

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

**Pacific
Timber Supply Area**

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

Effective August 10, 2017

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Chief Forester**

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Objective of this Document

This document provides an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Pacific 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 several district offices across the south and north coast, 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 TSAs and TFLs. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document.

Description of the Pacific Timber Supply Area

The Pacific TSA overlaps with five of the Ministry’s natural resource districts: Coast Mountains (DKM), North Island Central Coast (DNI), Campbell River (DCR), Sunshine Coast (DSC), and South Island (DSI). The TSA consists of 30 timber supply blocks (‘supply blocks’) on Vancouver Island, the Sunshine Coast, the Mainland Coast and Douglas Channel, each ranging in size from 76 hectares to over 400 000 hectares. The total area of the TSA is 698 041 hectares spread over four BCTS business areas, which are the Strait of Georgia (TSG, encompassing Vancouver Island from Campbell River area south, and portions of the discovery islands and the adjacent mainland), Seaward-Tlasta (TST, located in northern Vancouver Island and in the Central Coast area of the mainland), Skeena (TSK, located around Terrace and north in the North-Western portion of BC) and Chinook (TCH, extending from the Sunshine Coast to Chilliwack in the BC Lower Mainland) business areas.

In March 2016, BCTS transferred the management of the timber supply blocks on the Sunshine Coast (supply blocks 21, 22, and 23) from the TSG business area to the TCH business area. However, for the purpose of the timber supply analysis and this rationale document, these blocks are assumed to be among the supply blocks in the TSG Business Area.

The TSA is largely within the Coastal Western Hemlock (CWH) biogeoclimatic zone, with smaller area within the Mountain Hemlock (MH) and Coastal Mountain-Heather Alpine zones. Dominant tree species in the forests are western hemlock, western redcedar and Douglas-fir, with smaller components of amabilis fir, sitka spruce, big-leaf maple and red alder. The area provides rich habitat for wildlife and fish.

Many of the larger coastal towns outside the BC Lower Mainland are in or near the TSA. Many smaller coastal communities in the Sunshine Coast, North Island, Central Coast and Coast Mountain areas have significant dependence on forest related industries, as well as public sector and tourism. Thirty First Nations have traditional territory that overlaps at least one of the 30 blocks of the Pacific TSA. At least one of the Pacific TSA blocks overlaps with

the Maa-nulth Final Agreement Areas. The TSA also overlaps with the traditional territories of five of the six signatory Nānwākolas Strategic Engagement (SEA) First Nations.

A portion of the Pacific TSA, totalling 56 605 hectares, is located within the Great Bear Rainforest (GBR) forest management area that was designated under Section 6 of the *Great Bear Rainforest (Forest Management) Act* in January 2017. This area is managed under the Great Bear Rainforest Land Use Order using Ecosystem Based Management (EBM) practices.

History of the AAC for the Pacific TSA

The Pacific TSA was established in July 2009 from an amalgamation of areas removed from nine TFLs. These areas were taken back by the Province through the *Forestry Revitalization Act* (Bill 28, 2003) to support BCTS and the establishment of the market pricing system (MPS) for setting stumpage rates. The areas taken back were delineated as 30 supply blocks for the Pacific TSA, with boundaries determined through the Bill 28 process.

At its creation in 2009, the AAC for the Pacific TSA was 958 154 cubic metres. This original AAC was determined by prorating the AAC of the contributing TFLs by the proportion of timber harvesting land base that was transferred to the Pacific TSA. Since 2009, the AAC has been adjusted several times as blocks were added and an area was removed to create a First Nations Woodland licence. The current AAC for the Pacific TSA was set on January 1, 2017, by regulation under the *Great Bear Rainforest (Forest Management) Act*. The regulation set the AAC for the GBR part of the TSA at 62 400 cubic metres and the AAC for the non-GBR part of the TSA at 1 279 700 cubic metres.

Over 95 percent of the harvest is allocated to BCTS, with the remaining either apportioned to or allocated for First Nations tenures.

With the establishment of the GBR forest management area, I have the authority to determine the AAC and specify AAC partitions for the non-GBR part of the Pacific TSA. For this reason, the contribution of the GBR part of the Pacific TSA has been excluded from the base case and from my considerations in this document.

New AAC determination

Effective August 10, 2017, the new AAC for the non-GBR part of the Pacific TSA is 803 300 cubic metres. Within this AAC there is a partition of 730 100 cubic metres that is attributable to the areas outside supply blocks 28 and 29 and a partition of 615 100 cubic metres that is attributable to the area outside of supply blocks 28 and 29 and is within the area mapped as timber harvesting land base for base case in the 2016 Timber Supply Analysis Report– Pacific TSA.

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

The AAC for the GBR part of the Pacific TSA is as specified in the Great Bear Rainforest (Forest Management) Act Regulation.

