BRITISH COLUMBIA

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

Cascadia Timber Supply Area

Rationale for Allowable Annual Cut (AAC) Determination

Effective January 23, 2020

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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* for the Cascadia 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 Selkirk, Quesnel and Coast Mountains Natural Resource District offices, BC Timber Sales (BCTS), and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to local residents, First Nations, and stakeholders who contributed to this process.

Statutory framework

Section 8 of the *Forest Act* requires the Chief Forester to consider a number of specified factors in determining AACs for Timber Supply Areas (TSAs) and TFLs. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document.

Description of the Cascadia Timber Supply Area

The Cascadia TSA consists of 11 timber supply blocks ("blocks") in the interior of British Columbia, each block ranging in size from 2000 hectares to 83 000 hectares. Occupying a total area of 316 630 hectares, the Cascadia TSA overlaps three of the Ministry's Natural Resource Districts: Selkirk (DSE), Quesnel (DQU) and Coast Mountains (DKM).

BC Timber Sales (BCTS) is the sole operator in the Cascadia TSA, holding 100 percent of the AAC, which is sold through competitive auction programs managed by four BCTS business areas: the Kootenay Business Area (TKO), the Okanagan-Columbia Business Area (TOC), the Cariboo-Chilcotin Business Area (TCC), and the Skeena Business (TSK). Annual harvest volume targets are currently established by each business area and field team. These teams operate out of offices in Nelson and Castlegar (TKO), Vernon and Revelstoke (TOC), Williams Lake and Quesnel (TCC), and Terrace and Hazelton (TSK).

The Cascadia TSA is widely dispersed over BC, in three distinct geographic regions. Blocks 1 – 3 (TKO) and block 4 (TOC) are in the West Kootenay, in the wet interior. Biogeoclimatic (BEC) variants in this region are Interior Cedar Hemlock (ICH) and Englemann Spruce/Subalpine fir (ESSF). Blocks 5 – 8 (TCC) are in the Cariboo-Chilcotin, in the interior plateau. BEC variants in this region are Sub-boreal Spruce (SBS) and ESSF. Blocks 9 - 11 (TSK) are more coastal, occurring in the transition zone between the Coast Mountains and the interior. BEC variants in this region are Coastal Western Hemlock (CWH) and Mountain Hemlock (MH). The biogeoclimatic diversity of the TSA provides for a wide range of fish and wildlife habitat.

At the TSA level, the Crown forest land base (CFLB) is dominated by western hemlock, various balsam fir species, spruce and some Douglas-fir. Hemlock/balsam-leading stands, spruce-leading stands and Douglas-fir leading stands constitute 58 percent, 22 percent and 10 percent of the CFLB, respectively. Stand species composition varies significantly between the business areas. In the TKO, the dominant species are sub-alpine fir and spruce with some hemlock and Douglas-fir. The distribution is similar in the TOC, where there is a higher proportion of spruce. In TCC, stands are predominantly spruce-leading and there is no hemlock or cedar. In TSK, hemlock is the dominant species, with some balsam and there is no Douglas-fir.

Resource management in the Cascadia TSA is subject to several land use plans, including the Kootenay-Boundary Higher Level Plan, the Revelstoke Higher Level Plan, the Cariboo-Chilcotin Land Use Plan and the Kalum Sustainable Resource Management Plan. Forest management objectives outside of the plan areas

are provided by the Forest Planning and Practices Regulation under the *Forest and Range Practices Act*, as well as other legislation.

Larger centres associated with the Cascadia TSA include Nelson, Castlegar, Nakusp, Vernon, Revelstoke, Williams Lake, Quesnel, Terrace and Hazelton. Twenty-four First Nations have traditional territory that overlaps at least one of the Cascadia TSA timber supply blocks.

History of the Cascadia TSA

The Cascadia TSA was established on July 16, 2011, from an amalgamation of areas removed from TFLs 23, 52, 41 and 1, as well as areas transferred from the Revelstoke and Arrow TSAs. The TFL areas were taken back by the Province through the *Forestry Revitalization Act* (Bill 28, 2003) to support the establishment of the provincial market pricing system for setting stumpage rates. The boundaries of the 11 blocks making up the TSA were determined through the Bill 28 process.

At its creation in 2011, the AAC for the Cascadia TSA was 402 818 cubic metres. This AAC was established by prorating the AAC of the contributing TFL and TSA areas by the proportion of timber harvesting land base that was transferred to the Cascadia TSA. Following the creation of the Wells-Barkerville Community Forest from a portion of block 6, the AAC was reduced by 5000 cubic metres to 397 818 cubic metres. The entire AAC is allocated to BCTS.

New AAC determination

Effective January 23, 2020, the new AAC for the Cascadia TSA is 356 230 cubic metres, partitioned as follows: 101 420 cubic metres attributable to the BCTS Kootenay Business Area; 63 000 cubic metres attributable to the BCTS Okanagan-Columbia Business Area; 65 740 cubic metres attributable to the BCTS Cariboo-Chilcotin Business Area; and 126 070 cubic metres attributable to the BCTS Skeena Business Area. The AAC will remain in effect until a new AAC is determined, which must take place within 10 years of this determination unless significant new information becomes available.

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 issues that must be considered when making decisions such as AAC determinations. Such information does provide valuable insight into potential impacts of different uncertainties about or changes to resource information and management practices, 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

Given the large number of periodic AAC determinations required for BC'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 *Forester's 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, title 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, these areas are deducted from the 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 ongoing plan implementation decisions.

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

I acknowledge the perspective that alternate strategies for dealing with information uncertainty 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). The *Declaration on the Rights of Indigenous Peoples Act* of 2019 ("DRIPA") commits the provincial government to aligning provincial laws with 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 established and 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. The UNDRIP is not legally binding in international law or in law in Canada or BC, and until laws and policies are formally amended as a result of the DRIPA process, as necessary, to align with the Declaration, I am bound by the existing laws of British Columbia.

Where First Nations and the Province are engaged in collaborative land and resource planning, the Province may make 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.

Where collaborative planning between First Nations and the Province is ongoing, there may be preliminary but not yet finalized and formalized land use zones or management objectives. As is the case for land use and management planning in general, 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*, and with consultation obligations defined in court decisions. 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.

The timber on established Aboriginal title lands (meaning Aboriginal title declared by a court or defined under an agreement with necessary federal and provincial implementation legislation), Treaty Settlement Lands or Indian Reserves, is no longer likely to be provincial Crown timber, depending on the particular circumstances. Consequently, if it is not provincial Crown timber, it does not contribute to the AAC of the timber supply area or tree farm licence overlapped by those lands. 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 could affect the AAC determination, given uncertainties about the scope, nature and geographic extent of title. Unless land has been established to be Aboriginal title land, Treaty Settlement Land or reserve 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 effect can also support considerations related to Aboriginal Interests.

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, amount, 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 forecasts provided to me through the work of the Timber Supply Review (TSR) program for TSAs and TFLs.

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

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

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

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

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

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

Base case for the Cascadia TSA

The timber supply analysis was prepared for BCTS by Forest Ecosystem Solutions Ltd. using their proprietary forest estate model, Forest Simulation and Optimization System.

The TSA was grouped into blocks according to business area. Blocks 1, 2 and 3 were grouped for the Kootenay Business Area (TKO); block 4 was grouped for the Okanagan-Columbia Business Area (TOC); blocks 5, 6, 7 and 8 were grouped for the Cariboo-Chilcotin Business Area (TCC); and blocks 9, 10, and 11 were grouped for the Skeena Business Area (TSK).

In order to account for the geographic dispersion of blocks in the Cascadia TSA, BCTS establishes individual annual harvest targets for each business area. Consequently, individual base case forecasts were prepared for each of the business areas. Each business area base case was projected following the land base assumptions, forest practices and stand growth rates that BCTS believes reflect current management in that business area. The timber supply available for each of the business areas was projected over a 250-year term (starting in 2016) using five-year periods. For TKO, TOC and TSK a highest-volume-first harvest rule was applied. A relative-oldest-first harvest rule was applied for TCC (see '*harvest rules and priority*').

The objective of each business area base case was to provide a harvest schedule that projects an orderly transition from the short-term harvest level to the highest possible even-flow harvest level, while meeting all non-timber objectives and following current management practices for each of the business areas within the Cascadia TSA. As well, incremental reductions in the harvest level during the transition from the short-term to the long-term parts of the forecasts were constrained to be no more than 10 percent of the harvest level in any one decade.

In the TKO base case, the initial harvest level of 101 420 cubic metres per year, which is about 10 percent lower than the AAC allocated to this business area (112 650 cubic metres), is maintained for two decades. Thereafter, the harvest level declines to 91 570 cubic metres per year at year 21, to 82 440 cubic metres per year at year 41 and to the mid-term harvest level of 76 000 cubic metres per year at year 61. The mid-term level is maintained for 135 years before increasing to the long-term harvest level of 78 470 cubic metres per year at year 196.

In the TOC base case, the initial harvest level of 59 345 cubic metres per year, which is about 11 percent lower than the AAC allocated to this business area (66 566 cubic metres), is maintained for 150 years before increasing to the long-term harvest level of 61 130 cubic metres per year.

In the TCC base case, the initial harvest level of 55 190 cubic metres per year, which is about 28 percent lower than the AAC allocated to this business area (76 986 cubic metres), is maintained for 170 years before increasing to the long-term harvest level 58 790 cubic metres per year.

In the TSK base case, the initial harvest level of 126 070 cubic metres per year, which is 11 percent lower than the AAC allocated to this business area (141 616 cubic metres), is maintained for 15 years before declining to the mid-term level of 113 770 cubic metres per year. The mid-term level is maintained for 15 years before increasing to the long-term harvest level of 102 830 cubic metres per year at year 31.

To assess the potential implications and risk to timber supply arising from uncertainty in data assumptions, various sensitivity analyses were prepared as part of the overall timber supply analysis. These sensitivity analyses and associated alternative harvest projections have also assisted me in considering the factors leading to my determination.

As discussed throughout this rationale, and in consideration of the items described above, I am satisfied that the business area base cases provide an adequate basis from which I can assess the timber supply for the Cascadia TSA in this determination.

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

I have reviewed the information for all of the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base cases 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 cases, no discussion is included in this rationale. These factors are listed in Table 1.

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

Table 1. List of factors accepted as modelled

***Forest Act* section and description**	**Factors accepted as modelled**
8(8)(a)(i) - the composition of the forest and its expected rate of growth on the area	• total area within the Cascadia TSA • non-forest, non-productive forest • existing and future roads and utility corridors • inoperable/inaccessible areas • non-merchantable forest types • wildllife habitat • riparian reserves and management zones • wildlife tree retention • water licence points of diversion • permanent sample plots • site productivity • stand aggregation • non-stocked areas
8(8)(a)(ii) - the expected time that it will take the forest to become re-established on the area following denudation	• stand establishment
8(8)(a)(iii) - silviculture treatments to be applied to the area	• silviculture systems
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	• decay, waste and breakage
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	• objectives for visual resources • objectives for cutblock adjacency and green-up • community and domestic watersheds • objectives for stand-level biodiversity • harvest rules and priority
8(8)(a)(vi) - any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber	• none

Forest Act **section and description**	**Factors accepted as modelled**
8(8)(b) – the short and long term implications to British Columbia of alternative rates of timber harvesting from the area	• none
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	• none
8(8)(e) - abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	• Abnormal infestations and salvage programs and unsalvaged losses

***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 timber harvesting

- *general comments*

The timber harvesting land base (THLB) is an estimate of the land where timber harvesting is considered both available and economically feasible, given the objectives for all relevant forest values, existing timber quality, market values and applicable technology. It is a strategic-level estimate 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.

