight windows, if applicable.
- *Hydrology* - Incorporate information from regional water planning tools and hazard mapping to identify potential hazards due to current and future peak flow (floods) and sedimentation as well as low-flow risk to aquatic ecosystems by considering environmental flow needs and the combined impacts of climate change and harvesting; promote a broader range of age-classes at the watershed scale and limit extensive second growth to reduce risk of exacerbating low flows that are likely to be more common with climate change in the Lakes TSA.

Public input generally expressed an awareness of climate change and its role in recent insect infestations and wildfires. One member of the public commented that recurring drought conditions are happening and that climate change projections need to be more emphasized in management practices, with attention to

reforestation strategies. A Ts'il Kaz Koh First Nation representative expressed concerns about the impact of future fires on the AAC.

In the base case, past and current climate-related forest health impacts and disturbances from fire were accounted for. Having reviewed the information regarding climate change implications for the forest of the Lakes TSA, I acknowledge the work done to date and support the above recommendations. Specifically, I support district staff working with licensees to promote partial cutting on dry sites, rehabilitating roads no longer in use and limiting extensive areas of second-growth forests.

Ongoing observations, data collection, analysis and discussions through various working groups will enable an understanding of the timber supply implications and possible mitigation measures in future timber supply reviews. I expect Ministry staff to work with licensees to implement mitigation options that would lessen the impact of climate change to timber supply while protecting other values and promoting forest regeneration suitable for future climates. I expect Ministry research staff to enhance climate and forest health monitoring within the Lakes TSA to decrease uncertainty and improve model projections. In addition, I expect FAIB staff to work on integrating climate change projections into timber supply, growth and yield, and natural disturbance models to better inform future AAC determinations. I have discussed these expectations further under '**Implementation**'.

#### *- harvest performance*

Annual harvest levels in the Lakes TSA have averaged about 66 percent of the AAC since 2011. Licensees have focused their harvesting on pine to salvage trees killed by the mountain pine beetle. Harvest Billing System data shows that during the mountain pine beetle infestation, about 75 percent of the total volume harvested was pine. Since 2012, the percentage of pine harvested has remained high, fluctuating from 67 to 78 percent, with 52 to 61 percent of the total volume harvested being dead.

Regarding the non-pine species partition in place since 2011, an average of 360 093 cubic metres of non-pine species has been harvested annually. I note this is about nine percent above the partition and I discuss this further under '*partition options and implications*'.

#### *- unused AAC disposition*

District and regional staff inform me that there is a net total of 293 411 cubic metres in unharvested volume that has accumulated since 2010. This volume is from existing replaceable forest licences, current and expired non-replaceable forest licences and volume allocated to BCTS.

The base case harvest forecast is predicated on the condition of the forest, including the amount of merchantable timber growing stock present as of the date of the timber supply analysis. The standing forest was not depleted to account for potential harvesting of any accumulated unharvested ('undercut') volume in the Lakes TSA. Therefore, any volume harvested (including undercut volume) that is above the AAC in this determination, constitutes use of the growing stock at a greater rate than projected in the base case, if the AAC were fully utilized. This could threaten the stability of future timber supply.

In February 2018, a new *Policy Regarding the Administration of Unharvested Volume, Uncommitted Volume and Unused BCTS Volume* took effect. This policy outlines the process to be undertaken to inform the chief forester how much of the accumulated volume will be awarded during the next AAC determination period. Any undercut volume that is not carried over into the next AAC determination period will no longer be available for future tenure disposition.

Due to current age class and species distribution in the Lakes TSA, there is no flexibility to achieve the base case harvest level if the growing stock is harvested at a rate greater than projected in the base case. I note that any allocation and utilization of volume above what is provided for within my AAC, puts the timber supply for the TSA at risk.

#### *- partition options and implications*

When making AAC determinations, the chief forester can specify portions of the harvest attributable to different timber types, geographic areas or types of terrain. This is referred to as an AAC partition. The aim of an AAC partition is to support sustainable use of the timber resource within the context of all applicable

legislative objectives. A partition can help ensure that the allowable timber harvest attributable to certain types of timber, terrain or areas of the TSA is not taken from another (potentially higher value) area or type of forest. A partition may also be applied to encourage use of the timber volume of different areas and timber types assumed to contribute to the AAC.

Historically, AAC partitions identified problem or marginal timber in order to encourage harvest performance in these stands. More recently, AAC partitions delineate timber that is typically of a higher value and/or in a more limited supply, that is at risk of overharvesting. An AAC partition therefore identifies the maximum harvest volume that the chief forester considers is available within the specified timber type, terrain type or geographic area. An AAC partition informs licensees and the public of a harvest limit but it does not directly regulate the harvest from that type of timber.

Under the *Forest Act*, after the chief forester sets the partition for a TSA, the minister may set harvest limits to enforce the partition within individual licence agreements. If the minister does not set harvest limits, voluntary compliance with the partition is expected of the licensees.

Babine Forest Products, Decker Lake Forest Products, Fraser Lake Sawmills, Lakes TSA Stakeholders Group, Cheslatta Carrier Nation and members of the public all expressed support for a live/dead partition to encourage the continued use of dead timber and sustainably manage live timber.

Licensees suggested a partition could be established to increase timber supply and incent opportunities for logging deciduous trees and for harvesting on steep slopes. Licensees and Lakes TSA Stakeholders also suggested a partition should be considered for commercial thinning purposes.

Fraser Lake Sawmills asked that a partition for low-volume stands (less than 140 cubic metres per hectare) be considered to incent utilizing and tracking of these stands.

Babine Forest Products and Decker Lake Forest Products requested partition options for every potential opportunity to offer incentives to innovate and harvest the full profile. Additional identified opportunities included bioenergy and wildfire.