Information sources used in the AAC determination

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

- Atmospheric Benefit Sharing Agreement, between British Columbia and the Nanwakolas First Nations, March 23, 2012;
- B.C. Timber Sales, Strait of Georgia, 2016. Pacific Timber Supply Area Socio-Economic Assessment;
- B.C. Timber Sales, Strait of Georgia, 2015. Pacific TSA Supply Block 7 Vegetation Resource inventory Statistical Adjustment. Prepared by: Forest Ecosystem Solutions Ltd.;
- B.C. Timber Sales, Strait of Georgia, 2016. Timber Supply Review Analysis Report – Pacific TSA Prepared by: Forest Ecosystem Solutions Ltd.;
- B.C. Timber Sales, Strait of Georgia, 2016. Timber Supply Review Information Package – Pacific TSA Prepared by: Forest Ecosystem Solutions Ltd.;
- B.C. Timber Sales, Strait of Georgia, 2015. Economic Operability Assessment Analysis Report – Pacific TSA, Prepared by: Forest Ecosystem Solutions Ltd. ;
- British Columbia Ministry Agriculture and Lands, 2005. Sustainable Resource Management Plan, Biodiversity Chapter for the Upper Nimpkish Landscape Unit;
- British Columbia Ministry of Agriculture and Lands 2010 Land Use Objectives for Old Growth Management Areas with the Tsitika, Naka, Adam-Eve, White, and Salmon Landscape Units situated on Northern Vancouver Island within the Campbell River Forest District;
- British Columbia Ministry of Agriculture and Lands 2010 Land Use Objectives for Old Growth Management Areas with the Nahwitti, Tsulquate, and Marble Landscape Units situated on Northern Vancouver Island within the North Island – Central Coast Forest District;
- British Columbia Ministry of Agriculture and Lands, Integrated Land Management Agency, Coast Region, 2005. Sustainable Resource Management Plan Biodiversity Chapter for Sproat Lake Landscape Unit;
- British Columbia Ministry of Agriculture and Lands, 2009, Land Use Objectives for the Renfrew Sustainable Resource Management Plan;
- British Columbia Ministry of Agriculture and Lands, 2006. Kalum Sustainable Resource Management Plan Integrated Land Management Bureau;
- British Columbia Ministry of Agriculture and Lands, 2006. Kowesas Sustainable Resource Management Plan Integrated Land Management Bureau;
- British Columbia Ministry of Forests, Lands and Natural Resource Operations, 2016. Current inventory information from Forest Analysis and Inventory Branch;
- British Columbia Ministry of Forests, Lands and Natural Resource Operations, 2013. Central North Coast Order;
- British Columbia Ministry of Forests, Lands and Natural Resource Operations, 2013. South-Central Coast Order;

- British Columbia Ministry of Forests, Lands and Natural Resource Operations, 2012, Brittain Landscape Unit Sustainable Resources Management Plan;
- British Columbia Ministry of Forests, Lands and Natural Resource Operations, 2016. Great Bear Rain Forest Order;
- British Columbia Ministry of Sustainable Resource Management, 2004. Biodiversity Chapter for the San Josef Landscape Unit;
- British Columbia Ministry of Sustainable Resource Management, 2003. Sayward Landscape Unit Plan;
- British Columbia Ministry of Sustainable Resource Management, 2002. Kalum Land and Resource Management Plan;
- Clayoquot Sound Technical Planning Committee, 2006, Watershed Planning in Clayoquot Sound, Vol 7: Upper Kennedy Watershed Plan;
- Coast Area Forest Health Aerial Overview Survey, 2016;
- Coast Forest Conservation Initiative, 2015. Joint Solutions Project, http://www.coastforestconservationinitiative.com/_About/joint_solutions.html;
- District and B.C. Timber Sales staff evaluations of forest practices relating to roads, riparian areas, unstable and potentially unstable terrain, forest regeneration, and silvicultural systems;
- First Nations Consultation Summary Pacific TSA, Ministry of Forests, Lands and Natural Resource Operations, Consultation Report and Tracking System – TFL 18 MP # 11 and TSR, July 2016;
- Forest Ecosystems Solutions Ltd., 2016. Memo on Outstanding Issues from the Nanwakolas Meeting;
- Forest Ecosystems Solutions Ltd., 2016. Memo on Alternate Harvest Flows;
- Forest Ecosystems Solutions Ltd., 2016. Memo on Additional Timber Supply Runs for the Pacific TSA;
- Forest Ecosystems Solutions Ltd., 2016. Memo on Additional Timber Supply Runs for the Pacific TSA;
- Forsite, 2009. Mid Coast Timber Supply Area Timber Supply Review #3, Draft Data Package, Version 1.0;
- Letter from the Minister of Forests and Range to the chief forester, October 27, 2010, regarding the Crown's economic and social objectives and mid-term timber supply in areas affected by the mountain pine beetle;
- Letter from the Minister of Forests and Range to the chief forester stating the economic and social objectives of the Crown. July 4, 2006;
- Letter from the Minister of Forests, Lands and Natural Resource Operations to the chief forester stating the economic and social objectives of the government for signatory First Nations of the Nanwakolas Reconciliation Protocol. April 12, 2013;
- Matt Kurowski, M.Sc., EIT, Researcher, FPIInnovations and François Gougeon, Ph.D., Research Scientist, Canadian Forest Service, November 2016. Using LiDAR and

orthophotos to quantify forest regeneration along active and non-active resource roads, unpublished draft;