The total area of the Cascadia TSA is approximately 316 630 hectares, of which 86 258 hectares are deemed to be available as THLB after deductions are applied for each of the factors noted in Table 1 above and in the factors discussed below. The total area of the TKO is 102 032 hectares, of which 25 903 hectares are THLB; the total area of the TOC is 73 517 hectares, of which 19 213 hectares are THLB; the total area of the TCC is 27 205 hectares of which 17 483 hectares are THLB; and the total area of the TSK is 113 876 hectares of which 23 660 hectares are THLB.

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

For this determination, I conclude that the approach used to determine the THLB for the Cascadia TSA and for each of the business areas was appropriate.

- *forest inventory*

The current forest inventory for the Cascadia TSA is a combination of a new Vegetation Resource Inventory (VRI) and non-standard TFL inventories. Each inventory was converted to VRI format by Forest Analysis and Inventory Branch (FAIB), updated for depletions and projected to 2016, prior to consolidation for the entire Cascadia TSA.

VRI data was not available for approximately 3900 hectares, most of which is in block 9 (TSK), an area that was transferred from TFL 41 to the Cascadia TSA. Most of the missing data covered areas classified as alpine, avalanche tracks, gullies, wetlands, previously harvested areas, or forest. Those areas deemed to be forest were assigned the attributes from nearby forest polygons. Stand depletions due to natural disturbance and harvesting were reviewed and BCTS provided corrections and information on missing cutblocks.

For this determination, I accept that the best available inventory information was used in the base cases. However, prior to the next determination it is my expectation that FAIB will work with BCTS to address the gaps in inventory information for block 9, as indicated under '**Implementation**'.

- *stands with low timber growing potential*

BCTS operational staff in each business area in the Cascadia TSA were consulted to determine the minimum volume per hectare of stands currently harvested using either cable- or ground-based harvesting systems. Stands that did not reach these minimum volume criteria by age 150 years were removed from the THLB.

For TKO, the minimum volume criteria for cable and ground harvesting were 200 cubic metres per hectare and 150 cubic metres per hectare, respectively. For TOC, the minimum volume criteria for cable and ground harvesting were 250 cubic metres per hectare and 200 cubic metres per hectare, respectively. For TCC, the minimum volume criteria for cable and ground harvesting were 200 cubic metres per hectare and 110 cubic metres per hectare, respectively. For TSK, the minimum volume criteria for both cable and ground harvesting were 250 cubic metres per hectare.

Using these criteria, a total area of 11 421 hectares were removed from the Cascadia TSA THLB to account for stands with low timber growing potential.

For this determination, I am prepared to accept that the best available information regarding stands with low timber growing potential was used in the business area base cases. However, I am concerned about the use of a minimum harvest criterion as low as 110 cubic metres per hectare in the TCC and will discuss this further in '*minimum harvest criteria*'.

- *unstable terrain*

In order to account for current practices in potentially unstable (Class IV) or unstable (Class V) terrain, a total area of 28 506 hectares was excluded from the Cascadia TSA THLB.

Terrain stability mapping (TSM) is available for most of the Cascadia TSA, including TKO, TOC, and TCC. In TSK, mapping is available for most of block 11 and for valley bottoms in block 9. Those areas in block 10 without TSM are managed under a system where all slopes greater than 60 percent are mapped and treated as Class IV terrain.

In TKO and TOC, 13 percent of Class IV terrain and 80 percent of Class V terrain were removed from the THLB. In TCC, 50 percent of Class IV terrain and 100 percent of Class V terrain were removed from the THLB.

In TSK, 10 percent of Class IV terrain (including slopes greater than 60 percent without TSM) and 100 percent of Class V terrain were removed from the THLB. All previously harvested Class IV terrain was included in the THLB. Class V terrain harvested after 1995 was also included in the THLB because these areas have been assessed by a professional engineer or professional geoscientist prior to harvesting and would likely be harvested again.

Class V areas harvested in 1995 or earlier were completely excluded from the THLB because they were assumed to have been harvested prior to the general availability of terrain stability mapping, which began in the 1990's. On this account, a total of 361 hectares were removed from the THLB. This area is distributed across all four business units and represents from 0.14 percent to one percent of the THLB in each business unit. BCTS staff believe excluding all Class V terrain harvested prior to 1995 is overly conservative due to the likelihood that some portion of this area may be eligible for harvesting again in the future.

I agree with BCTS staff that it is likely some portion of the Class V terrain harvested prior to 1995 will be harvested again. However, given the magnitude of the THLB underestimation, this factor has a negligible, if any, effect on the business area base cases and requires no further consideration in this determination.

- *recreation areas*

The recreational use of the Cascadia TSA includes the use of hiking, biking and skiing trails, and lakeshore and mountain camping areas. Recreation data for the Cascadia TSA include Recreation Sites and Trails BC recreation areas. To account for forest retention in recreation areas and mapped trails, 666 hectares were removed from the THLB.

During a review of the analysis information, TOC staff noted that the Mount Begbie trail was incorrectly included in the THLB, and on this account the THLB of the Cascadia TSA and the TOC is overestimated by 7.4 hectares.

With the exception of the Mount Begbie trail, I accept that recreation areas have been appropriately accounted for in the TOC base case. However, given the magnitude of the THLB overestimation, this factor has a negligible, if any, effect on the TOC base case and requires no further consideration in this determination.

- *cultural heritage resources*

A cultural heritage resource (CHR) is defined in the *Forest Act* as "an object, site or location of a traditional societal practice that is of historical, cultural or archeological significance to the province, community, or an aboriginal people". CHRs include, but are not limited to, archaeological sites, structural features, heritage landscape features, important harvest areas and traditional use sites.

Archaeological sites, including culturally modified trees that pre-date 1846, are protected from timber harvesting under the *Heritage Conservation Act*. There are 29 known archaeological sites within the Cascadia TSA. In the analysis application of a 25-metre buffer to all sites resulted in the removal of 103 hectares from the Cascadia TSA THLB.

Cultural heritage resources are managed in accordance with the applicable legal requirements and with the participation of First Nations. During operational planning, proposed harvesting activity is reviewed by local First Nations which may request specific sites with identified cultural values or features be protected. The values that typically require protection are varied and BCTS has indicated that First Nation's requests can almost always be accommodated within reserve areas such as wildlife tree retention areas, riparian reserves and old growth management areas. Therefore, a specific reduction to the THLB, incremental to the reduction for archaeological sites and other reductions, for cultural heritage resources was not applied in the business area base cases.

I note that the business area base cases did not account for areas that will be excluded from harvesting in order to protect undiscovered archaeological sites or contemporary cultural heritage features, such as resource gathering sites and traditional use areas. Since engagement with First Nations on site-level plans is likely to result in areas being reserved to protect such sites, or other important cultural areas not accounted for in the timber supply analysis, I conclude that there is a small, unquantified overestimation in the base cases. Further discussion regarding cultural heritage resources is included under '**Reasons for Decision**'.

- *Kitsumkalum Agreement-in-Principle*

In 2015, the Kitsumkalum First Nation and the Government of BC and Canada reached a milestone in the BC treaty process with the signing of an Agreement-In-Principle (AIP). The lands associated with the AIP represent the area that will likely be included in the actual treaty once it is finalized and implemented. However, until such time as the Kitsumkalum Treaty comes into effect and the AIP lands become Treaty Lands the area continues to contribute to the CFLB and the THLB of the Cascadia TSA within the TSK.

An Order in Council (OIC) issued on September 19, 2016 established an area, including the AIP lands, as the Kitsumkalum-Kitselas Designated Area No.1 under Section 169 (Part 13) of the *Forest Act* for the period ending June 30, 2025.

On June 18, 2018, a Ministerial Order (M228) was issued restricting the issuance of cutting permits, road permits and timber sales within the Kitsumkalum-Kitselas Designated Area No. 1 and suspending the rights of permit holders.

In order to assess the timber supply impacts associated with the exclusion of timber harvesting in the Kitsumkalum-Kitselas Designated Area No. 1, a sensitivity analysis was prepared in which the designated area within the TSK was excluded from the THLB. In total, the TSK THLB was reduced by 1318 hectares or 5.6 percent. In this forecast, the initial harvest level was 9310 cubic metres per year (7.4 percent) lower than in the TSK base case for the first 15 years, 6920 cubic metres per year (6.1 percent) lower for the next 15 years and 5020 cubic metres per year (4.9 percent) lower for the remainder of the forecast period.

During consultation, the Kitsumkalum First Nation commented "Kitsumkalum does not permit licensees to harvest within our AIP and as such this TSA should not include any AIP lands". In considering this comment, I am mindful that the Kitsumkalum Treaty is not yet in effect, and as such the AIP lands remain provincial land managed by the Province and contribute to timber supply. However, given that the OIC issued under Section 169 (Part 13) of the *Forest Act* and subsequent Ministerial Order (M228) effectively exclude the AIP lands from timber harvesting, I will be issuing an order under Section 173 (Part 13) of the *Forest Act*, immediately following this decision, reducing the new Cascadia TSA AAC attributable to the BCTS Skeena Business Area by 9310 cubic metres per year. This order will remain in effect until the Kitsumkalum-Kitselas Designated Area No. 1 expires or the Kitsumkalum Treaty is ratified. Once the Kitsumkalum Treaty takes effect, the AIP lands will no longer be provincial land and will be removed from the Cascadia TSA for future AAC determinations. I will refer to this Section 173 (Part 13) order in '**Reasons for Decision**'.

Expected rate of growth

- *natural stand yields*

In the analysis, stands established prior to 1976 (43 years or older in 2019) were considered natural stands. The timber yields for these stands were estimated using the Ministry's Variable Density Yield Prediction version 7 (VDYP7) model.

For the analysis, former TFL inventories were adjusted using the measurements of selected stand attributes collected from ground sample plots. The field sampling and inventory attribute adjustments were typically completed following the VRI Phase II process.

The former TFL 23 area (blocks 1, 2, 3 and 4 in TKO and TOC) has been re-inventoried with the majority of area re-inventoried in 2014, so there was no need to incorporate previously compiled inventory adjustments into the TKO and TOC base cases.

Although the former TFL 52 area (blocks 5 through 8 in TCC) and the former TFL 1 area (blocks 10 and 11 in TSK) had VRI adjustments completed prior to the formation of the Cascadia TSA, the adjustment factors applied were originally compiled using ground plot data collected over the entire TFL areas. However, those portions of the TFL transferred to the Cascadia TSA did not have sufficient sample plots within their respective blocks to allow for statistically-valid inventory adjustments and; therefore, none were applied in the TCC and TSK base cases.

An inventory adjustment was completed for block 9 (TSK) when it was in TFL 41; however, due to the lack of original plot data it was not possible to adjust the inventory in an unbiased manner for use in VDYP7.

BCTS acquired Light Detection and Ranging (LiDAR) data for the four business areas. LiDAR is a remote sensing technology that is used to collect detailed information about forest attributes, such as canopy height. An advantage of LiDAR is that it can be used to obtain tree heights for an entire area of interest rather than relying on the estimates derived from a limited number of ground samples within an area. However, prior to being used to update VRI data, LiDAR stand attribute predictions need to be validated by comparing the predicted values to actual ground sample data.