In addition, Cheslatta Carrier Nation believes AAC partitions should be established to ensure focus on burned and beetle-killed timber and to set the stage for the creation of specific tenures for these types of timber.

Based on this input, FAIB and district staff presented the following options for my consideration:

- *Non-pine coniferous species*: discontinue the non-pine coniferous species partition established in 2011 as harvest is shifting away from MPB-impacted pine.
- *Utilization of deciduous species*: a partition should be considered if the use of deciduous is expected to significantly contribute to the harvest.
- *Live/dead*: partition the live and the dead components of the profile to maintain a sustainable timber supply and encourage the salvage of dead pine for as long as it is economically feasible.
- *Stands with volumes greater than 140 cubic metres per hectare*: partition the amount of live volume from stands with more than 140 cubic metres per hectare to encourage the utilization of marginally economic stands and maintain a sustainable timber supply.
- *Other timber types/areas*: the utilization of low productivity stands and stands on slopes steeper than 40 percent should be encouraged and monitored.

The 2011 AAC included a 350 000 cubic metres partition attributable to non-pine species. Following the 2016 AAC adjustment, the partition amount was reduced to 288 516 cubic metres. At the time this partition was established, mature pine-leading stands dominated the landscape. Young pine plantations now occupy the largest proportion of the forested land base and most mature stands are spruce-leading. For these reasons, I will discontinue the non-pine coniferous species partition.

As discussed above under '*deciduous component of coniferous-leading stands*', to date there has been little demonstrated harvest performance in the deciduous component of coniferous-leading stands. However, they

play an important role in maintaining biodiversity, providing for wildlife habitat, and sequestering carbon. There is also a market demand for bioenergy products and an opportunity to innovate and mitigate reductions in timber supply by harvesting the deciduous component of coniferous-leading stands. To encourage the use of this volume I will implement the following partitions:

- *Live coniferous volume*: A maximum of 400 000 cubic metres per year is attributable to live coniferous volume;
- *Live deciduous volume*: A maximum of 20 000 cubic metres per year is attributable to live deciduous volume.

The base case projects that for the next decade, 400 000 cubic metres of live coniferous volume could be harvested and 400 000 cubic metres of dead volume associated with the live harvest may be available. As discussed below under ‘*dead volume from fire-impacted stands*’, I have accounted for an underestimation of 150 000 cubic metres attributable to dead volume from the 2018 fires. In order to maintain a sustainable timber supply and encourage the salvage of dead pine if it is economically feasible, I will implement the following partition:

- *Dead volume*: A maximum of 550 000 cubic metres per year is attributable to dead volume.

It is my expectation that district staff will work with licensees and BCTS to monitor and assess harvest performance within the species partitions and report back to me if adjustments are necessary in the next AAC determination.

**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 letter*

The Minister of Forests, Lands, Natural Resource Operations and Rural Development has expressed the economic and social objectives of the Crown for the province, in a letter dated October 30, 2017. In it, he emphasizes the BC Government’s commitment to building a strong, sustainable innovative economy and creating well-paid jobs in the province. The letter identifies Government’s three objectives for the management of BC’s forests and Crown lands that are relevant to AAC determinations. These are:

1. modernizing land use planning to effectively and sustainably manage BC’s ecosystems, rivers, lakes, watersheds, forests and old growth forests;
2. expanding investments in reforestation; and,
3. developing strategies for the management of wildlife resources and habitat (in collaboration with relevant Natural Resource Ministries, indigenous partners, and industry).

The October 30, 2017 letter also asks that I ensure the Ministry’s approved strategies for delivering its forestry objectives are integrated into the Timber Supply Review (TSR) process.

With respect to First Nations, the letter suggests I ensure AAC determinations take into consideration relevant agreements between First Nations and the Government of BC, and court decisions that define Aboriginal title and rights. In addition, it reinforces Government’s commitment to move forward on reviewing policies, programs, and legislation to determine how to bring the United Declaration on the Rights of Indigenous Peoples (UNDRIP) into action with respect to AAC determinations. It asks that I consider traditional knowledge and other input from BC First Nation communities and organizations as they pertain to the AAC determination.

The Minister asked for consideration as to how AAC determinations can support Government’s objective to focus on planning and sustainable resource management in a way that support robust forest recovery and timely and effective responses to emerging threats from factors such as insect infestations and wildfire while promoting forest health and values.

As well, the Minister asks that I ensure the TSR process incorporates the best available information on climate change and the cumulative effects of multiple activities on the land base and explores management options that align with established climate change strategies, adaptation and mitigation practices. Where the cumulative effects of timber harvesting and other land-based activities indicate a risk to natural resource values, the Minister asks that I ensure the TSR identifies those risks for consideration in land-use planning.

Finally, the minister suggested the chief forester should consider the environmental, social and economic needs of local communities as expressed by the public during TSR processes, including strategies that contribute to community economic stability, and the jobs that the forest sector creates in communities, where these are consistent with the government's broader objectives. When faced with necessary reductions in AACs, that those reductions be no larger than necessary to avoid significant longer-term impacts.

With respect to the Minister's letter, I note that the base case and alternative harvest projections, prepared for this determination, have the primary objectives of maintaining a sustainable live volume harvest flow while capturing dead volume, and attaining 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 insect infestations and wildfire while promoting forest health and values in the Lakes TSA.

During my consideration of the factors required under Section 8 of the *Forest Act*, I have considered both the local objectives, as provided in the Lakes District LRMP and associated plans and orders, as well as the objectives of First Nations. I have considered the socio-economic objectives expressed in the 2017 letter in this determination for the Lakes TSA, and have reviewed the public consultation process undertaken by the district and considered the input received in making my determination. On this basis, I am satisfied that this determination accords with the objectives of Government as expressed by the Minister.