- Nanwakolas First Nations Letter of Understanding, April 16, 2013;
- Nanwakolas Reconciliation Protocol – Appendix 2 Schedule B (Forestry Schedule), Shared Decision Making Process, April 16, 2013;
- Nanwakolas/British Columbia, Amending Agreement of the Nanwakolas Reconciliation Protocol Spring 2015, May 14, 2015Nanwakolas Reconciliation Protocol, July 29, 2011;
- Nanwakolas/British Columbia Framework Agreement, December 16, 2009;
- Price Huber & Associates Inc., 2010. Licensee Benchmark Logging Cost Report;
- Price Huber & Associates Inc., 2015. Licensee Benchmark Logging Cost Update;
- Province of British Columbia, *Wildlife Act*, B.C. Government, current to June 16, 2017;
- Province of British Columbia. *Ministry of Forests and Range Act*, B.C. Government, current to June 16, 2017;
- Province of British Columbia, *Heritage Conservation Act*, B.C. Government current to June 16, 2017;
- Province of British Columbia, *Parks and Protected Areas Statutes Amendment Act*, B.C. Government current to June 16, 2017;
- Province of British Columbia, *Oil and Gas Activities Act* and regulations and amendments, B.C. Government current to June 16, 2017;
- Province of British Columbia, *Forestry Revitalization Act*, B.C. Government current to June 16, 2017;
- Province of British Columbia, *Great Bear Rainforest (Forest Management) Act* and Regulation, B.C. Government, current to January 1, 2017;
- Province of British Columbia, *Interpretation Act*, B.C. Government current to August 17, 2016;
- Province of British Columbia, *Land Act*, B.C. Government current to June 16, 2017;
- Province of British Columbia, *Forest Practices Code of British Columbia Act*, B.C. Government, current to June 16, 2017, and regulations and amendments;
- Province of British Columbia, *Species at Risk Act*, Government of Canada (S.C. 2002, c29) current to August 15, 2016;
- Province of British Columbia, *Environment and Land Use Act*, B.C. Government current to June 16, 2017;
- Province of British Columbia, *Forest Act* and regulations, B.C. Government, current to June 16, 2017;
- Province of British Columbia, *Forest and Range Practices Act* (FRPA) and regulations and amendments, B.C. Government, current to June 16, 2017;
- Province of British Columbia, 2000. Vancouver Island Land Use Plan Higher Level Plan Order;
- Province of British Columbia, 1993. Clayoquot Sound Land Use Decision;

- Province of British Columbia, 2010. Updated Procedures for Meeting Legal Obligations when Consulting First Nations;
- Sunshine Coast Forest District Landscape Unit Planning, 2000, Bunster Landscape Unit Plan;
- Sunshine Coast Forest District Landscape Unit Planning, 2002, Lois Landscape Unit Plan;
- Consideration of Information Required by Section 8 of the Forest Act for the Pacific TSA presented to the Chief Forester by Ministry of Forests, Lands and Natural Resource Operations at a meeting held in Victoria, January 19 and 20, 2017;
- The Haisla Resource and Culturally Significant Sites within the NCLRMP, KLRMP and CCLRM, undated. unpublished manuscript provided by Haisla Nation, Lands and Resources.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester, in determining AACs, to consider biophysical, social and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs of inventory and growth and yield data. These are concerned primarily with biophysical factors – such as the rate of timber growth and the definition of the land base considered available for timber harvesting – and with management practices.

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

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

In determining this AAC for the Pacific TSA, I have considered known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

Guiding principles for AAC determinations

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining the AACs for timber supply areas and tree farm licences.

Given the large number of periodic AAC determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in addressing relevant factors associated with AAC determinations. In order to make my approach in these matters explicit, I have considered and adopted the following body of guiding principles, which have been developed over time by BC's chief foresters and deputy chief foresters. However, in any specific circumstance in a determination

where I consider it necessary to deviate from these principles, I will explain my reasoning in detail.

When considering the factors required under Section 8, I am also mindful of my obligation as a steward of the forests of British Columbia, of the mandate of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest Act* and *Forest and Range Practices Act* (FRPA).

Integrated decision making

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

Information uncertainty

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

Two important ways of dealing with this uncertainty are:

- (i) managing risks by evaluating the significance of specific uncertainties associated with the current information and assessing the various potential current and future, social, economic and environmental risks associated with a range of possible AACs; and
- (ii) re-determining AACs frequently, in cases where projections of short-term timber supply are not stable, to ensure they incorporate current information and knowledge.

In considering the various factors that Section 8 of the Forest Act requires the chief forester to take into account in determining AACs, it is important to reflect those factors, as closely as possible, that are a reasonable extrapolation of current practices. It is not appropriate to base decisions on proposed or potential practices that could affect the timber supply but are not substantiated by demonstrated performance or are beyond current legal requirements.

In many areas, the timber supply implications of some legislative provisions remain uncertain, particularly when considered in combination with other factors. In each AAC determination, this uncertainty is taken into account to the extent possible in the context of the best available information.