For the Cascadia TSA, when the LiDAR stand attribute predictions (e.g., height, basal area, diameter at breast height, and volume) were compared to data compiled from cruise plots, only predictions for average height and top height were deemed sufficiently reliable for use in the business area base cases. The LiDAR basal area, diameter at breast and net and gross stand volume predictions performed poorly when compared to the cruise plot data. Consequently, only the VRI stand heights were adjusted for use in VDYP7.

In order to assess the effect of uncertainty on the business area base cases, a series of sensitivity analyses were prepared in which the natural stand yield estimates were varied by 10 percent.

For the TKO, increasing natural stand yields by 10 percent increased the base case harvest levels by 11 percent and 10 percent for the first and second decades, respectively. The long-term harvest level was unchanged. Decreasing the natural stand yields by 10 percent decreased the base case harvest levels by 20.7 percent and 15.4 percent in the first and second decades, respectively. The long-term harvest level was decreased by 2.5 percent.

For the TOC, increasing the natural stand yields by 10 percent increased the base case harvest levels in the first and second decades by eight percent. The long-term harvest level was unchanged. Decreasing the natural stand yields by 10 percent decreased the first- and second-decade harvest levels by 7.1 percent and decreased the long-term harvest level by 3.3 percent.

For the TCC, increasing the natural stand yield by 10 percent increased the base case harvest levels in the first and second decades by 19 percent and 9.2 percent, respectively. The long-term harvest level was unchanged. Decreasing the natural stand yields by 10 percent decreased the first- and second-decade harvest levels by 6.1 percent. The long-term harvest level was unchanged.

For TSK, increasing the natural stand yields by 10 percent increased the base case harvest levels by 12 percent and 12.1 percent in the first and second decades, respectively. The long-term harvest level was unchanged. Decreasing the natural stand yields by 10 percent decreased the base case harvest levels by 20 percent and 11.4 percent, respectively. The long-term harvest level was decreased by two percent.

In considering the sensitivity analyses described above, I note that changes in the natural stand yield assumptions have significant effects on the base case short- to mid-term harvest levels for all business areas. These results highlight the importance of having sufficient ground sampling data and/or LiDAR information with which to reliably adjust natural stand yields. While I am prepared to accept that the best available natural stand yield estimates were used in the business area base cases; it is my expectation that FAIB will work to improve the LiDAR models available to predict basal area and diameter at breast height and will work with BCTS to address the forest inventory gaps for block 9 (TSK). These instructions are summarized under '**Implementation**'.

- *dead potential volume*

Inventory information and yield tables do not include volume from dead trees that could potentially be used as sawlogs. To derive estimates of dead potential volume for southern and northern interior TSAs and TFLs, a report entitled *Summary of Dead Potential Volume Estimates for Management Units within the Northern and Southern Interior Forest Regions* (2006) was completed by FAIB using data obtained from VRI Phase II ground sampling. This report indicates that, for the study area, incremental dead potential volume ranges from 3.7 percent to 7.6 percent of the green volume for stands over 60 years of age.

BCTS indicates that data specific to the stands in the Cascadia TSA is not available and the possible utilization of dead potential volume from the TSA has not been assessed. Consequently, the business area base cases did not include any assumed contribution from dead potential volume.

Given that the actual utilization of dead potential volume has not been assessed, I accept its exclusion from the inventory information and yield tables used in the business area base cases. However, I am mindful that secondary wood product manufacturers are experiencing a decrease in fibre supply as the volume of milling residue from primary producers decreases and that to some extent increased utilization of the dead potential volume could help to meet their fibre requirements. Consequently, it is my expectation that BCTS will both promote and track the utilization of dead potential volume so that it can be reflected in subsequent AAC determinations, as indicated in '**Implementation**'.

- *operational adjustment factors for managed stand yields*

Stands established in 1976 or later were considered managed stands in this analysis. Managed stand yield tables (MSYT) were produced using the Ministry's Tree and Stand Simulator (TASS) model version II. The yield tables generated using TASS are based on the data from research plots established by the Ministry and industry. Historically, this research has been carried out in fully stocked, even-age stands with no significant incidences of pests or diseases. Operational adjustment factors (OAF) are applied to the TASS generated yields to better reflect actual growing conditions.

OAF 1 reduces the managed stand yields to reflect non-productive areas in the stand, uneven crop tree spacing, losses due to endemic levels of pests and disease and random loss. The standard OAF 1 of 15 percent was applied to the managed stand yields for all business areas. OAF 2 allows for increasing volume losses towards maturity, attributable to decay, waste and breakage, disease and pest factors. The standard OAF 2 of five percent was applied to all of the managed stand yield curves generated by TASS for use in the TCC and TSK base cases.

For the TKO and TOC base cases, the OAF 2 was adjusted to better account for additional volume losses due to *Armillaria* root rot. These adjustments reflect the results of research completed by the Canadian Forest Service and were utilized in the recent timber supply review for the Arrow TSA.

Although I accept that the OAFs used in the base cases reflect the best available information, I am concerned that they may not reflect changes in the incidence of pests and diseases and local growing conditions, particularly in the face of climate change. In order to address this knowledge gap, the Ministry has initiated several monitoring programs, such as the Young Stand Monitoring (YSM) program. Therefore, as noted under '**Implementation**', it is my expectation that FAIB will work with BCTS to establish a YSM program in the Cascadia TSA so that this information will be available for use in subsequent AAC determinations.

- *minimum harvest criteria*

Minimum harvest criteria are the earliest age, volume per hectare, or other criteria at which stands become eligible for harvest. For the Cascadia TSA business area base cases, stands were required to meet both minimum harvestable volume (MHV) criteria and have attained 95 percent of their maximum annual growth increment or culmination mean annual increment (CMAI).

The MHV criteria used in the base cases varied by business area and method of harvest. TKO stands were required to have MHVs of 150 cubic metres per hectare and 200 cubic metres per hectare for ground and cable harvesting, respectively. TOC stands were required to have MHVs of 200 cubic metres per hectare and 250 cubic metres per hectare for ground and cable harvesting, respectively. TSK stands were required to have MHVs of 250 cubic metres per hectare for both ground and cable harvesting. TCC stands were required to have MHVs of 110 cubic metres and 200 cubic metres for ground and cable harvesting, respectively.

A review of the Forest Tenures Administration (FTA) data for the five-year period (2014 – 2018) showed that most of the harvest activity in the Cascadia TSA occurs in mature and old-growth stands with volumes between 250 cubic metres per hectare and 450 cubic metres per hectare. Approximately 10 percent of the harvested cutblocks had volumes less than 150 cubic metres per hectare. The age and volume of the harvested cutblocks correlated well with the VRI profile.

In response to my concern regarding the level of harvest performance in stands with minimum volumes as low as 110 cubic metres per hectare in the TCC, BCTS provided a summary of timber sales from 2012 to 2019. This information indicates that over 70 percent of the sales in the TCC were for stands with more than 260 cubic metres per hectare, while 4.8 percent of the sales were for stands with volumes less than 160 cubic metres per hectare. Only 2.1 percent of sales were for stands with less than 110 cubic metres per hectare.

In a sensitivity analysis, increasing the MHV for all stands in the TCC by 50 cubic metres per hectare (i.e., from 110 cubic metres per hectare to 160 cubic metres per hectare for ground harvesting and from 200 cubic metres per hectare to 250 cubic metres per hectare for cable harvesting) resulted in mid- and long-term harvest levels 1.6 percent and 2.5 percent below the TCC base case levels, respectively. The short-term harvest level was 2.8 percent higher than in the base case; however, this was considered to be a modelling artifact attributable to minor changes in the harvest schedule in the model.

Based on my consideration of the minimum harvest criteria and discussions with Ministry staff, I conclude that the criteria used in the TKO, TOC and TSK base cases reasonably reflect current practice. For the TCC, I note that the ability of BCTS to sustain the harvest levels projected in the TCC base case is dependent on the ability of timber sales licensees to harvest these lower volume stands. As indicated under '**Implementation**', it is my expectation that BCTS will carefully monitor harvest performance in low volume stands to ensure that the minimum harvest volume criteria are operationally feasible and consistent with the assumptions used in the business area base cases.

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

No factors considered under this section require additional comment.

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

No factors considered under this section require additional comment.

Section 8 (8) (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

- *timber utilization*

The merchantable timber specifications define the maximum stump height, minimum top diameter inside bark (dib) and minimum diameter at breast height (dbh) by species and are used to calculate merchantable volume. In the business area base cases, a 30-centimetre maximum stump height and a 10-centimetre minimum top dib were modelled for all species. The minimum dbh for all conifer species, except pine, was 17.5 centimetres. A 12.5 centimetres minimum dbh was modelled for pine.

I have considered the timber utilization used in the business area base cases and accept that they reflect current requirements. However, I encourage BCTS to increase timber utilization beyond the current requirements, where possible, to increase the biomass recovery from harvested stands to improve fibre supply and for carbon sequestration.

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

Integrated resource management objectives

The Ministry is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

- *higher-level plans*

The Cascadia TSA falls under four legally-established land use plans: the Kootenay-Boundary Higher Level Plan Order (KBHLPO), which applies to the TKO; the Revelstoke Higher Level Plan Order (RHLPO), which applies to the TOC; the Cariboo-Chilcotin Land Use Plan (CCLUP), which applies to the TCC; and the Kalum Sustainable Resource Management Plan (KSRMP), which applies to the TSK. As described in the Information Package (2018) and Timber Supply Analysis Report (2019), the timber supply modelling undertaken for the Cascadia TSA reflects the requirements stated in these higher-level plans.

For this determination, I am satisfied that the higher-level plan requirements were appropriately reflected in the relevant business area base cases, and no adjustments are required.

- *Gitwangak Land Use Plan*

The Gitxsan hereditary chiefs associated with the Gitxsan watershed of the Lower Skeena, or Gitwangak, have formed their own society - Simgiget'm Gitwangak Society (SGS) - and are participating in one of three Gitxsan Watershed Engagement Pilot projects. The SGS independently developed the Gitwangak Land Use Plan (GLUP), which they presented to the provincial government in April 2017. The GLUP has not been established as a legal land use plan; however, many of the values identified in the plan are covered by legal objectives in the Kalum SRMP and GAR Orders and harvesting is consistent with these legal objectives.

The GLUP covers 275 000 hectares of which 9866 hectares or 3.6 percent of the total GLUP area overlap with TSK block 11. The GLUP area overlaps with 91 percent of block 11 but does not overlap with either block 9 or 10. The Gitwangak territory is divided into 23 houses under separate hereditary chiefs. The GLUP area overlapping block 11 represents 16 percent of the watershed territory of Tenim Gyet (Art Mathews Jr.).

The GLUP documents the Gitwangak cultural and natural resource values and specifies resource management zones for ecosystem networks, old growth management areas, Gitwangak cultural sites/places of importance, and valued wildlife habitat areas. It also specifies areas that are not ecologically appropriate for timber harvesting or industrial development, and water management units.

BCTS considers the GLUP an expression of Gitxsan interests. Prior to cutblock development, TSK staff complete a spatial analysis for every TSK cutblock that is within the GLUP area in order to identify those GLUP management zones that fall within the cutblock boundaries. Many of the values in the GLUP are covered by legal objectives in the Kalum SRMP and GAR Orders (e.g., grizzly bear winter range, mule deer winter range, old growth management areas, special management zones and community watersheds) and harvesting plans are consistent with these legal objectives. For other GLUP values, BCTS considers the values and, where operationally feasible, incorporates the protection of these values into the block-level development plans.