#### *- First Nations consultation*

The Lakes TSA is overlapped by the asserted traditional territories of the Cheslatta Carrier Nation, Nee Tahí Buhn Band, Skin Tyee Nation, Wet'suwet'en First Nation, Ts'il Kaz Koh First Nation, Lake Babine Nation, Office of the Wet'suwet'en Hereditary Chiefs, Stellat'en First Nation, Nadleh Whut'en Band, Takla Lake First Nation, Ulkatcho First Nation, Tl'azt'en First Nation and Yekooche First Nation. All First Nations are, or have been, active participants in the forestry sector in either the Lakes TSA or in neighbouring TSAs.

Within the total area of the Lakes TSA, Cheslatta Carrier Nation, Lake Babine Nation, Nee Tahí Buhn Indian Band, Skin Tyee Nation, Ts'il Kaz Koh First Nation and Wet'suwet'en First Nation (i.e., the six First Nations) are in partnership with local governments as holders of Chinook Community Forest. Ts'il Kaz Koh First Nation and Wet'suwet'en First Nation are on the Board of Directors for Burns Lake Community Forest (K1A) and Cheslatta Carrier Nation holds Cheslatta Community Forest (K1M). In addition, Cheslatta Carrier Nation holds a replaceable forest licence; Wet'suwet'en First Nation holds a woodlot licence; and Lake Babine Nation and Nee Tahí Buhn hold First Nations woodland licences and woodlots. The Province has offered a replaceable forest licence to Ts'il Kaz Koh and as discussed above under '*area-based tenures*', the issuance of a First Nations woodland licence to Skin Tyee Nation and Wet'suwet'en First Nation is pending the completion of consultation. In addition, the Province has offered a total of 100 000 cubic metres as an attrition licence from unused volume to the six First Nations.

A land transfer agreement has been made between Cheslatta Carrier Nation and the Province as reconciliation for the flooding of the Nechako Reservoir. Reconciliation discussions are also underway with Lake Babine Nation.

Ts'il Kaz Koh and Cheslatta Carrier Nation have expressed interest further tenure opportunities within their traditional territory. I acknowledge that First Nations are interested in opportunities to take an active role in the forest industry however, it is not within the scope of my AAC determination to make tenure decisions regarding the apportionment of the AAC. If decisions are made that result in land being removed from the THLB then the AAC will be adjusted accordingly.

Aboriginal Peoples of Canada have distinct, constitutionally protected rights. The Crown has a duty to consult with and accommodate, as necessary, those First Nations for whom it has knowledge of the potential existence of Aboriginal Interest or treaty rights that may be impacted by a proposed decision, including

strategic-level decisions such as AAC determinations. In particular, recent court decisions have stated that decision makers must use credible information to consider the effects of land management decisions, including AAC determinations, on Aboriginal Interests or treaty rights. As chief forester, I must therefore consider information arising from the engagement process with First Nations respecting Aboriginal Interests and treaty rights that may be affected by my determination. As well, I will consider other relevant information available to the provincial government regarding Aboriginal Interests and treaty rights, including information gathered during other consultation processes.

The provincial government is committed to working collaboratively and respectfully with Indigenous leaders to establish a clear, cross-government vision of reconciliation to guide the implementation of the principles of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). As of the time of the chief forester's AAC decision for the Lakes TSA, there were no changes to legislation or policy modifying the statutory authority of the chief forester regarding AAC determinations. However, in agreement with the recently released Bill 41, *Declaration on the Rights of Indigenous Peoples Act*, the provincial government is committed to the preparation and implementation of an action plan, in consultation and cooperation with Indigenous Peoples, that aligns the proposed Declaration with current legislation. This includes annual progress reporting on goals achieved in the action plan. When the Province provides clear direction through legislation, policy, and/or communications on social and economic objectives relative to UNDRIP, the chief forester will incorporate those changes in subsequent AAC decisions.

As a strategic statutory decision, an AAC determination does not determine particular harvesting areas or patterns, and as a result do not relate directly to the manner in which timber is utilized or managed on the ground. The relationship to claims of Aboriginal title is not a direct one. AAC determinations consider the sustainable harvest level from a geographic area which may include lands claimed as Aboriginal title lands but not yet declared by a court to be such. While under claim, such lands remain Crown lands and are considered to be part of the harvestable land base. Whether timber is ultimately harvested from those lands is an issue that is subject to allocation decisions, and the AAC determination does not determine that matter.

Aboriginal Interests or treaty rights may be connected to biophysical, spatial, social, cultural, spiritual or experiential values. The overall AAC can affect various resource values and therefore the ability of Aboriginal Peoples to meaningfully exercise their Aboriginal rights. Information gained through consultation with potentially affected First Nations about Aboriginal rights claims has been considered in the development of this determination. Where the Province and First Nations have negotiated a treaty or have contractually agreed to a process for consultation, that process was followed.

The Province, through the Ministry of Indigenous Relations and Reconciliation (MIRR), continues to work with First Nations to develop agreements including tenure opportunities related to forestry. These agreements include but are not limited to, Reconciliation Agreements and Strategic Engagement Agreements (SEAs), Forest Consultation and Revenue Sharing Agreements (FCRSA), as well as other treaty related agreements.

There are thirteen First Nations whose traditional territories overlap the Lakes TSA: the Cheslatta Carrier Nation, Nee Tahi Buhn Band, Skin Tyee Nation, Wet'suwet'en First Nation, Ts'il Kaz Koh First Nation, Lake Babine Nation, Office of the Wet'suwet'en Hereditary Chiefs, Stellat'en First Nation, Nadleh Whut'en Band, Takla Lake First Nation, Ulkatcho First Nation, Tl'azt'en First Nation and Yekooche First Nation. Agreements that guided the consultation process timelines for the Lakes TSA include:

- Forest Consultation and Revenue Sharing Agreements (FCRSA) for Cheslatta Carrier Nation, Nee Tahi Buhn Band, Skin Tyee Nation, Wet'suwet'en First Nation, Ulkatcho First Nation, and Yekooche First Nation; and,
- Lake Babine Interim Forest Agreement (IFA).