It is not appropriate to speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government, nor is it possible at this time to speculate about the possible effect on timber supply that could result from possible eventual legal proof of aboriginal title. However, where specific protected areas, conservancies, or similar areas have been designated by legislation or by order in council, these areas are deducted from the timber harvesting land base (THLB) and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting resource management objectives such as for biodiversity.

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to fully analyse and account for the consequent timber supply impacts in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, further detailed planning or legal designations such as those provided for under the *Land Act* and FRPA. In cases where there is a clear intent by government to implement these decisions that have not yet been finalized, I will consider information that is relevant to the decision in a manner that is appropriate to the circumstance. The requirement for regular AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

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

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

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

Climate change

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

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

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

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

First Nations

Established (declared) Aboriginal title lands and other areas, such as Treaty Settlement Lands or Indian Reserves, are not provincial Crown land. Consequently, the timber on these lands does not contribute to the AAC of the timber supply area or tree farm licence with which they overlap. For other areas, where Aboriginal title has not been legally proven, the Crown has a constitutional obligation to consult with First Nations regarding their asserted Aboriginal rights and/or title (Aboriginal interests) in a manner proportional to the strength of their Aboriginal interests and the degree to which the decision may impact these interests. In this regard, full consideration will be given to:

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

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

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

The role of the base case

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

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

rates of decline or increase, and potential trade-offs between short- and long-term harvest levels.

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

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

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

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

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

Base case for the Pacific TSA

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

The base case forecast projected an orderly transition from the highest possible short-term harvest level to the highest possible even flow long-term harvest level, while meeting all non-timber forest objectives. As well, periodic harvest level declines during the transition from the short-term to the long-term level were constrained to be no more than ten percent of the harvest level in any one decade.

As noted earlier, the contribution of the GBR portion of the Pacific TSA was excluded from the base case forecast.

In the base case, an initial harvest level of 688 245 cubic metres per year was maintained for ten years. The harvest level was then projected to decline by 8.5 percent to 630 080 cubic metres per year, where it was maintained for ten years before declining by 2.8 percent at year 21 to the long-term harvest level of 612 250 cubic metres per year. This final level was maintained for the rest of the forecast period.

A forecast which partitioned the harvest by BCTS business area was also generated in the analysis. This forecast showed that the first decade harvest level can be attributed to the BCTS business areas as follows: 615 045 cubic metres from the TST and TSG business areas and 73 200 cubic metres from the TSK Business Area.

In addition to the base case forecast, a number of alternative forecasts and sensitivity analyses were generated during the analyses. These forecasts have been helpful as I made specific considerations and reasoning in my determination as documented in the following sections.

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

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

I have reviewed the information for all of the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case appropriately represents current management or the best available information, and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed in Table 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 leading to my conclusions.

Table 1. List of factors accepted as modelled

Forest Act section and description	Factors accepted as modelled
8(8)(a)(i) Composition of the forest and its expected rate of growth	<ul style="list-style-type: none"> • Total area within the Pacific TSA • Non-forest, non-productive forest, non-commercial brush • Parks and protected areas • Ungulate winter ranges • Recreation reductions • Riparian reserve and management zones • Wildlife tree patches • Site productivity assignments • Aggregation procedures • Natural stand yields
8(8)(a)(ii) Expected time that it will take the forest to become re-established following denudation	<ul style="list-style-type: none"> • Backlog and current non-stocked areas
8(8)(a)(iii) Silvicultural treatments to be applied	<ul style="list-style-type: none"> • Silviculture systems
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	<ul style="list-style-type: none"> • Decay, waste and breakage for unmanaged stands • Timber utilization
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	<ul style="list-style-type: none"> • Objectives for adjacent cutblock green-up • Objectives for watersheds • Objectives for stand level biodiversity
8(8)(b) The short and long term implications to British Columbia of alternative rates of timber harvesting from the area	<ul style="list-style-type: none"> • Alternative rates of harvest • Cumulative effects

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 non-GBR part of the Pacific TSA is 641 436 hectares. Of this total area, 90 622 hectares are deemed to be available as THLB after deductions are applied for factors noted in Table 1 above and in factors discussed below

As part of the process used to define the THLB, a series of deductions was made from the Crown forest management 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 accept that the approach used to determine the THLB for the Pacific TSA base case was appropriate.

- existing and future roads, trails and landings

In the derivation of the THLB, areas are excluded to account for access structures (i.e., roads) that will never regenerate forest. Separate estimates are made to account for existing roads and for future roads.

The landbase of the Pacific TSA has a varied operational history, as the blocks that comprise the TSA originated from several TFLs that were held by several different licensees. While preparing the information for the analysis, roads were classified into several broad types (i.e., highway, mainline, branch and spur) and staff from each BCTS business area provided an average road width for each road type within their business area. The line work for these existing roads was mapped and buffered by these average widths to create a single road map layer, and the area occupied by roads was deducted from the forested area during the derivation of the THLB. The net area reduction for existing roads after accounting for overlaps with other exclusions was 3831 hectares.