In a letter dated April 18, 2019, the Gitxsan SGS recommended incorporating the GLUP in the TSK base case and noted that although the GLUP is not a legal plan, it is being implemented by a number of forest licensees. The SGS is concerned that without recognition of the Gitwangak Lax'yip, the block 11 portion of the Gitwangak Lax'yip will be severely overcut by the administration of an AAC that is applicable to a much larger area. On this basis, they requested the Chief Forester set an AAC for the Gitwangak Lax'yip.

The GLUP has not been established as a legal plan by government; therefore, it was not reflected in the TSK base case. However, those values within the plan that are covered by the Kalum SRMP and GAR Orders were included in the base case.

Following discussions with the Gitxsan SGS, BCTS directed Forest Ecosystem Solutions to complete additional sensitivity analysis to assess the timber supply effects of implementing the GLUP. The results were provided to the Gitxsan SGS in a report entitled the *BCTS Gitwangak Land Use Plan Sensitivity Analyses*.

During discussions, the Gitxsan SGS confirmed that the GLUP could be appropriately modelled by removing the GLUP ecosystem networks and network buffers, high-value wildlife habitat and water management units from the THLB. After accounting for overlaps with areas previously excluded to account for other factors, these changes reduced the THLB by 1421 hectares or 5.9 percent.

In the following five sensitivity analyses, ecosystem networks, ecosystem network buffers, high value wildlife habitat and water management units were removed from the THLB. In addition, a 25 percent maximum equivalent clearcut area modelling constraint was enforced on the Cedar Watershed.

In the first sensitivity analysis, which applied the GLUP requirements to the TSK forecast, the TSK base case initial harvest level decreased by 9.6 percent from 126 070 cubic metres per year to 113 900 cubic metres per year for the first 15 years of the forecast. For the second 15-year period, the harvest level decreased by 8.7 percent from 113 900 cubic metres per year to 103 950 cubic metres per year and the long-term harvest level decreased by 7.7 percent from 102 830 cubic metres per year to 94 930 cubic metres per year.

In the second sensitivity analysis, which was a forecast for the block 11/GLUP area only (not the entire TSK area), an even-flow harvest level of 15 950 cubic metres per year was maintained for the entire forecast period.

In the third sensitivity analysis, which was also limited to the block 11/GLUP area, the harvest level was allowed to increase after 75 years, the harvest level increased by 14 percent to 18 190 cubic metres per year.

In the fourth and fifth sensitivity analyses, which forecasted the whole TSK area but targeted an even-flow for the block 11/GLUP area, it was not possible to achieve a harvest target of 15 950 cubic metres per year for the block 11/GLUP area, even when the target was only applied for the first 75 years of the forecast period. The highest harvest level that could be attained was 13 970 cubic metres per year.

BCTS staff note that for the most recent five-year period (2014-2019) the total harvest from the block 11/GLUP area was 50 858 cubic metres, averaging 10 172 cubic metres per year. This level is 27 percent lower than the highest block 11/GLUP harvest level – 13 970 cubic metres per year.

In a letter, dated August 3, 2019, the Gitxsan SGS requested that I accept and consider their information package, which consists of the SGS report of April 18, 2019, the contents of the letter, and the *BCTS Gitwangak Land Use Plan Sensitivity Analyses.* The SGS asked that I recognize and accept the GLUP and the results of the GLUP sensitivity analyses in my determination of the Cascadia TSA AAC. In addition, the SGS asked me to "partition the Cascadia TSA AAC within the Skeena (TSK) Business Area to provide a portioned and enforceable allowable annual cut applicable to the Gitwangak Lax'yip within block 11 of the TSK Business Area" and that this partition be set at 13 970 cubic metres "to provide a steady-state, non-declining timber flow from the GLUP area that will balance within +/-10% over five-year period."

I have carefully reviewed the information provided to me by the Gitxsan SGS, including the Simgiget'm Gitwangak Society Report (April 18, 2019) and *BCTS Gitwangak Land Use Plan Sensitivity Analyses* (July 15, 2019) and I have considered the requests outlined in their letter to me dated August 3, 2019 as follows. With respect to recognition of the Gitwangak Land Use Plan: I note that although this plan has not been established as a legal plan by government, many of its requirements have been given legal effect under the Kalum SRMP and GAR orders and, as such, were reflected in the TSK base case I accepted for use in this determination. Regarding recognition of GLUP values that have not been established as legal

objectives, I note that I do not have the authority to establish legal objectives and, in keeping with my guiding principles, I will not speculate on the timber supply impacts that may eventually result from these land-use designations. However, if government establishes the GLUP as a legal land use plan, I am prepared to re-visit this decision earlier than required under Section 8 of the *Forest Act.* In the interim, I note that BCTS currently works with the SGS at an operational level to incorporate protection of those GLUP values that have not been legally established.

With respect to the request that I establish a partition attributable to Gitwangak Lax'yip within block 11 of the TSK, I share the Gitxsan SGS concern regarding the potential concentration of harvesting in one business area that could result from an unpartitioned AAC for the Cascadia TSA. In recognition of this risk, I will be instituting partitions in the Cascadia TSA AAC, attributable to each of the constituent business areas, as discussed in '**Reasons for Decision**'.

The TSK business area partition will be attributable to blocks 9, 10 and 11 and as such will exceed the 13 970 cubic metres per year requested by the SGS for the Gitwangak Lax'yip for block 11. However, establishment of a TSK partition will significantly reduce the risk of a concentration of harvesting within the Gitwangak Lax'yip in block 11, and this will help to accommodate Gitxsan interests in this area. In addition to the protection afforded by the partition, I note that the average annual rate of harvesting in the Gitwangak Law'yip in block 11 over the last five years has been 10 172 cubic metres per year, which is significantly lower than 13 970 cubic metres year.

I would like to thank the Gixsan SGS and BCTS for the additional information provided for my consideration in this determination. I encourage BCTS to continue its collaboration with the Gitxsan SGS during its operational planning for cutblock development.

- *landscape-level biodiversity*

The *Forest and Range Practices Act* (FRPA) defines biodiversity as "the biological diversity of plants, animals and other living organisms in all their forms and levels of organization, including the biological diversity of genes, species and ecosystems". Landscape-level biodiversity is conserved by maintaining forests with a variety of patch sizes and seral stages across a variety of ecosystems and landscapes. Given other forest management objectives that provide for a diversity of forest stand conditions, old-forest retention is a key landscape-level biodiversity consideration and is a requirement under FRPA.

In the Cascadia TSA, landscape-level old growth objectives have been met by the establishment of old growth management areas (OGMA) in all of the BCTS business areas, with the exception of the TSK, where aspatial targets are used in conjunction with OGMAs. There are both legal and "non-legal" OGMAs in the TSA. Legal OGMAs have been established through the issuance of legal orders; whereas, "non-legal" OGMAs are subject to a notice stating that they will meet the requirements of Section 8 in the Order Establishing Provincial Non-Spatial Old Growth Objectives (Old Growth Order).

The Kootney Boundary Higher Level Plan Order (KBHLPO), Revelstoke Higher Level Plan Order (RHLPO), Cariboo-Chilcotin Land Use Plan (CCLUP) and the Kalum Resource Management Plan (KSRMP) provide additional direction for managing landscape-level biodiversity.

- TCC

In 2010, government issued a Land Use Order under Section 93.4 of the *Land Act* that established landscape units and land use objectives, including landscape-level biodiversity objectives, for the CCLUP area. The landscape-level biodiversity objectives for old growth are managed by retaining forest in OGMAs. In order to account for the OGMAs in the TCC, 3945 hectares were removed from the THLB. Additional targets specified in the land use order for "mature plus old seral" requirements to maintain landscape-level biodiversity were set for each landscape unit and biogeoclimatic zone (LU/BEC) combination. All landscape units, with the exception of Umiti and Antler, are currently meeting their targets for mature-plus-old stands. In deficit landscape units, BCTS employs a mature recruitment strategy which

reserves less than mature forests in no-harvest areas in order to meet the specified targets as soon as possible. All targets were modelled as seral stage retention constraints in the TCC base case.

- TSK

Land use objectives, including landscape-level biodiversity objectives, for the KSRMP area were established by a land use order issued under the *Land Act* in 2006. The landscape-level biodiversity objectives for old growth are managed by retaining forest in OGMAs. In order to account for the OGMAs, 5716 hectares were removed from the TSK THLB. The land use order also established old, mature and early seral stage requirements for each LU/BEC unit. These requirements were modelled as seral stage retention constraints in the TSK base case.

- TKO

The KBHLPO (October 2006) established resource management zones and resource management objectives, including biodiversity emphasis options and old and mature forest requirements for the plan area. In order to account for the old growth requirements, which are assumed to be met through the establishment of "non-legal" OGMAs, 26 974 hectares were removed from the THLB. In addition to old forest retention, the KBHLPO set targets for mature-plus-old forest retention, and landscape connectivity. It also established regional forest ecosystem connectivity corridors and specifies that mature-plus-old requirements must be preferentially located inside connectivity corridors. The TKO base case included mature-plus-old-forest targets for each LU/BEC in the Halfway and Trout Landscape Units, which are the only two landscape units with mature-plus-old-forest targets in the plan area that overlap the Cascadia TSA. The targets were applied only to the Cascadia TSA portion of the landscape units and were prorated by area from the full landscape unit-level targets.

The old forest retention mature-plus-old forest retention, and landscape connectivity targets applied in the TKO base case were based on the version of the biogeoclimatic classification (BEC) in place at the time the KBHLPO was issued in 2002. Changes in the BEC classification in 2016 resulted in area changes in the BEC variants and seral stage target areas. In a sensitivity analysis, utilizing the latest version of the BEC classification reduced the mid-term harvest level by one percent.

- TOC

The RHLPO (March 2005) established biodiversity objectives and mature-plus-old forest requirements. In 2011, the order was amended to remove the mature forest requirements and to update the biodiversity objectives. In order to account for the old growth requirements, which are assumed to be met through the establishment of "non-legal" OGMAs, 6849 hectares were removed from the THLB.

I have considered the landscape-level biodiversity information used for each of the business area base cases, and, with the exception of the TKO, I accept that the assumptions used are consistent with legal requirements and I will make no adjustments to the base cases on this account. For the TKO, use of an outdated version of the biogeoclimatic classification resulted in a one-percent underestimation in the base case mid-term harvest level and I will account for this in my determination as discussed in '**Reasons for Decision**'.

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

Other information

- *harvest performance in the Cascadia TSA*

Harvest performance information for Cascadia TSA is reported annually by the Ministry. Based on the most recent report (*Provincial Timber Management Goals, Objectives and Targets – Management Unit Targets for the Cascadia TSA (September 2019) for the period 2011 – 2018*, the average annual harvest for the Cascadia TSA over the last five years is about 280 000 cubic metres per year, which is about 70 percent of the current AAC. However, the annual harvest volume has been steadily increasing from about

60 000 cubic metres per year in 2012 to a high of about 450 000 cubic metres per year in 2017, as BCTS ramped up its operations in the newly formed TSA.