Consultation followed the *Updated Procedures When Consulting with First Nations* for all First Nations.

Overall, the consultation process with First Nations included:

- March 2017: The Province initiated a pre-engagement process with First Nations for the Lakes TSA Timber Supply Review;

- June 2018: The Province sent the *Timber Supply Review Data Package* to First Nations for review and comments;
- April 2019: The Province sent the *Timber Supply Review Discussion Paper* and *Discussion Paper Summary* to First Nations for review and comments;
- The Province offered to meet with First Nations about the Lakes Timber Supply Review, and meetings were held where First Nations agreed to meet;
- The Province sent invitations to First nations, the public, licensees and stakeholders, regarding information meetings and an open house. These were attended by First Nations members.

On October 3, 2017 staff from the Nadina Natural Resource District attended a meeting with Stellat'en First Nation to discuss the upcoming data package and present an overview of, and answer questions regarding, the TSR process.

On November 8, 2017, Ts'il Kaz Koh First Nation, Stellat'en First Nation and Nadleh Whut'en Band requested a collaborative process, including capacity funding, similar to the approach held with the Carrier Sekani First Nations (which includes these First Nations) during the Prince George TSR. The Province responded on April 10, 2018, and confirmed interest in exploring a potential approach to collaboration with all thirteen First Nations that would build on the experience gained and analysis tools built during the Prince George TSR.

Following the release of the data package, district staff met with the following First Nations:

- Lake Babine Nation: the data package and an overview of the TSR were presented by district staff to Lake Babine Nation (July 12, 2018). Lake Babine Nation expressed concerns regarding wildlife and wildlife habitat. These concerns were addressed during the discussion. District staff also clarified their TSR-related questions.
- Cheslatta Carrier Nation: concerns were expressed regarding wildfires and genetic worth assumptions (September 13, 2018). Following this meeting, district staff forwarded wildfire information to Cheslatta Carrier Nation and revised genetic worth assumptions.
- Stellat'en First Nation: the data package and an overview of the TSR were presented by district staff to Stellat'en First Nation (September 21, 2018). Stellat'en First Nation expressed concerns regarding wildlife and wildlife habitat. These concerns were addressed during the discussion. District staff also clarified their TSR-related questions.
- Cheslatta Carrier Nation: on January 18, 2019, a TSR update meeting was held. Cheslatta Carrier Nation stated their desire for more area-based tenures and partnership over their traditional territory.
- Nee Tahi Buhn Band, Wet'suwet'en First Nation and Tl'azt'en First Nation: TSR update meetings were held in February 2019. General concerns regarding moose habitat and biodiversity were expressed by Tl'azt'en First Nation which were addressed during the discussion.

On November 16, 2018, the Carrier Sekani First Nations requested in-depth modelling to understand the potential effect of various future rates of harvest on their Aboriginal rights, title and interests. The Province responded on April 25, 2019, and informed that the TSA was not a good candidate for the analyses requested due to the fragmented nature of the THLB as a result of the creation of multiple area-based tenures.

During the open house meeting held on May 1, 2019, I spoke with several First Nation members and heard their concerns regarding the potential impact of an AAC reduction on their jobs and communities. On May 2, 2019, I met with Stellat'en First Nation, Lake Babine Nation, Cheslatta Carrier Nation, Nee Tahi Buhn Band and the Wet'suwet'en First Nation. Their concerns expressed at these meetings included: potential socio-economic impacts of a reduced AAC, cumulative effects, and potential impacts to moose and bear populations, traplines, biodiversity and wildlife habitat from harvesting and road development. I also

heard their expressed interests in further forest tenure opportunities in the Lakes TSA, and that my AAC determination needs to consider potential implications to future generations.

Specific concerns expressed by individual First Nations are addressed under the applicable factors in this rationale and in my determination. In summary, they included:

- *Minimum harvest age and volume* – Cheslatta Carrier Nation believes the inclusion of stands with low volume would be positive for timber supply.
- *Climate change* – a Ts'il Kaz Koh member expressed concerns about the impact of future fires on the AAC.
- *First Nations land and timber interests* – Ts'il Kaz Koh and Cheslatta Carrier Nation expressed interest in obtaining further tenure opportunities within their traditional territory.
- *Partition options and implications* – Cheslatta Carrier Nation believes AAC partitions should be established to ensure focus on burnt and beetle-killed timber and to set the stage for the creation of specific tenures.
- *Dead volume from fire-impacted stands* – Cheslatta Carrier Nation commented that to reduce fire hazards, harvesting should not be restricted in special management areas (e.g., OGMAs, caribou zones) and one member of the Ts'il Kaz Koh Nation is concerned about the impact of the 2018 fires on the base case, particularly in the context of salvage opportunities.

Concerns regarding the impacts to the land base from timber harvesting and road development have been addressed under the factors: '*estimates for roads, trails and landings*', '*riparian management*', '*volume exclusion for the deciduous component of coniferous-leading stands*', '*wildlife – general*', '*cumulative effects*', and '*climate change*'.

Ministry staff note that all consultations were carried out consistent with signed agreements between a First Nation and the Province. Where a signed agreement was not in place, the Ministry carried out the consultations consistent with the *Updated Procedures for Meeting Legal Obligations when Consulting with First Nations* that were prepared by the Province.