To account for future roads, a network of the roads expected to be required to access the unroaded parts of the TSA was generated by BCTS operations staff. Any existing roads that had been semi-deactivated (and not accounted for as existing roads) were also included in this network. Permanently deactivated roads were included on a case-by-case basis following an evaluation of whether a deactivated road was on unstable or slide-prone terrain or in a location where upgrading would not be possible under current practice regulations. BCTS stated that a general assumption applied by their operations staff was that if an area was roaded once, it could be roaded again. No reduction was applied to account for future spur roads as it was assumed that the area of in-block roads will remain constant over time as existing spur roads are reforested, and new ones are built.

The same widths were applied to future road types as for existing roads. The total reduction applied to account for expected future roads was 863 hectares.

Western Forest Products (WFP) and International Forest Products (Interfor) commented on the data package that “there is significant evidence, including recent use of LiDAR datasets that support the premise that trees grow on roads such that at rotation age the road is indistinguishable from the rest of the land base.” Both companies requested that the

assumptions for future road netdowns be revisited to re-determine what the perpetual amount for road netdown should be over time.

In September 2016, Interfor provided me with a draft report titled *Using LiDAR and orthophotos to quantify forest regeneration* prepared by FPInnovations (2016). This report provides estimates of the regeneration productivity surrounding older active and non-active roads in the Elk Bay area of the Strathcona TSA using information derived from LiDAR and orthophotos. The results indicate that when hardwood species are not considered merchantable—as they were in the Pacific TSA base case—the average road width loss is 5.6 metres for active roads and 6.3 metres for non-active roads. By comparison, the average road width loss for non-mainline roads assumed in the Pacific TSA base case was about 10 metres.

WFP and Interfor also commented that significant area in the TSA is assumed to be without roads, and that some existing older roads may have been omitted in the analysis. BCTS states they are confident that the roads have been thoroughly reviewed by operations staff and the estimates are based upon the best available and most current knowledge. In response to the input from the two companies, BCTS reviewed specific examples identified in the comments and in each case found that either the actual road networks used in the base case provided coverage over the area in question or that terrain issues presented significant obstacles to road construction.

In April 2017, I flew over portions of the TSA located on northern Vancouver Island and islands along the Johnstone Strait in order to further inform my assessment of the base case and base case assumptions. At that time, I noted a small number of areas where existing roads could be extended beyond what was assumed in the base case, potentially enabling conventional harvesting operations for stands in areas assumed to be helicopter operable.

Having reviewed the information available regarding estimates for both existing and future roads, I have made the following conclusions. I am aware that the preliminary findings from the FPInnovations 2016 report support the premise that trees grow on roads, thus decreasing the lost productive forest area over time. However, I note that this growth is generally insignificant on maintained mainline roads and it is also uncertain to what degree trees growing on roads will meet requirements for merchantable timber when the roaded area is harvested in the future. Despite the uncertainty, I agree that there is evidence to support the premise that an amount of merchantable tree growth occurs on roadways, which suggests an unquantified underestimation of mid- to long-term timber supply in the base case projection, expected to be small as there is uncertainty as to what extent this growth will contribute to the future timber supply.

In addition, I believe that the future road network assumed in the base case has potentially been underestimated. Although the implications of this underestimation are significantly greater with respect to the economic operability (which I will discuss in the next section), I note it also has a small bearing on the THLB reduction applied for future roads.

Considering the net impact of the above two alterations from the base case assumptions with respect to roads, it is my assessment that timber supply has likely been underestimated by a small, unquantified amount in the mid term and potentially into the long term. I will discuss my consideration of this further in “**Reasons for Decision**”.

I believe that further work using LiDAR or other methodologies would be beneficial to improve the estimates for road widths and longer term loss of growing space for merchantable trees along roads in the Pacific TSA, and I have included instructions on this under “**Implementation**”.

- *inaccessible areas*

The ability of harvesting operations to access areas using the existing or future road network is a key consideration in the determining the amount of accessible-conventional, accessible-helicopter and inaccessible area in the TSA.

For the analysis, BCTS determined the area within the TSA that could be accessed from existing and future roads by extending a buffer area out from each existing and future road. The buffer distance was equal to the anticipated yarding distance which varied by supply block based on local terrain conditions and past practices. For supply blocks with more rugged terrain, the assumed yarding distance was 200 metres. In supply blocks with less mountainous terrain, the assumed yarding distance was 300 metres.

BCTS determined the area that could be accessed using helicopter harvesting systems (either land-based or water-based) by buffering all roads and coastlines by an assumed helicopter yarding distance of 2000 metres. Areas located within this buffer zone that were not already within the road-accessible buffer zone were classified as helicopter-accessible. In the base case, all area that is located more than 2000 metres from a road or the coastline was considered inaccessible.

The mapped road network was reviewed by BCTS operations staff and corrections were made to the classification of some areas based on knowledge of local conditions.

The total area assumed to be inaccessible in the TSA was 240 413 hectares. The majority of this inaccessible area is in blocks within the TSK Business Area.

The Coast Forest Products Association (CFPA) and Interfor commented that the BCTS road network used for the analysis lacked sufficient detail as to the location of secondary roads. As well, they noted that there is evidence where primary roads could be extended to access more conventional volume, and that permanently deactivated roads were not considered in the road plan. CFPA also suggested the assumed road yarding distance for conventional harvesting be revised to 400 metres—a value they suggested was a reasonable surrogate to adjusting the road plan in order to address the apparent lack of secondary roads.