In addition to harvest volume, the report also provides a comparison of the species profile of the harvested timber and the species profile of mature timber available on the Cascadia TSA THLB. This metric showed that, during the period 2011 – 2018, the proportions of balsam (15 percent) and spruce (20 percent) harvested were significantly lower than the proportions of mature balsam (30 percent) and spruce (32 percent) available on the THLB. The proportion of cedar (10 percent) and Douglas-fir (11 percent) harvested were significantly higher than the proportions of mature cedar (less than two percent) and Douglas-fir (less than one percent) available on the THLB.

Based on my review of the harvest performance information and discussions with staff, I conclude that although the average harvest volume over the last five years is about 30 percent less than the available AAC, the overall trend shows that utilization of the AAC has been increasing since the creation of the Cascadia TSA. With respect to the species profile, I am concerned about the disproportionate harvest of cedar and Douglas-fir relative to the VRI profile, as a continued concentration of harvesting in the higher value species may adversely affect the future economic viability of stands in the TSA. For this reason, it is my expectation that BCTS will work to align the species composition of the harvest with the VRI profile, as indicated in '**Implementation**'.

- *climate change*

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

The Ministry has prepared a series of extension notes for the province that summarize the projected climate changes, impacts to ecosystems, and potential adaptation strategies for each region. The intent of the extension notes is to inform the adaptation of natural resource planning and practices to climate change by providing the best available information to resource professionals, licensees and government staff engaged in: forest management; monitoring the effectiveness of adaptation practices; assessing cumulative effects; and, preparing climate change action plans. The four extension notes that pertain to the Cascadia TSA are: *Adapting Natural Resource Management to Climate Change in the Kootenay Boundary Region (2016)* (TKO); *Adapting Natural Resource Management to Climate Change in the Thompson Okanagan Region (2016)* (TOC); *Adapting Natural Resource Management to Climate Change in the Cariboo Region (2016)* (TCC)*;* and, *Adapting Natural Resource Management to Climate Change in the Skeena Region (2016)* (TSK).

As described in the extension notes, climate change is predicted to impact forest ecosystems in a number of ways including a general increase in temperatures, change in precipitation patterns, and an increase in the frequency and severity of disturbances including wildfires, floods, landslides, and occurrences of insects and disease. Although research is ongoing, it is difficult to determine the magnitude of the climate changes and the implications for forests, as well as forest and land management responses; a significant amount of uncertainty still exists. Therefore, it will be worthwhile during the term of this determination for the province to continue to consult and collaborate with federal government agencies, First Nations, academic institutions, and stakeholders to better understand climate adaptation and mitigation challenges and opportunities in relation to forest management. I am aware that FAIB is collaborating with climate, growth and yield and timber supply specialists to integrate climate change considerations into timber supply, growth and yield and natural disturbance models to help inform future determinations.

In making this AAC determination, I have considered the available information about the effects of climate change and the potential impacts of these changes on forest conditions in the Cascadia TSA. As noted in '*Guiding principles for AAC determinations*' incorporating climate change in decisions like AAC determinations is challenging due to the high level of uncertainty about the changes, and the wide range of potential responses. Given this uncertainty about future climate changes I will not speculate on their potential timber supply effects in this determination. However, the requirement for regular AAC

determinations will mean that emerging knowledge and changes in forest practices instituted to mitigate or adapt to climate change will be incorporated in future AAC determinations.

I encourage BCTS to continue to work collaboratively with Ministry staff to monitor climate changes, collect information to inform future AAC determinations and develop climate-change mitigation strategies. I am aware of ongoing efforts to mitigate the impact of climate change, such as development of climate-based seed transfer standards, monitoring of plantations for drought stress and assessing stocking standards to address natural disturbance. Any additional information and corresponding analysis that helps the Ministry increase understanding of how forest management decisions can be adapted to mitigate impacts will be incorporated into future timber supply reviews.

- *cumulative effects*

Cumulative effects are changes to social, economic and environment conditions caused by the combined impact of past, present and potential human activities or natural events. The Government of BC has supported the phased implementation of the Cumulative Effects Framework (CEF) that aims to provide relevant information and supporting policy to address these cumulative effects. The CEF does not create new legislative requirements; rather it informs and guides cumulative effect considerations through existing natural resource sector legislation, policies, programs and initiatives. Integrating the CEF into existing natural resources decision-making processes and enabling cross-section governance will ensure that cumulative effects are identified and managed in a consistent manner across BC.

The CEF gives resource managers the procedures and tools to inform decisions that support sustainable management and the needs of many different users. First Nations will be able to use cumulative effects assessments to monitor the condition of values important to them; while government can use the assessments to help support its obligations for considering cumulative impacts on First Nations Aboriginal Interests.

A provincial Cumulative Effects Team has been established and is focusing on implementing cumulative effects assessments within pilot areas across the province, building assessment procedures for values, and developing policies and procedures. Specific regional CEF assessments related to the Cascadia TSA are discussed below.

The Elk Valley Cumulative Effects Management Framework project is currently the primary cumulative effects project in the Kootenay-Boundary Region. Cumulative effects assessments have been completed for the following four initial priority valued components: aquatic ecosystems, old and mature forest, grizzly bear and bighorn sheep. The results of these assessments were not considered directly applicable to the TKO base case as the Elk Valley is far from the TKO (blocks 1-3).

In 2015, the Cariboo-Chilcotin Region released *A Broad Scale Cumulative Impact Assessment Framework for the Cariboo-Chilcotin* that describes an assessment methodology and standardized descriptions of risk factors for broad-scale assessments covering six valued ecosystem components; biodiversity, hydrology, marten, moose, mule deer and grizzly bear. Regional cumulative effects assessments have been completed for most of the Cariboo-Chilcotin Region including the Quesnel Natural Resource District, TCC (blocks 5-8). The results of these assessments have been distributed to forest resource managers to support management decisions at the strategic and operational level.

The Skeena Sustainability Assessment Forum and North Coast Regional Stewardship Forum are currently undertaking cumulative effects projects in the Skeena Region. These projects are in partnership with multiple First Nations and the province under the Environmental Stewardship Initiative. In a letter dated August 2, 2018, the Kitsumkalum Indian Band shared their concerns regarding moose habitat in the TSK block 11. These concerns are discussed under *Cumulative Effects Framework: Moose in the Kitsumkalum-Cascadia TSA.*

Based on my review of the cumulative effects information and discussions with staff, I conclude that the business area base cases reasonably reflect current management, the current status of the effects of past and present industrial activity on the land base, and the legal objectives established by government for various

non-timber resources. Therefore, I will make no adjustments to the business area base cases on this account. I do note that many of the current objectives and resource management practices applied in the Cascadia TSA already help to mitigate the negative effects of development activities and that any new objectives and changes in resource management that occur through implementation of the Cumulative Effects Framework will be considered in subsequent determinations.

- *cumulative effects framework: moose in the Kitsumkalum-Cascadia TSA*

The traditional territory of the Kitsumkalum overlaps with block 11/TSK of the Cascadia TSA (Kitsumkalum-Cascadia TSA).

During consultation the Kitsumkalum shared the following concerns in a letter dated August 2, 2018:

This area is important moose habitat and hunting area for the Kitsumkalum. Mature forests help provide snow interception in the winter as well as food for the wildlife and our people. The disturbing trend in this area has been proponents removing leave strips and small patches of remaining timber between the already cutblocks. Without these cover areas and food sources the wildlife is easily predated upon by wolves. Larger timber reserves along the rivers and allowing timber to mature further prior to harvesting are imperative to protecting the forest resources (both timber and non-timber). When these resources disappear, it has significant adverse effects on Kitsumkalum Aboriginal Title and Rights. These impacts are not solely from the TSA but are stacking up cumulatively. It has been harder and harder to harvest and practice traditional harvest and wild source our food, resources and traditional medicines. This must be heavily considered when reviewing this Timber Supply Area.

In response to these concerns, the Ministry prepared a Cumulative Effects Framework assessment to examine the current condition of moose in the Kitsumkalum-Cascadia TSA, entitled: *Current Condition Report for Moose in the Kitsumkalum Portion of the Cascadia Timber Supply Area 2018 Analysis* (2018 Moose Report). The objective of this report is to inform collaborative discussions among government decision makers and the Kitsumkalum Band Council. The report examines the status of moose populations, the capacity of moose habitat to provide adequate food and shelter, and the risks associated with human presence in moose habitat.

The standardized provincial methods, outlined in the *2018 Interim Assessment Protocol for Moose in British Columbia - Standards for British Columbia's Cumulative Effects Framework Values Foundation*, were applied to assess the current condition of moose in the Kitsumkalum-Cascadia TSA and the results were included in the *2018 Moose Report*. In the report, major threats to moose were identified as the continued expansion of the energy sector, agriculture and forestry activities and the resultant increase in linear corridors, such as roads. Other identified threats included human predation and climate change. The report provided recommendations aimed at enhancing moose populations and habitat in the Kitsumkalum-Cascadia TSA. Of these recommendations, several relate directly to forest management practices, including the following:

1. Forest planning and practices (including the use of prescribed herbicides and burning) should be adjusted in priority moose habitat to conserve or enhance seasonal forage and habitat (e.g., shrub and broadleaf plants);
2. Moose winter ranges should be established in locations where there is good quality moose habitat but populations are at risk due to the combined effects of high road density, hunting and low availablity of core effective winter habitat;
3. Roads should be deactivated and/or road and linear corridor access should be restricted in areas of high priority moose habitat to minimize the risk to moose; and,
4. Access management planning across the region should be prioritized to limit the impact of roads by limiting the number of new roads and decommisioning old roads in areas where wildlife conservation is a priority.

I have carefully considered the comments and information provided by the Kitsumkalum that outline adverse effects that the harvesting of mature forests will have on Kitsumkalum Aboriginal rights and title, including traditional harvest of wild-source food, resources and traditional medicines. I have also reviewed the recommendations provided in the *Current Condition Report for Moose in the Kitsumkalum Portion of the Cascadia Timber Supply Area 2018 Analysis*, and received input from Ministry staff at BCTS and the district office regarding the extent to which current practice in the TSA that are mandated by existing legislation, regulation, planning documents and engagement with First Nations at the operational level have been effective in mitigating adverse impacts on Kitsumkalum interests. Based on these considerations, I conclude that adverse impacts on Kitsumkalum interests are likely to be effectively mitigated or minimized through the implementation of the existing legislative framework and through meaningful collaboration and engagement with the Kitsumkalum at the operational level. In addition, as discussed under '*Kitsumkalum Agreement-in-Principle*', the potential risks to moose populations are further reduced by the designation of the Kitsumkalum AIP area under Part 13 of the *Forest Act* and issuance of a Ministerial Order that restricts the issuance of cutting permits, road permits and timber sales, and suspends the rights of permit holders.

In order to further reduce the risks to moose populations, as identified in the *2018 Moose Report*, it is my expectation that BCTS will work with other resource development agencies to minimize the development of new roads and access corridors and, where possible, deactivate them. I also expect BCTS to work with the Kitsumkalum to plan and coordinate the use of herbicides and prescribed burning to enhance moose habitat and forest resources of interest to the Kitsumkalum. These expectations are summarized in '**Implementation**'.

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

Alternative rates of harvest

In addition to the business area base cases, I was provided with a number of alternative harvest forecasts, as follows:

- *TKO alternative harvest forecasts*

In the first alternative forecast, the initial harvest level was set at the current TKO AAC allocation of 112 650 cubic metres per year. This level is maintained for 10 years before decreasing in three steps to the mid-term harvest level of 72 460 cubic metres per year, which is 4.7 percent lower than in the base case. The long-term harvest level of 77 530 cubic metres per year, which is 1.2 percent lower than in the base case, is reached in year 196.