I have reviewed the information regarding the consultations undertaken with First Nations and discussed it in detail with Ministry staff. I am satisfied First Nations engagement was conducted appropriately and all reasonable efforts were made by Ministry staff to engage and inform First Nations (with interests within the Lakes TSA), to collect information regarding their Aboriginal Interests, and to understand how these Aboriginal Interests may be affected by this determination. I have considered the information received from First Nations and, where appropriate, I have addressed these concerns in my decision under the various factors described in this rationale document.

While I am of the view that the issues and concerns raised have been appropriately addressed, given the information available at this time, if new information regarding First Nations' Aboriginal Interests and treaty rights 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. This includes any outcomes from the provincial government's implementation of UNDRIP.

#### *- summary of public engagement*

Public engagement began in the months leading to the release of the *Lakes TSA Timber Supply Review Data Package* when several information meetings were held with local government officials. As a result of these meetings, the data package includes detailed maps and data summaries. The data package was released for public review on June 12, 2018.

Following the release of the data package, TSR presentation and information meetings were held with forest industry representatives and local governments. Further engagement sessions were facilitated by a consultant, following the conclusion of the public review period, that included forest industry representatives and local governments to provide regular updates and answer questions regarding the

process. In addition, a public open house meeting, which I attended, was held on May 1, 2019. Further to this, on July 9, 2019, I accompanied forest industry representatives on a field tour of the Lakes TSA.

The input received led to updates to the data package, additional sensitivity analyses to gain insight into potential opportunities for increasing timber supply, and the completion of a socio-economic analysis that included information provided by the Village of Burns Lake. In addition, the input received was directly considered in my determination, as reflected in various sections of this document and a comprehensive summary in Appendix 1 of the *Lakes TSA Timber Supply Analysis Discussion Paper*.

I am grateful to all public members, local government officials, and industry representatives who took the time to write to express their views and/or attend meetings. This input is meaningful and brings essential value to my determination as it allows me to understand the implication of changes in the timber supply to the local area. From the public input, I am cognizant the villages of Burns Lake and Fraser Lake, and surrounding communities, are very dependent on the forest industry both for direct employment and also for additional employment and economic benefits from the production and purchase of related goods and services. I am also cognizant residents value the long-term health and sustainability of all forest values.

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

#### Abnormal infestations, devastations, and salvage programs

##### *- dead volume from fire-impacted stands*

Forest fires are an integral part of the ecosystems of the Lakes TSA and stand replacing fires are frequent. Fires provide nutrient cycling, complexity, resiliency, and biological legacies within the ecosystem. Some species, like lodgepole pine, are well suited to prompt re-establishment after fire.

For the most part of the last century, an area of about 400 hectares was burned annually. In the past decade, this average increased to approximately 42 000 hectares per year. In 2018, eight large wildfires burned a total of 209 000 hectares within the geographic boundary of the Lakes TSA.

In the Lakes TSA the vegetation resource inventory that supports the analysis reflects the species, height, age and volume of trees that were alive as of 2012. This inventory is updated annually to account for tree growth and captures the impact of past disturbances, including fires. The volume projected to be lost to fire and not salvaged (i.e., unsalvaged loss) was accounted for by averaging the recorded volume losses for the 1999 to 2017 period. This volume was estimated to be 59 741 cubic metres per year.

For the 2018 fires, District staff expressed concerns that the base case has underestimated the amount of volume that could be salvaged in the short term. Fire-killed or damaged volume is assumed to be available for salvage for up to five years and it is estimated that up to 1.5 million cubic metres of damaged volume is available for salvage. This volume is from the low- and medium-burn severity classes. About half of this volume is located in the perimeter of the Verdun Mountain fire, followed by the Shovel Lake and Chelaslie Arm fires.

Input received from licensees shows a desire to understand how fire impacts are incorporated into the base case projection for the Lakes TSA. This desire is shared by one Ts'il Kaz Koh First Nation member, particularly in the context of salvage opportunities. Cheslatta Carrier Nation commented that to reduce fire hazards, harvesting should not be restricted in special management areas (e.g., OGMAs, caribou zones). This comment was echoed by one resident while another resident commented that harvest levels should be elevated to remove fuels and reduce the wildfire hazard. Conversely, another resident commented that potential wildfire hazards should not be used to justify harvest in the last remaining spruce stands.

After reviewing the information provided to me, including public input, I conclude the base case projection underestimates the amount of dead volume available in the short term as a result of the 2018 wildfires. Due to the distribution of burn severity classes within a burn, the contribution of surviving trees to the live volume harvest level projected in the base case, and the short-term shelf life of burned timber, only a portion of the dead volume potentially available can be realistically salvaged from stands in the low- and medium-burn severity. I am accounting for a 150 000 cubic metres per year underestimation of dead

volume resulting from the 2018 fires in the short term and I discuss this further in my '**Reasons for Decision**'.

I note detailed information about modelling assumptions for the 2018 fires are captured in the *Lakes TSA Timber Supply Analysis Discussion Paper*. I acknowledge the increased fire activities of the past decade and climate change projections that are conducive to increasing fire frequency, severity, and season length. I also acknowledge the importance of community wildfire protection to residents. With this in mind, I caution that a balanced approach that considers human safety and the long-term provision of ecosystem values should be considered over the short-term economic gain obtained from harvesting. Forest fire management planning should focus on what to retain, rather than on what to harvest.

## **Reasons for Decision**

For this determination, I am especially cognizant of the high level of public engagement, and gratefully acknowledge the collaborative effort and planning that contributed to a successful field tour. Following the comprehensive public review, I have heard the many comments and concerns expressed by First Nations, licensees, stakeholders and numerous members of the community.

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

I note that the base case harvest forecast showed an initial harvest level of 400 000 cubic metres of live volume was possible for the first 60 years. While harvesting this live volume, an additional 400 000 cubic metres of dead volume could be salvaged for 10 years. This dead volume is from stands severely affected by the mountain pine beetle. Managed stands are projected to provide almost the entire harvest after 60 years from now and are able to support a stable long-term harvest level of 900 000 cubic metres per year.