In response to these comments, BCTS staff note that secondary and spur roads were included in the road network only where operations staff deemed them critical to the determination of the helicopter and conventional split in the land base.

Interfor also commented that a significant amount of land may have been unnecessarily excluded due to the yarding distance assumed for conventional harvest areas, stating that “areas of steep slope should not be a criterion for constraining yarding distance”. BCTS staff noted that their initial assumption of using 300 metres for all supply blocks was revised to 200 metres in some areas to reflect past harvesting practices.

I have considered the information regarding the classification of inaccessible areas in the Pacific TSA presented by BCTS together with the comments received during the public review. As noted under “*existing and future roads*”, permanently deactivated roads were

included on a case-by-case basis, in consideration of whether the road was on unstable or slide-prone terrain or in a location where upgrading was not possible. Overall, I find the methodology and assumptions applied by BCTS for classifying the inaccessible land base to be reasonable, and I am aware it included reviews by BCTS operations staff. However, I agree with comments suggesting that some uncertainty exists with respect to the projected future road coverage, particularly in areas of close proximity to deactivated roads or with potentially unstable terrain. As I noted previously, I observed some areas during my overflight of the TSA where it appeared future roads could be extended further than was assumed in the base case.

The extent of the future road network affects the distinction between the conventionally accessible and helicopter accessible land base, and thus contains implications for the economic operability assessment. Based on my review of the analysis methods, the comments received and observations made in the TSA, I conclude that the inaccessible land base may be overstated in the base case, although to an extent that is not certain. I will discuss my consideration of this in combination with other factors in my “**Reasons for Decision**”.

- economic operability

In 2015, Forest Ecosystem Solutions Ltd., on behalf of BCTS, completed an Economic Operability Assessment (EOA) for the Pacific TSA. This was a strategic, landscape-level analysis that involved assessing the net financial value (defined as the value of the timber minus the delivered wood cost) for each available stand in the TSA.

The assessment was applied independently to the road-accessible and helicopter-accessible parts of the TSA. Areas that were unlogged and road-accessible were classified as suitable for conventional harvest. These areas were then further classified as either cable-based conventional harvest or ground-based conventional harvest, depending on slope condition and proximity to roads. Generally, if the slope was less than or equal to 40 percent and any part of the area was within 20 metres from the nearest road, the harvest method was classified as ground-based conventional. Otherwise the area was considered cable-based. All helicopter-accessible areas were classified as suitable for helicopter harvesting.

BCTS operations staff reviewed the harvest system classification and in some cases made adjustments to the classification, after considering local area size and terrain conditions.

The harvesting cost (per cubic metre) for each stand in conventional (subdivided as cable or ground) and helicopter harvestable areas were estimated based on information gathered for a report, *Licensee Benchmark Logging Cost Project (2015)*, produced by Price Huber & Associates Inc. This report estimates logging costs, which included all costs from tree-falling to delivery, including silviculture, engineering costs and brokerage fees. Estimates were derived from a survey of timber sale licensees across the TSK Business area and in other parts of the TSA. Timber value was calculated for each stand based on its species distribution, estimated grade distribution and historical Vancouver Log Market (VLM) prices for the period from 2005 to 2014. The average log price in this period was assumed for stands in the conventional harvest area and the highest historic log prices were applied to stands in the helicopter accessible area. Log grade distributions for major tree species were derived from scale data collected in the Pacific TSA over the period from 2005 to 2014. The scale data only included old-growth timber as BCTS reported that information on second-growth timber was insufficient. The value for species—except for cedar and cypress—included an export

premium that was based on the proportion of exported volume from the Pacific TSA in the period 2008 to 2014 and an average export premium of \$30 per cubic metre.

Profit before road building costs was calculated for each stand by subtracting estimated harvest cost—before road building—from estimated timber value. Each proposed road was then assessed as to whether the total profit from the conventional harvestable stands that it was assumed to access would cover the road construction costs. Stands accessed from existing and deactivated roads (with some exceptions in the TSK Business Area) were considered economic. All profitable stands accessed by existing and deactivated roads and by profitable proposed roads were deemed to be economically operable. In the conventional harvest area, previously harvested stands less than 50 years old were considered economic regardless of net value, and in the helicopter accessible area, previously-harvested stands less than 50 years old and with at least 30 percent Douglas-fir, western redcedar or cypress (yellow cedar) were considered economic regardless of net value.

Once road costs were covered, the economic operable land base was expanded through a modelling exercise that sought to find the largest profitable land base that could be achieved by combining marginally-unprofitable stands with a profitable stand (known as “blending”). This blending of stands was done within supply block groups, called “woodsheds”, to reflect harvest planning practices used in current operations. Blending was also done separately for helicopter and conventional stands, (i.e., there was no blending of cut blocks between conventional harvest areas and helicopter harvest areas). Results were reviewed by BCTS operations staff and changes were made to improve alignment with local knowledge and experience.