In the second alternative forecast, the highest possible non-declining harvest level for the TKO is 76 000 cubic metres per year, which is the same as the base case mid-term harvest level.

- *TOC alternative harvest forecasts*

In the first alternative forecast, the initial harvest level was set at the current TOC AAC allocation of 66 566 cubic metres per year. This level is maintained for 15 years before decreasing by 12.7 percent to the mid-term level of 58 125 cubic metres per year, which is 2.1 percent lower than in the base case. The long-term harvest level is 61 130 cubic metres per year, the same as in the base case.

In the second alternative forecast, the highest even-flow level for the TOC is 59 345 cubic metres per hectare, which is the same as the base case initial and mid-term harvest levels.

Following my review of these alternative forecasts, I requested an additional forecast in which harvest level decreases were not allowed to exceed 10 percent and the mid-term harvest level was not allowed to be more than two percent lower than in the base case. In the resultant forecast, an initial harvest level of 63 000 cubic metres per year is maintained for 10 years before decreasing in one step to the mid-term level of 58 100 cubic metres per year, which is 2.1 percent lower than in the base case. The long-term harvest level is 60 100 cubic metres per year, which is 1.7 percent lower than in the base case.

- *TCC alternative harvest forecasts*

In the first alternative forecast, the initial harvest level was set at the current TCC AAC allocation of 76 986 cubic metres per year, which is 39.4 percent higher than in the base case. This level was maintained for 10 years before decreasing in three steps to the mid-term level of 52 790 cubic metres per year, 4.3 percent lower than in the base case. The long-term harvest level of 58 790 cubic metres per year is the same as in the base case but is reached 45 years earlier than in the base case.

In the second alternative forecast, the highest possible even-flow alternative is the same as the short- and mid-term level in the base case 55 190 cubic metres per year.

Following my review of the alternative harvest forecasts and discussions with staff, I requested an additional harvest forecast in which the objective is to maximize the initial harvest level without reducing the mid-term harvest level by more than two percent from the base case level, while ensuring that the per decade reductions do not exceed 10 percent.

In the resultant forecast, an initial harvest level of 65 740 cubic metres per year, 19.1 percent higher than in the base case is maintained for 10 years, before decreasing to 60 025 cubic metres per year in year 11 and to the mid-term level of 54 115 cubic metres per year in year 21. The long-term harvest level of 58 790 cubic metres per year occurs at year 171, as in the base case. The mid-term harvest level of 54 115 cubic metres per year is 1.9 percent lower than in the base case.

- *TSK alternative harvest forecasts*

In the first alternative forecast, the initial harvest level was set at the current TSK AAC allocation of 141 616 cubic metres per year, which is 12.3 percent higher than the base case initial harvest level of 126 070 cubic metres per year. This level is maintained for 10 years before immediately decreasing by 27.3 percent to the base case mid-term level of 102 830 cubic metres per year.

In a second alternative forecast, the highest even-flow harvest level is 102 830 cubic metres per year which is the same as the mid- and long-term harvest levels in the base case.

Based on my review of the information described above I conclude that setting the initial harvest levels in the business area forecasts at the levels of the current business area AAC allocations results in significant decreases in mid-term timber supply. I also note that increasing the initial harvest level in the TOC forecast to 63 000 cubic metres per year and the TCC forecast initial to 65 740 cubic metres per year, levels that are between the current AAC allocation and base case initial harvest levels, limits the impact on the mid-term timber supply to about two percent. I will discuss my consideration of the alternative harvest further under '**Reasons for Decision**'**.**

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

<u>Economic and social objectives</u>

- *economic and social objectives of the Crown*

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 the letter dated October 30, 2017 (attached as Appendix 3), the Minister 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:

- 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.

The October 30, 2017, letter also asks that I do the following when making an AAC determination:

- ensure that the Ministry's approved strategies for delivering its forestry objectives are integrated into the TSR process;
- 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; and in addition support Government's commitment to review 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;
- consider traditional knowledge and other input from BC First Nation communities and organizations as they pertain to the AAC determination;
- consider how AAC determinations can support Government's 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 from factors such as insect infestations and wildfire while promoting forest health and values;
- 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, ensure the TSR identifies those risks for consideration in land-use planning;
- 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; and,
- when faced with necessary reductions in AAC's, that those reductions be no larger than necessary to avoid significant longer-term impacts.

I have considered the economic and social objectives of the Crown, as expressed by the minister throughout this determination.

First Nations considerations

The Crown maintains a duty to consult with and accommodate, as necessary, those First Nations for whom it has knowledge of claimed Aboriginal rights and/or title (Aboriginal Interests) that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations. The AAC determination as a strategic decision sets the stage for other decisions such as AAC apportionment and disposition, leading to issuance of cutting authorities. AAC determinations do 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. The AAC considers the sustainable harvest level from a particular 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 land 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 taken into

account 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.

There are 24 First Nation consultative areas that completely or partially overlap the following supply blocks within the Cascadia TSA: Neskonlith Indian Band (blocks 1, 2, 3, 4, 5, and 6); Secwepemc Reconciliation Framework Agreement (blocks 1, 2, 3, and 4); Okanagan Nation Alliance (blocks 1, 2, 3, and 4); Okanagan Indian Band (blocks 1, 2, 3, and 4); Adams Lake Indian Band (blocks 1, 2, 3, and 4); Westbank First Nation (blocks 1 and 2); Splats'in First Nation (blocks 1, 2, 3, and 4); Shuswap Indian Band (blocks 1, 2, 3, and 4); Little Shuswap Lake Indian Band (blocks 1, 2, 3, and 4); Ktunaxa Nation Council (blocks 1 and 3); Tsilhqot'in Engagement Zone 'A' (blocks 6, 7, and 8); Lhatko Dene Nation (blocks 5, 6, 7, and 8); Xats'ull First Nation (blocks 5 and 6); Tsilhqot'in Nation, Notice of Civil Claim (blocks 6, 7, and 8); Nazko First Nation (block 8); Kitsumkalum Band Council (block 11); Gitxsan Hereditary Chiefs (blocks 10 and 11); Kitselas First Nation (block 10); Skin Tyee First Nation (block 10); Wet'suwet'en First Nation (block 10); Metlakatla Band Council (block 10); Lax Kw'alaams Band (block 10); Office of the Wet'suwet'en, and the Haisla Nation (block 9).

All of the First Nations with territorial overlap with the Cascadia TSA have Forest Consultation and Revenue Sharing Agreements, Forest Tenure Opportunity Agreements, and/or First Nation Woodlands Licences. Many nations also had tenure opportunities related to the salvage of mountain pine beetle-impacted trees. These tenures are now ending.

- *information sharing and consultation process*

Consultation with First Nations on the AAC determination was undertaken by Ministry staff and began in October and November 2017. First Nations were consulted throughout the timber supply review; at the initiation of the process, and when the information package and timber supply analysis report were released.

None of the First Nations commented on the proposed levels of consultation. No responses were received from the Nazko and Wet'suwet'en First Nations, Skin Tyee Nation, and Lower Similkameen, Okanagan and Neskonlith Indian Bands. The Ktunaxa Nation Council, Lhtako Dene Nation, Lax Kw'alaams Band, Metlakatla Band Council, Tsilhqot'in National Government, Office of the Wet'suwet'en and Xats'ull First Nations responded with "no comment".

Responses from the Little Shuswap, Adams Lake and Secwepemc Shuswap Indian Bands and Splats'in First Nations responses indicated that this determination does not fall within the scope of the Qwelminte-Secwempc Letter of Commitment and deferred consultation to the "appropriate Secwepemc representative".

The Penticton Indian Band, Upper Nicola Band and Westbank First Nations provided no comment except to say that they deferred to the Okanagan Nation Alliance. No response was received from the Okanagan Nation Alliance.

Two letters were received from the Gitxsan SGS, dated April 18, 2019 and August 3, 2019. The details of these letters, government responses and my consideration of the report and recommendations received from the SGS are discussed under '*Gitwangak Land Use Plan'*.

Following discussions in October 2018, the Haisla Nation indicated that it would like the current Haisla juvenile spacing/restoration work noted in sensitivity analyses. Ministry staff responded indicating that as this work is not carried out within the Cascadia TSA it was not reflected in the analysis. The Haisla Nation also requested that the Coastal Gas Link Tenure Areas be reflected in sensitivity analyses. Ministry staff indicated that once the Coastal Gas Link right-of-way has been harvested the changes will be reflected in subsequent timber supply reviews.

The concerns shared by the Kitsumkalum First Nation regarding the Kitsumkalum Agreement-In-Principle lands and moose and other forest resources are discussed under '*Kitsumkalum Agreement-In-Principle*' and '*Cumulative Effects Framework: Moose in the Kitsumkalum-Cascadia TSA'*, respectively.

In October 2018, as per the Kitselas Consultation Agreement, a Shared Engagement Record was completed which included the discussion and recommendations. A second Shared Engagement Record was created on June 14, 2019. A consensus was achieved on all of the recommendations, which are summarized below.

Kitselas requested that retention and/or partial cut harvesting be used in the analysis. Ministry staff responded indicating that modelling clearcut with reserves was intended to account for the required level of stand retention. The default retention applied in the base case was based on the stand-level objectives for each area by landscape unit/biogeoclimatic zone, as described in the Kalum SRMP.

Kitselas asked if the existing five-year plans used in the analysis, particularly those for block 10, had been shared with the Kitselas. Ministry staff indicated that the five-year plans, including those for block 10, had been shared with Kitselas Forest Products. In addition, BCTS are submitting Early Engagement Records on an annual basis for the cutblocks to be developed each year.

Kitselas asked if the economic operability mapping for the Cascadia TSA had been recalculated following formation of the TSA. Ministry staff indicated that the existing operability classifications were reviewed and were deemed to be suitable for use in the analysis and discussed the operability descriptions provided with the Kitselas.

Kitselas shared its concerns regarding the sustainable long-term harvest for the BCTS Skeena Business Area (TSK) and the impact of harvesting on wildlife and cultural heritage conservation within its territory. Ministry staff responded indicating that wildlife within the TSK are protected under Government Action Regulation Orders and KSRMP Higher Level Plan Orders at the landscape level. According to BCTS, it conducts a Cultural Heritage Resource (CHR) evaluation on every cutblock planned for development, prior to road construction, and prior to mechanical site preparation to ensure that CHR features are maintained at the site level.

I have carefully considered the information and concerns raised by the Kitselas First Nation regarding the effects of timber harvesting on wildlife and heritage conservation within Kitselas territory. I also received input from Ministry planning and operations staff about the extent to which the current practices, as guided by the KSRMP, provide for the protection and conservation of wildlife habitat values, and I have heard from BCTS staff about their procedures to identify and protect cultural heritage resources during operational planning for the TSA. Having reviewed this information, I conclude that the impacts from timber harvesting on Kitselas First Nations interests related to wildlife and cultural heritage resources are effectively mitigated by practices that have been aligned to meet the conservation objectives set out in KSRMP and other elements of the current legislative framework such as objectives for the wildlife tree retention, riparian areas and ungulate winter ranges. I also note that meaningful collaboration between BCTS and Kitselas during operations planning, including CHR evaluations, will help ensure important cultural features in the TSA are identified and maintained.