I am satisfied that the assumptions applied in the base case forecast for the majority of the factors applicable to the Lakes TSA were appropriate, as detailed in Table 1 or as described elsewhere in this rationale. However, I have identified factors which, considered separately, indicate that the timber supply may be either greater or less than 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 readily quantified at this time.

I have identified one factor in my considerations as indicating that the timber supply projected in the base case may have been overestimated, to a degree that can be quantified:

- *Non-provincial land* – the base case did not account for Crown land that will be transferred as fee simple land as part of a Settlement Agreement signed between the Province and the Cheslatta Carrier Nation. This resulted in a 1.6 percent overestimation of timber supply in the short term and a 2.9 percent overestimation in the long term.

I have also identified the following factors in my considerations as indicating that the timber supply projected in the base case may have been underestimated, to a degree that can be quantified:

- *Area-based tenures* – the base case incorrectly excluded the Skin Tyee and Wet'suwet'en First Nation woodland licences from the timber harvesting land base. This resulted in a two percent underestimation of timber supply.
- *Deciduous component of coniferous-leading stands* – inclusion of the deciduous component of coniferous-leading stands represents a five percent underestimate in the short term and up to one percent underestimation in the long-term base case timber supply.
- *Interior log grade change* - stand yield information used in the base case did not account for the contribution of dead potential volume; after accounting for dead potential volume included in the base case, this resulted in an underestimation in timber supply of up to three percent.
- *Dead volume from fire-impacted stands* – dead volume from fire-impacted stands resulted in a 150 000 cubic metres per year underestimate in the base case timber supply.

In considering the above-mentioned influences, I find that the combined effect of accounting for non-provincial land, area-based tenures, and log grade change represents a net underestimation of approximately three percent.

Although the feasibility of harvesting the deciduous component of coniferous stands is uncertain, I recognize the potential demand from Asian markets for pellets as a clean energy source and the comments received from industry regarding the consideration of including deciduous-leading stands in the timber harvesting land base and a partition to encourage their use. The results of the sensitivity analysis that included the deciduous component of coniferous-leading stands also demonstrated an opportunity to mitigate forecast reductions in the base case timber supply. I will therefore make an upward adjustment of five percent to account for the deciduous component (by-catch) of coniferous-leading stands, using a partitioned volume of 20 000 cubic metres.

The dead component of the volume harvested is comprised of beetle-killed stands and stands burned by fire (in the low- and medium-burn severity classes). As a result of my observations on the field tour, and in line with district recommendations, I recognize the potential salvage opportunities that still exist in fire-burned stands and will therefore make an additional 150 000 cubic metres upward adjustment to the base case timber supply in support of the underestimate in the volume impacted by wildfire in the medium- and low-burn severity classes.

As mentioned previously in this rationale, the ability of the licensees to maintain a sustainable harvest level of live coniferous volume is dependent on their ability to shift their harvesting priorities to live, low volume stands, so that management practices are consistent with the base case forecast assumptions. The live volume harvest level of 400 000 cubic metres per year indicated in the base case can only be realized if licensees immediately focus their performance in low live volume stands. Although I am not implementing a low volume partition at this time, this AAC decision is predicated on licensee performance in low volume stands. Failure to do so puts the sustainability of the timber supply in the Lakes TSA at risk.

It is my expectation that district staff will work with licensees and BCTS to monitor and assess harvest performance within the partitions and report back to me if adjustments are necessary in the next AAC determination.

## **Determination**

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the Lakes TSA by establishing an AAC of 970 000 cubic metres.

This AAC is partitioned as follows:

- *Live coniferous volume:* A maximum of 400 000 cubic metres per year is attributable to live conifer volume;
- *Live deciduous volume:* A maximum of 20 000 cubic metres is attributable to live deciduous volume;
- *Dead volume:* A maximum of 550 000 cubic metres is attributable to dead volume.

This determination becomes effective on November 21, 2019 and will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination.

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

## Implementation

In the period following this decision and leading to the subsequent determination, I encourage Ministry staff, other agencies and licensees (as appropriate) to undertake or support the tasks noted below, the particular benefits of which are described in greater detail in appropriate sections of the rationale document.

I recognize that the ability of staff and licensees to undertake projects is dependent on available resources, including funding. However, the following projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Lakes TSA.

1. *Riparian management* – I expect licensees to work with district staff on a comprehensive stream classification to be included in the next TSR.
2. *Minimum harvest age and volume* – this AAC decision is predicated on licensee performance in low volume stands. Failure to do so puts the sustainability of the timber supply in the Lakes TSA at risk. I expect licensees and BCTS to work with Ministry staff to carefully plan and monitor harvest performance with regards to performance in low volume stands and report back to me annually. I will evaluate the harvest performance and if necessary, make an adjustment to the AAC in the next AAC determination.
3. *Landscape-level biodiversity* – I expect Ministry staff to work with licensees to develop and implement a strategy for the recruitment and management of mature and old seral targets. I expect this strategy to be reflected in approved FSP and incorporated as part of the cutting permit application process.
4. *Wildlife habitat areas* – I expect Ministry staff to complete a comprehensive regional wildlife assessment to evaluate the conditions and distribution of identified species and the effectiveness of current management tools in maintaining and recovering habitats.
5. *Hydrological considerations* – I expect Ministry research staff to complete a comprehensive watershed assessment for the Lakes TSA for incorporation into the next timber supply review.
6. *Cumulative effects* – I expect Ministry staff to inventory existing roads according to the risk to forest values and prepare management guidelines that manage the risk to aquatic ecosystems and grizzly bear and, where possible, report on the size and health of the grizzly bear population.
7. *Climate change mitigation* – I expect Ministry staff to work with licensees to implement mitigations options that would lessen the impact of climate change to timber supply while protecting other values and promoting forest regeneration suitable for future climates.
8. *Climate change and forest health monitoring* – I expect Ministry research staff to enhance climate and forest health monitoring within the Lakes TSA to decrease uncertainty and improve model projections.
9. *Climate change modelling* – I expect FAIB staff to work on integrating climate change projections into timber supply, growth and yield, and natural disturbance models to better inform future AAC determinations.