The result of this EOA was a spatial layer identifying areas of the accessible land base that were deemed economic for harvesting. The remaining uneconomic area, which covered 122 094 hectares, was excluded during the derivation of the THLB in the base case.

The result of the EOA has significant implications for the size of the THLB and therefore, the projected available timber supply for the Pacific TSA. For this reason, several sensitivity analyses were completed to assess the implications of altering various assumptions in the EOA.

The first sensitivity analysis was conducted to assess the effects of alternative VLM log price scenarios and alternative accessibility assumptions. Application of high historic prices, in place of average prices, increased the size of the THLB by 5 percent—with the increase occurring entirely within the conventional land base. A forecast showed that, with the above changes, harvest levels could be increased by 8 percent in the short term and 5 percent in the long term, relative to the base case forecast.

A second sensitivity analysis considered all conventional accessible areas to be economically operable. This change increased the THLB by 7.5 percent, with most of the increase occurring in the TSK Business Area. The larger THLB allowed harvest levels in the forecast to be increased by 11 percent in the short term and 7 percent in the long term, relative to the base case. All of the increase in the short term and approximately 80 percent of the increase over the long term occurred in the TSK Business Area.

A third sensitivity analysis assessed the impact if all physically accessible harvest areas across all business areas were economically operable. This change increased the THLB by 65

percent with most of the increase occurring in the helicopter land base, of which two-thirds was in the TSK Business Area. The larger THLB allowed harvest levels in the forecast to be increased by 70 percent in the short term and 65 percent in the long term, relative to the base case. In the short term, over 80 percent of the increased harvest was from the TSK business area and mostly in the helicopter accessible areas. In the long term, additional volume was also harvested from the TSG Business Area, though a lesser amount than from the TSK Business Area.

Finally, a fourth sensitivity analysis was generated which considered all physically accessible harvest areas across the TST and TSG business areas to be economically operable, while in the TSK business area only the base case THLB was considered operable. This configuration increased the size of the THLB by almost 19 percent. The short-term harvest forecast level increased by 115 000 cubic metres, or 16.7 percent, and the long-term harvest level increased by 103 000 cubic metres. All of the additional volume in the short term was from helicopter-operable areas, mostly in the TSG Business Area. In the long term, additional volume was also obtained from the TST Business Area.

Numerous comments about the EOA were received from Interfor, WFP and CFPA. In summary, these comments suggested that the projected road network, harvesting costs and timber value estimates applied in the EOA resulted in the excessive exclusion of land from the THLB. They suggested that the EOA results are contrary to experience, expectation and standards of operators in several other coastal management units.

With respect to the road network, Interfor, WFP and CFPA all expressed concern that the BCTS proposed road network, which they view as a primary driver in the EOA, omitted some existing roads, lacked sufficient secondary roads or did not project new roads in areas they believe were roadable, which resulted in a significant area of the TSA being left unroaded over the harvest forecast period. In their written responses, the companies pointed to three places in particular where this occurred—in supply blocks 11, 19 and 29.

As discussed earlier under “*existing and future roads, trails and landings*” and “*inaccessible areas*”, BCTS responded to the concerns raised about projected roads stating that they are confident that the projected road network, which was thoroughly reviewed by BCTS operations staff, reflects the best available and most current knowledge.

BCTS also reviewed the examples identified in the industry response letters and in each case found that the actual road networks provided coverage over the area in question or that terrain issues presented significant obstacles to road construction. In the Block 11 example (Harbledown Island), BCTS noted that the excluded area was deemed to be roadable and assessed as conventional harvest area but was excluded based on the cost-value analysis. In the Block 19 example (Kaikash), BCTS indicated that area is challenging in terms of its capacity to be roaded and that the area described is very steep in the upper reaches and the roads that access the top bench of the block cannot be extended (due to steep terrain) down the sidehill, and further that access from the ocean was not viable due to terrain issues and visual objectives. In the Block 29 example, BCTS responded that the economic operability assessment included all previously logged blocks as economic except in the case that they are located in class V terrain. BCTS reported that the blocks identified in the industry letter are located in class V terrain.

With respect to harvesting costs, Interfor, WFP and the CFPA all expressed concern that cost estimates derived from timber sale licences as reported by Price Huber & Associates Inc., are not necessarily applicable for determining economic operability. They commented “While it may be useful to identify what areas may be deemed uneconomical due to current BCTS policy we would suggest excluding these areas from the timber supply is not an appropriate course of action as the ability to replace this lost timber will be extremely difficult.” The industry commenters also considered the costs used in the EOA, particularly the helicopter phase cost, to be significantly higher than costs faced by licensees in other areas of the coast. They also suggested some costs applied such as log brokerage fees and remote operator additive fees should not have been applied.

BCTS replied that the cost survey was completed by the independent expert, who reviewed costs associated with average efficient BCTS licensee (ranging from small operators to major licensee bidders). Both log brokerage fees and the remote-location cost additive were included in the cost structure. Work was completed to ensure the costs reflect average BCTS timber sales with outputs verified by operations staff and cost/value changes tested through sensitivity analysis.