I note that the TSK base case harvest levels are significantly lower than the current AAC allocated to the TSK; and as discussed in '**Reasons for Decision**', the new Cascadia TSA AAC attributable to the TSK will be lower than the current level. Although this reduction in the AAC is not directly attributable to wildlife, it may to some unknown extent accommodate Kitselas wildlife interests. With respect to CHR, I encourage BCTS to continue to meaningfully collaborate with Kitselas First Nation during site-level planning to identify and protect these critical values.

During consultation, Kitselas indicated that it does not have the expertise or capacity to adequately review the analysis report and provide specific recommendations. In lieu of this, Kitselas urges the Chief Forester to consider Kitselas' concerns, mentioned above, and take a precautionary approach when determining the Cascadia TSA AAC. In this respect, I note that government engagement with the Kitselas was completed in accordance with the Kitselas Consultation Agreement. In addition, as described above, government staff supported Kitselas engagement in the timber supply review by responding to Kitselas requests for clarification and information.

Following the Chief Forester's '*Guiding principles for AAC determinations*' and my review of the information sharing and consultation process, the Aboriginal Interests information available to Ministry staff, and the potential impact my decision may have on these interests, I believe that the Ministry has engaged in consultation in accordance with current provincial guidance and applicable case law.

I believe that any adverse impacts upon the Aboriginal Interests of the relevant First Nations stemming from forest development activities that occur subsequent to the Cascadia TSA AAC determination can be appropriately minimized or mitigated through existing legislation and regulation, planning processes, and meaningful engagement at the operational and strategic level.

Public engagement

BCTS instituted a 60-day public review period for both the *Information Package* and the *Timber Supply Analysis Report*. The availability of these documents for public review was advertised in local newspapers throughout the communities surrounding the Cascadia TSA and they were distributed to BCTS' stakeholders associated with the Cascadia TSA.

A number of requests for clarification and comments were received from both the Columbia Shuswap Regional District, Area 'B' Director. These comments include a reminder that the area is subject to the federal *Species at Risk Act* (SARA) orders regarding mountain caribou and that this timber supply review should not be completed until the results of the SARA action plan have been made public and that any timber supply assessments should comply with all SARA agreements and/or orders.

With respect to wildlife habitat, I note that all of the currently established legal requirements for wildlife in the Cascadia TSA, including wildlife habitat areas and ungulate winter ranges for mountain caribou, were reflected in the timber supply analysis, either as area exclusions from the THLB or through the application of forest cover constraints. In keeping with my guiding principles, I will not speculate on the eventual timber supply impacts that may result from land-use designations not yet finalized by government. In the event that new legal objectives or land use designations are established, the new requirements will be reflected in subsequent determinations.

The Kalum Planning Implementation Committee (PIC) commented on the timber supply analysis report as it pertains to blocks in the TSK. Most of these comments were addressed by Ministry staff who provided additional information or clarification, where necessary. Following an explanation of the 'fall-down effect' in timber supply as harvesting transitions from existing natural stands to managed stands, the PIC indicated that it still had concerns about the uncertainty in the data and future climate. It indicated that owing to the uncertainty in the data and future climate, the harvest level should be set at the Long Run Sustained Yield Level (LRSY) rather than starting at a higher level and reducing the harvest over time to the LRSY.

I acknowledge that one of the strategies for dealing with uncertainty may be to reduce AACs in the interests of caution. However, as indicated in my guiding principles, there will always be uncertainty in information, and due to the significant impact that AAC determinations have on communities, I believe that no responsible AAC decision can be made solely on the basis of a precautionary response. With respect to the uncertainty associated with climate change, I have outlined my approach in this document in "climate change".

I would like to thank those who participated in the timber supply review by discussing the process and information with staff or by providing me with additional information or comments for consideration in this determination.

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

Abnormal infestations and salvage programs

No factors considered under this section require additional comment.

Reasons for Decision

In reaching my AAC determination for the Cascadia TSA, I have considered all the factors required under Section 8 of the *Forest Act*. I have made the considerations documented above, all of which are integral to the reasons for my decision, and from which I have reasoned further as follows.

The Cascadia TSA differs from most other management units in BC in that its constituent timber supply blocks are widely dispersed, and the block groupings are managed by four BC Timber Sales (BCTS) business areas. BCTS, the sole operator in the TSA, has allocated the current Cascadia TSA AAC to the individual business areas and establishes annual harvest targets for each business area. Consequently, the fibre flow from each of the business areas is independent of the others. On this basis, I accepted the preparation of separate base cases for each of the business areas for use in my determination.

I am satisfied that the assumptions applied in the each of the business area base cases for the majority of the factors applicable to the Cascadia TSA were appropriately modelled and reasonably reflect current legal requirements, demonstrated forest management and the best available information.

In this section, I have summarized my considerations related to other factors where uncertainty exists or I have identified a need for some adjustment with respect to the analysis inputs, which in turn affect the base case timber supply.

<u>BC Timber Sales Kootenay Business Area (TKO):</u>

In the TKO base case, an initial harvest level of 101 420 cubic metres per year, which is about 10 percent lower than the TKO AAC allocation of 112 650 cubic metres per year, is maintained for two decades. Thereafter, the harvest level decreases to 91 570 cubic metres per year at year 21, to 82 440 cubic metres per year at year 41 and to the mid-term harvest level of 76 000 cubic metres per year at year 61. The mid-term level is maintained for 135 years before increasing to the long-term harvest level of 78 470 cubic metres per year at year 196.

I am aware of one factor that indicates an overestimation in the TKO base case timber supply to a degree that can be quantified, as follows:

- *Landscape-level biodiversity* – accounting for the use of an outdated version of the biogeoclimatic classification results in a one percent overestimation of mid-term timber supply.

I am also aware of one factor that indicates an overestimation in the TKO base case timber supply, but to a degree that cannot be quantified, as follows:

- *Cultural heritage resources* – accounting for the implications of managing for cultural heritage resources outside of known archaeological sites leads to a small, unquantified overestimation of timber supply in the mid- to long-term.

The net effect of these factors on the projected timber supply cannot be precisely quantified at this time, though indications from the timber supply analysis are that it is small; consequently, I will make no adjustment to the TKO base case on this account.

In establishing an appropriate harvest contribution for the TKO, I have also considered the alternative harvest forecasts and note the following. Setting the initial harvest at the level of the current TKO AAC allocation results in the mid-term harvest level being 4.6 percent lower than in the base case, which is the same as the highest non-declining harvest level (76 000 cubic metres per year). However, as evidenced in the base case, it is possible to maintain harvest levels significantly above the highest non-declining harvest level for the first 60 years of the forecast without reducing the mid- and long-term harvests below 76 000 cubic metres per year. From this, I conclude that a TKO harvest contribution of 101 420 cubic metres per year provides for an orderly transition from the current TKO AAC allocation to the lower mid-term levels without reducing the mid-term level below the highest even-flow level.

BC Timber Sales Okanagan-Columbia Business Area (TOC):

In the TOC base case, the initial harvest level of 59 345 cubic metres per year, which is about 11 percent lower than the TOC AAC allocation of 66 566 cubic metres, is maintained for 150 years before increasing to the long-term harvest level of 61 130 cubic metres per year.

I am aware of one factor that indicates an overestimation in the TOC base case timber supply, but to a degree that cannot be quantified, as follows:

- *Cultural heritage resources* – accounting for the implications of managing for cultural heritage resources outside of known archaeological sites leads to a small, unquantified overestimation of timber supply in the mid- to long-term.

Given that the impact of this overestimation on the TSA timber supply cannot be precisely quantified at this time and indications from the analysis are that it is small, I will make no adjustment to the TOC base case on this account.

In establishing an appropriate harvest contribution for the TOC, I considered the alternative harvest forecast that set the initial harvest level at the current TOC AAC allocation of 66 566 cubic metres per year. I noted that this forecast required the harvest level to decline by 12.7 percent after the first decade and had a mid-term harvest level that is 2.1 percent lower than in the base case.

In view of the magnitude of the timber supply reductions after the first decade in the TOC base case and alternative forecast described above, I requested an additional alternative forecast in which harvest level decreases were not allowed to exceed 10 percent and the mid-term harvest level was not allowed to be more than two percent lower than in the base case. In the resultant forecast, an initial harvest level of 63 000 cubic metres per year is maintained for 10 years before decreasing in one step to the mid-term level of 58 100 cubic metres per year, which is 2.1 percent lower than in the base case. The long-term harvest level is 60 100 cubic metres per year, which is 1.7 percent lower than in the base case.

These forecasts show that although harvest levels are projected to decline to a mid-term level of 59 345 cubic metres per year, it is possible to maintain a higher harvest level for the next decade without reducing the mid-term harvest level by more than two percent. Reducing the initial harvest level from 66 566 cubic metres per year to 63 000 cubic metres per year limits the decrease to the mid-term level to less than 10 percent. From this I conclude that a harvest contribution of 63 000 cubic metres per year for the TOC allows for a more gradual transition to the lower mid-term harvest levels projected in the base case. Extending the transition period in this manner will help to accommodate First Nations interests and provide communities and licensees more time to adapt to the timber supply reductions.

BC Timber Sales Cariboo-Chilcotin Business Area (TCC):

In the TCC base case, the initial harvest level of 55 190 cubic metres per year, which is about 28 percent lower than the TCC AAC allocation of 76 986 cubic metres per year, is maintained for 170 years before increasing to the long-term harvest level 58 790 cubic metres per year.

I am aware of one factor that indicates an overestimation in the TCC base case timber supply, but to a degree that cannot be quantified, as follows:

- *Cultural heritage resources* – accounting for the implications of managing for cultural heritage resources outside of known archaeological sites leads to a small, unquantified overestimation of timber supply in the mid to long term.

Given that the impact of this overestimation on the TSA timber supply cannot be precisely quantified at this time and indications from the analysis are that it is small, I will make no adjustment to the TCC base case on this account.

In establishing an appropriate harvest contribution for the TCC, I have also considered the alternative harvest forecasts.

In the first alternative forecast, the initial harvest level was set at the current TCC AAC allocation of 76 986 cubic metres per year. This level was maintained for 10 years before decreasing in three steps to the mid-term level of 52 790 cubic metres per year, 4.3 percent lower than in the base case. The long-term harvest level of 58 790 cubic metres per year is the same as in the base case but is reached 45 years earlier than in the base case.

In the second alternative forecast, the highest possible even-flow alternative is the same as the short- and mid-term level in the base case 55 190 cubic metres per year.

Following my review of the alternative harvest forecasts and discussions with staff, I requested an additional harvest forecast in which the objective is to maximize the initial harvest level without reducing the mid-term harvest level by more than two percent from the base case level, while ensuring that the per decade reductions do not exceed 10 percent.

In the resultant forecast, an initial harvest level of 65 740 cubic metres per year, 19.1 percent higher than in the base case is maintained for 10 years, before decreasing to 60 025 cubic metres per year in year 11 and to the mid-term level of 54 115 cubic metres per year in year 21. The long-term harvest level of 58 790 cubic metres per year occurs at year 171, as in the base case. The mid-term harvest level of 54 115 cubic metres per year is 1.9 percent lower than in the base case.

From this I conclude that a harvest contribution of 65 740 cubic metres per year for the TCC allows for a more orderly transition to the lower mid-term harvest levels projected in the base case. Extending the transition period in this manner will help to accommodate First Nations interests and provide communities and licensees more time to adapt to the timber supply reductions.