Diane Nicholls, RPF  
Chief Forester



November 21, 2019

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

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to October 30, 2019), 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 respect of an allowable annual cut determined under subsection (1), the chief forester may, at any time, 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.]
- (5.1) The chief forester may, at any time, amend or cancel a specification made under subsection (5).
- (6) The minister must determine an allowable annual cut for each woodlot licence area in accordance with the woodlot licence for that area.
- (7) The minister must determine an allowable annual cut for
- (a) each community forest agreement area in accordance with the community forest agreement for that area, and
  - (b) each first nations woodland licence area in accordance with the first nations woodland licence for that area.
- (8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider
- (a) the rate of timber production that may be sustained on the area, taking into account
    - (i) the composition of the forest and its expected rate of growth on the area,
    - (ii) the expected time that it will take the forest to become re-established on the area following denudation,
    - (iii) silviculture treatments to be applied to the area,
    - (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,
    - (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and
    - (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,
  - (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,
  - (c) [Repealed 2003-31-2.]
  - (d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and
  - (e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.
- (9) Subsections (1) to (4) of this section do not apply in respect of the management area, as defined in section 1 (1) of the [Haida Gwaii Reconciliation Act](#).
- (10) Within one year after the chief forester receives notice under section 5 (4) (a) of the [Haida Gwaii Reconciliation Act](#), the chief forester must determine, in accordance with this section, the allowable annual cut for
- (a) the Crown land in each timber supply area, except the areas excluded under subsection (1) (a) of this section, and
  - (b) each tree farm licence area
- in the management area, as defined in section 1 (1) of the [Haida Gwaii Reconciliation Act](#).

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

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

Section 4 of the *Ministry of Forests and Range Act* (current to October 30, 2019) reads as follows:

### **Purposes and functions of Ministry**

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

- (a) encourage maximum productivity of the forest and range resources in British Columbia;
- (b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;
- (c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;
- (d) encourage a vigorous, efficient and world competitive
  - (i) timber processing industry, and
  - (ii) ranching sectorin British Columbia;
- (e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

### Appendix 3: Minister's letter of October 30, 2017



Reference: 230810

October 30, 2017

Diane Nicholls, Chief Forester and Assistant Deputy Minister  
Ministry of Forests, Lands, Natural Resource Operations  
and Rural Development  
Victoria, British Columbia  
V8W 2H1

*Dear Diane*

The British Columbia *Forest Act* conveys the responsibility to determine an Allowable Annual Cut (AAC) to the Chief Forester of the Province of BC for each timber supply area and tree farm licence in the province. It also specifies considerations that must be brought to bear during the course of such determinations including, among others, the economic and social objectives of the government.

This letter is intended to provide you with guidance regarding the objectives of the British Columbia (BC) government that require your consideration when determining an AAC.

Your office implements a rigorous Timber Supply Review Process to help ensure that each AAC you determine responds to a broad array of objectives and aligns with land use and management decisions established by provincial statutes and regulations. The objectives identified below are to be considered and as part of the review process to ensure that AAC determinations, and the timber harvest rates they enable, continue to support government goals.

This letter replaces two letters previously issued by the Minister of Forests and Range to the chief forester, dated July 4, 2006 and October 27, 2010. It is intended to be used in concert with direction provided by the Minister of Forests, Lands and Natural Resource Operations to the chief forester in a letter dated April 12, 2013, concerning objectives outlined in the Shared Decision Making Process pursuant to the Nanwakolas Reconciliation Protocol.

The BC government has committed to building a strong, sustainable, innovative economy and creating well paid jobs in the province. The health of the forest sector, and its ability to respond to an array of short and long term social, economic and environmental interests, is a key to delivering on this commitment. As such, Government has identified specific objectives for the management of BC's forests and Crown lands. Those relevant to AAC determinations include:

Page 1 of 3

Ministry of Forests, Lands,  
Natural Resource Operations  
and Rural Development

Office of the Minister

Mailing Address:  
PO BOX 9049 Stn Prov Govt  
Victoria, BC V8W 9E2

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Fax: (250) 387-1040  
Website: [www.gov.bc.ca/for](http://www.gov.bc.ca/for)

Diane Nicholls, Chief Forester and Assistant Deputy Minister

- modernizing land-use planning to effectively and sustainably manage BC's ecosystems, rivers, lakes, watersheds, forests and old growth forests
- expanding investments in reforestation; and
- collaborating to develop strategies to manage wildlife resources and habitat

Strategies for delivering on these objectives will be developed in collaboration with the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, relevant Natural Resource Ministries, indigenous partners and industry. Once approved by government, I ask that you ensure such strategies are integrated into the Timber Supply Review Process to support AAC determinations.

The BC government has committed to full and lasting reconciliation with Indigenous peoples. As chief forester, your responsibility includes continuing to ensure that AAC determinations take into consideration relevant agreements between First Nations and the Government of BC, court decisions that define Aboriginal title and rights as well as moving forward on reviewing policies, programs, and legislation to determine how to bring the principles of the United Nations Declaration on the Rights of Indigenous Peoples into action for AAC determinations. You also have a responsibility to continue to carefully consider traditional knowledge and other input from BC First Nation communities and organizations in the course of AAC determinations as they pertain to the AAC determination.