<u>BC Timber Sales Skeena Business Area (TSK)</u>

In the TSK base case, the initial harvest level of 126 070 cubic metres per year, which is about 11 percent lower than the TSK AAC allocation of 141 616 cubic metres per year, is maintained for 15 years before declining to the mid-term level of 113 770 cubic metres per year. The mid-term level is maintained for 15 years before increasing to the long-term harvest level of 102 830 cubic metres per year at year 31.

I am aware of one factor that indicates an overestimation in the TSK base case timber supply, but to a degree that cannot be quantified, as follows:

- *Cultural heritage resources* – accounting for the implications of managing for cultural heritage resources outside of known archaeological sites leads to a small, unquantified overestimation of timber supply in the mid- to long-term.

Given that the impact of this overestimation on the TSA timber supply cannot be precisely quantified at this time and indications from the analysis are that it is small, I will make no adjustment to the TSK base case on this account.

In establishing an appropriate harvest contribution for the TSK, I have also considered the alternative harvest forecast in which the initial harvest is set at the level of the current TSK AAC allocation. In this forecast the initial harvest level of 141 616 cubic metres per year is maintained for 10 years before decreasing by 27.3 percent in one step to 102 830 cubic metres per year, the highest even-flow level, for the remainder of the forecast period. The same decrease occurs if the initial harvest level is immediately reduced to the highest even-flow level. In the base case, the transition from the current AAC allocation to the mid-term occurs in three steps over 30 years: an immediate decrease of 11 percent to the initial harvest level, a second decrease of 9.8 percent after 15 years; and a final decrease of 9.6 percent after 15 years.

From this I conclude, that a TSK harvest contribution at 126 070 cubic metres per year avoids drastic reductions in harvest levels and provides for a longer transition period from the current TSK AAC allocation to the lower mid-term harvest levels projected in the base case.

In setting an AAC for an area such as the Cascadia TSA, in which the timber supply blocks are dispersed across a large geographic area and are managed by separate operational teams, I am mindful that there is a

risk that a disproportionate amount of the Cascadia TSA AAC could be harvested from one or more of the timber supply blocks. On this basis, I am establishing partitions in the AAC attributable to each of the BC Timber Sales Business Areas. Establishment of an AAC partition attributable to the BC Timber Sales Skeena Business Area will also help to address the concern expressed by the Gitxsan SGS regarding the risk overharvesting the block 11 portion of the Gitwangak Lax'yip.

In order to account for the Kitsumkalum-Kitselas Designated Area No. 1 established by an order in council issued under Section 169 (Part 13) of the *Forest Act* and subject to a subsequent Ministerial Order (M228) that effectively excludes the designated area from timber harvesting, I will be issuing a written order under Section 173 (Part 13) of the *Forest Act*, immediately following this decision, reducing the new Cascadia TSA AAC attributable to the BCTS Skeena Business Area by 9310 cubic metres per year. This order will remain in effect until the Kitsumkalum-Kitselas Designated Area No. 1 expires or the Kitsumkalum Treaty is ratified. Once the Kitsumkalum Treaty takes effect, the AIP lands will no longer be provincial land and will be removed from the Cascadia TSA for future AAC determinations.

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 for the Cascadia TSA 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 is 356 230 cubic metres, of which:

- 101 420 cubic metres are attributable to blocks 1, 2 and 3 of the Cascadia TSA in the BC Timber Sales Kootenay Business Area;
- 63 000 cubic metres are attributable to block 4 of the Cascadia TSA in the BC Timber Sales Okanagan-Columbia Business Area;
- 65 740 cubic metres are attributable to blocks 5, 6, 7, and 8 of the Cascadia TSA in the BC Timber Sales Cariboo-Chilcotin Business Area; and,
- 126 070 cubic metres are attributable to blocks 9, 10, and 11 of the Cascadia TSA in the BC Timber Sales Skeena Business Area.

This determination is effective January 23, 2020, 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 expect BCTS, FAIB, district staff and, where appropriate, other licensees to undertake or support the tasks and studies noted below, the particular benefits of which are described in appropriate sections of this rationale document. I recognize that the ability of all parties to undertake or support these projects is dependent on provincial priorities and available resources, including funding. However, these projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the Cascadia TSA.

1. Forest Inventory – I expect FAIB to work with BCTS to address gaps in the inventory information for block 9 (TSK);
2. Natural stand yields – I expect FAIB to work to improve the LiDAR models available to predict basal area and diameter at breast height;
3. Dead potential volume – I expect BCTS to promote and track the utilization of dead potential volume;

4. Operational adjustment factors for managed stand yields – I expect FAIB to work with BCTS to establish a Young Stand Monitoring program in the Cascadia TSA;
5. Minimum harvest criteria – I expect BCTS to monitor harvest performance in low-volume stands;
6. Harvest profile – I expect BCTS to align the species composition of the harvest with the VRI profile; and,
7. Cumulative effects framework: moose in the Kitsumkalum-Cascadia TSA – I expect BCTS to work with other resource development agencies to minimize the development of new roads and access corridors, and where possible, deactivate them. I also expect BCTS to work with the Kitsumkalum to plan and coordinate the use of herbicides and prescribed burning to enhance moose habitat and forest resources of interest to the Kitsumkalum.
8. Effectiveness monitoring: I expect BCTS to collect and compile field-base information to evaluate the effectiveness of forest practices at achieving desired outcomes for wildlife habitat, biodiversity, cultural heritage resources and forest health and to substantiate and/or improve on the forest modelling assumptions for the next AAC determination.

Diane Nicholls, RPF
Chief Forester

January 23, 2020

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to January 15, 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 tree farm licence areas, community forest agreement areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish a result set out under section 39 (2) or (3),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 10 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 10 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 10 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

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

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

(b) must give written reasons for the postponement.

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

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

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

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify that portions of the allowable annual cut are attributable to one or more of the following:

(a) different types of timber or terrain in different parts of Crown land within a timber supply area or tree farm licence area;

(a.1) different areas of Crown land within a timber supply area or tree farm licence area;

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

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

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine an allowable annual cut for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

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

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

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

(iii) silviculture treatments to be applied to the area,

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

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

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

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

(c) [Repealed 2003-31-2.]

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

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

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

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

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

(b) each tree farm licence area

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

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

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

Section 4 of the *Ministry of Forests and Range Act* (current to January 15, 2020) reads as follows:

Purposes and functions of ministry

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

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

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

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

(d) encourage a vigorous, efficient and world competitive

(i) timber processing industry, and

(ii) ranching sector

in British Columbia;

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

Appendix 3: Minister's letter of 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:

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

Telephone: (250) 387-6240
Fax: (250) 387-1040
Website: 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.

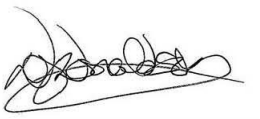
In order to ensure that AAC determinations align with government objectives to modernize land-use planning and sustainably manage B.C.'s ecosystems, rivers, lakes, watersheds, forests and old growth forests, the Timber Supply Review process should incorporate the best available information on climate 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,



Doug Donaldson
Minister

Appendix 4: Information sources used in the AAC determination

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

Legislation

- *Environment and Land Use Act*, BC Government, current to January 15, 2020;
- *Forest Act* and regulations, BC Government, current to January 15, 2020;
- *Forest and Range Practices Act* (FRPA) and regulations and amendments, BC Government, current to January 15, 2020;
- *Forest Practices Code of British Columbia Act* and regulations and amendments, BC Government, current to January 15, 2020;
- *Forestry Revitalization Act*, BC Government, current to January 15, 2020;
- *Heritage Conservation Act*, BC Government, current to January 15, 2020;
- *Interpretation Act*, BC Government, current to January 15, 2020;
- *Land Act*, BC Government, current to January 15, 2020;
- *Ministry of Forests and Range Act*, BC Government, current to January 15, 2020;
- *Oil and Gas Activities Act* and regulations and amendments, BC Government, current to current to January 15, 2020;
- *Protected Areas of British Columbia Act*, BC Government, current to January 15, 2020;
- *Species at Risk Act*, Government of Canada (S.C 2002, c29), current to January 8, 2020;
- Tree Farm Licence Management Plan Regulation, BC Government, current to January 14, 2020; and,
- *Wildlife Act*, BC Government, current to January 15, 2020.

Minister's Orders

- Cascadia and Pacific Timber Supply Area Annual Allowable Cut Allocation, January 11, 2016;
- Section 7 Order Creating the Cascadia Timber Supply Area (Tree Farm Licence 1 and Kalum Timber Supply Area), July 16, 2011;
- Section 7 Order Amending the Cascadia Timber Supply Area (Tree Farm Licences 23 and 52, Arrow, Revelstoke and Quesnel Timber Supply Areas), September 14, 2011;
- Section 7 Order Amending the Cascadia and Pacific Timber Supply Areas (Tree Farm Licence 41 and Kalum Timber Supply Area), September 14, 2011;
- Section 10 Order (Tree Farm Licence 1), July 6, 2011;
- Section 10 Order (Tree Farm Licences 23 and 52, Arrow and Revelstoke Timber Supply Areas), September 14, 2011; and,
- Section 10 Order (Tree Farm Licence 41), September 14, 2011.

Licensee Plans and Timber Supply Documents

- Coast Forest Region Operability Review, Phase 1. Prepared for: Ministry of Forests, Lands and Natural Resource Operations. Prepared by: Forsite Consultants Ltd., April 20, 2006;
- Letter from the Minister of Forests, Lands, Natural Resource Operations and Rural Development to the Chief Forester stating the Economic and Social Objectives of the Crown, October 30, 2017;
- Letter from the Minister of Forests and Range to the Chief Forester stating the Economic and Social Objectives of the Crown, July 4, 2006;

- Requested Sensitivity Analyses – Post AAC Determination Meeting Memorandum – Prepared for BC Timber Sales, Cariboo-Chilcotin, Kootenay, Okanagan-Columbia and Skeena. Prepared by: Forest Ecosystem Solutions Ltd. November 12, 2019;
- Requested Sensitivity Analyses – Post AAC Determination Meeting Memorandum – Prepared for BC Timber Sales, Cariboo-Chilcotin, Kootenay, Okanagan-Columbia and Skeena. Prepared by: Forest Ecosystem Solutions Ltd. October 24, 2019;
- Timber Supply Review Analysis Report – Cascadia TSA. Prepared for: BC Timber Sales, Cariboo-Chilcotin, Kootenay, Okanagan-Columbia and Skeena. Prepared by: Forest Ecosystem Solutions Ltd., February 2019;
- Timber Supply Review Information Package – Cascadia TSA. Prepared for: BC Timber Sales, Cariboo-Chilcotin, Kootenay, Okanagan-Columbia and Skeena. Prepared by: Forest Ecosystem Solutions Ltd., June 2018; and,
- Economic Operability [Ed. for the Cascadia TSA] Memorandum – Prepared for BC Timber Sales, Cariboo-Chilcotin, Kootenay, Okanagan-Columbia and Skeena. Prepared by: Forest Ecosystem Solutions Ltd., October 27, 2017.

Land Use, Forest Practices and other Documents

- Adapting natural resource management to climate change in the Cariboo Region: considerations for practitioners and Government staff. Prepared by: Ministry of Forests, Lands and Natural Resource Operations, February 22, 2016;
- Adapting natural resource management to climate change in the Skeena Region: considerations for practitioners and Government staff. Prepared by: Ministry of Forests, Lands and Natural Resource Operations, February 22, 2016;
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