The *Forest Act* requires that the chief forester consider a range of forest health issues as part of AAC determinations, including the impacts of circumstances such as infestations, devastations and salvage programs. This is particularly relevant as BC's forest sector emerges from a period of significant, compounding challenges. The infestation of the Mountain Pine Beetle that peaked in the late 2000s has largely subsided but with continuing effects to the size and composition of the forest inventory. Currently, the north area is experiencing Spruce Beetle infestations which also pose impacts. Recently, the Province has experienced record levels of wildfires that have impacted timber supply, community stability and multiple forest values.

In response to these challenges, it is a government objective to focus on planning and sustainable resource management in a way that supports robust forest recovery and timely and effective responses to emerging threats. Please consider how your AAC determinations can support these objectives while promoting forest health and values. In some cases AAC determinations may encourage management practices that avert another infestation in the province's forests. In certain regions, they will need to reflect the reality of a lower timber supply. Some regions will require expanded investment in reforestation and/or an increased focus on timber utilization and recovery. In the wake of extensive natural disasters, the extent of damage in certain areas may also warrant re-determining AACs earlier than scheduled.

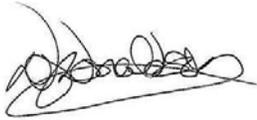
In order to ensure that AAC determinations align with government objectives to modernize land-use planning and sustainably manage B.C.'s ecosystems, rivers, lakes, watersheds, forests and old growth forests, the Timber Supply Review process should incorporate the best available information on climate change and the cumulative effects of multiple activities on the land base. Management options that align with established climate change strategies, adaptation and mitigation practices should be explored. Where the cumulative effects of timber harvesting and other land based activities indicate a risk to natural resource values, the process should identify those risks for consideration in land-use planning.

Diane Nicholls, Chief Forester and Assistant Deputy Minister

This government recognises that the forest sector is of critical importance to BC. The needs of rural communities and forest based industries are evolving in response to a number of the factors mentioned above. To support BC's forest-dependent communities, I ask that your AAC determinations consider the environmental, social and economic needs of local communities as expressed by the public during Timber Supply Review processes, including strategies that contribute to community economic stability, and the jobs that the forest sector creates in communities, where these are consistent with the government's broader objectives. I also ask that when faced with necessary reductions in AAC's, that those reductions be no larger than necessary to avoid significant longer term impacts.

Thank you Diane, for your continued service and considerable efforts in these regards.

Sincerely,

A handwritten signature in black ink, appearing to read 'Doug Donaldson', written over a horizontal line.

Doug Donaldson  
Minister

## Appendix 4: Information sources used in the AAC determination

The information considered in determining the AAC for the Lakes TSA includes the following:

### Legislation

- Province of British Columbia. RSBC 1996. *Forest Practices Code of British Columbia Act*. Victoria, BC. Current to October 30, 2019. [www.bclaws.ca/civix/document/id/complete/statreg/96159\\_01](http://www.bclaws.ca/civix/document/id/complete/statreg/96159_01). (Accessed October 30, 2019).
- Province of British Columbia. RSBC 1996. *Heritage Conservation Act*. Victoria, BC. Current to October 30, 2019. [www.bclaws.ca/civix/document/id/complete/statreg/96187\\_01](http://www.bclaws.ca/civix/document/id/complete/statreg/96187_01). (Accessed October 30, 2019).
- Province of British Columbia. RSBC 1996. *Land Act*. Current to October 30, 2019. [http://www.bclaws.ca/civix/document/id/complete/statreg/96245\\_01](http://www.bclaws.ca/civix/document/id/complete/statreg/96245_01). (Accessed October 30, 2019).
- Province of British Columbia. 2004. *Forest and Range Practices Act*. Victoria, BC. Current to November 12, 2019. [http://www.bclaws.ca/civix/document/id/complete/statreg/14\\_2004](http://www.bclaws.ca/civix/document/id/complete/statreg/14_2004). (Accessed November 12, 2019).
- Province of British Columbia. 2004. *Forest and Range Practices Act Forest Planning and Practices Regulation*. Victoria, BC. Current to November 12, 2019. [http://www.bclaws.ca/civix/document/id/complete/statreg/14\\_2004](http://www.bclaws.ca/civix/document/id/complete/statreg/14_2004). (Accessed November 12, 2019).
- Province of British Columbia. 2004. *Forest and Range Practices Act Government Actions Regulation*. Victoria, BC. Consolidated to November 12, 2019. [http://www.bclaws.ca/civix/document/id/complete/statreg/582\\_2004](http://www.bclaws.ca/civix/document/id/complete/statreg/582_2004). (Accessed November 12, 2019).

### Timber Supply Review Documents

- B.C. Ministry of Forests, Lands, Natural Resource Operations & Rural Development. 2018. Lakes timber supply area timber supply review data package. For. Anal. Inven. Br. Victoria, B.C. [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/lakes\\_tsa\\_data\\_package\\_2018.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/lakes_tsa_data_package_2018.pdf). (Accessed August 14, 2019).
- B.C. Ministry of Forests, Lands, Natural Resource Operations & Rural Development. 2019. Lakes timber supply area timber supply review data package. For. Anal. Inven. Br. Victoria, B.C. [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/14tsdp\\_update\\_apr2019.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/14tsdp_update_apr2019.pdf). (Accessed August 14, 2019).
- B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development. 2019. Lakes timber supply area timber supply analysis public discussion paper. For. Anal. Inven. Br. Victoria, B.C. [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/14ts\\_tsr\\_dp\\_2019.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/14ts_tsr_dp_2019.pdf). (Accessed August 14, 2019).

### First Nations

- Province of British Columbia. 2010. Updated Procedures When Consulting with First Nations. Victoria, BC. <https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/legal-obligations-when-consulting-with-first-nations.pdf>. (Accessed September 18, 2019).
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## Land Use

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