With respect to timber value, the industry letter suggested that, for the base case forecast, high market prices should have been applied to both conventional and helicopter harvest area (it was applied only to the helicopter area in the base case). They reasoned that since high prices are achieved during the market cycle, it does not make sense to exclude areas based on average pricing assumptions. They stated that “the variability in log values is too great to start excluding stands that fall within the variation of historic pricing”. Industry also suggested that the export premium assumed in the EOA should have been higher.

BCTS replied that an assumed timber supply based on high market prices would only be achievable during the relatively brief period when markets were at the top of the multi-year price cycle. The EOA was intended to capture what is generally harvested in average market conditions. They replied that export values used were reviewed with the Ministry experts and the best available information was reviewed to determine export trends.

The CFPA suggested that an industry scenario be generated to examine the timber supply under the following modified assumptions: apply the THLB created before the *Forestry Revitalization Act* (Bill 28, 2003), apply a minimum harvest age criteria based on 95 percent of mean annual increment (MAI) for stands and remove minimum entry by block criteria and report on harvest by geographic area, making note of harvest patterns by ocular assessment–20-year plan approach.

In response, BCTS provided me with a memo dated February 1, 2017, which describes a timber supply scenario which closely matches the CFPA request. In the scenario, the economically operable land base was increased by considering all accessible areas to be economic, harvestable ages were restricted to greater than the age at which stands achieve 95 percent MAI and woodshed constraints were removed. The changed assumptions increased the THLB by nearly 70 percent, with most of the increase occurring in the TSK Business Area. The larger THLB allowed harvest levels in the forecast to increase by 70 percent in the short term and 65 percent in the long term, relative to the base case. I note that the projected supply under this scenario is very similar to the “all economically operable scenario”

presented in Section 5.5.3 of the September 2016 analysis report for the Pacific TSA, and described above.

The Truck Loggers Association, in a letter to me, requested that I consider that the market may find solutions to access parts of the THLB that are currently regarded by BCTS as uneconomic, should those areas be presented in a manner other than conventional timber sales through BCTS.

The Catalyst Paper Corporation, in a letter to the Deputy Minister, described how the company in the past has competed effectively due, in part, to affordable power and fibre supplies. However, the company now sees these historic advantages being eroded as the provincial timber supply declines. They believe the situation warrants a thorough analysis of the economic impacts of a significant reduction of THLB in the region.

I have considered the information presented regarding the EOA, and the resulting assumed economically operable land base in the Pacific TSA. My review of the methods and assumptions applied by BCTS in the EOA leads me to conclude that it provides a credible assessment of the economically viable timber supply available to BCTS within the Pacific TSA given current objectives and procedures of the timber sales programs carried out in the TSA. However, I acknowledge the concerns and comments provided in the extensive public input and discussed these concerns in detail with Ministry staff. During my April 2017 overflight of portions of the TSA, I noted the potential for a more extensive future road network than assumed in the base case, which has implications for the operable land base assumed to be economic in the TSA.

In consideration of other coastal industry input, I agree with the assessment of industry that the costs incurred by an average efficient timber sales operator in the TSA may be higher than those of some major coastal companies operating outside of the Pacific TSA. I also agree with comments that the exclusion of marginally-uneconomic stands in the EOA, which applied average market prices for conventional harvest areas, may underestimate the operable timber supply if log values exceed the average historic value over the last 10 years. I acknowledge the uncertainty with respect to the assumed grade distribution of second-growth stands, which was based on old-growth grades. However, I believe the effect of this is likely a modest overestimation of the value of existing second growth stands established before 1965.

In weighing the above points, I conclude that there is a low- to moderate-level of uncertainty with respect to the size of the operable land base determined in the EOA, within both the conventionally-harvestable and helicopter-harvestable areas. This uncertainty originates from multiple factors, though I believe the harvesting cost and log value assumptions to be the most significant. Given this uncertainty, my determination must, to the best degree possible, guard against making an unnecessary reduction at the current time to the AAC. Should improvements in operator efficiency or market conditions occur, or government policy change (that increases the likelihood of harvesting in stands assessed in the analysis as not economically operable), the timber supply would prove to be greater over time than assumed in the base case.

At the same time, my determination must also ensure that any adjustment made to the base case timber supply to account for future harvesting in stands that were excluded from the THLB as not-economic does not lead to an unsustainable concentration of harvesting in the more economic portions of the TSA. One means for achieving this is to allow for an AAC

above the base case harvest level, at a level that promotes activity in potentially-economic stands located outside the base case THLB, while also specifying an AAC partition that does not permit the portion of AAC attributed to potentially-economic stands located outside the THLB to be harvested from stands within the THLB. I discuss my considerations of this further under “*Partitions*” and in my “**Reasons for Decision**”.

- deciduous-leading stands and non-merchantable timber

Deciduous-leading stands in most of the supply blocks of the Pacific TSA are considered non-merchantable in current practice. Deciduous-leading stands occupy approximately three percent of the land base of the TSA. All deciduous-leading stands were excluded during the delineation of the THLB, for a total of 2860 hectares after other reductions.

As well, coniferous-leading stands below a minimum volume threshold and below a minimum height are considered non-merchantable. In the base case, stands in the TSK business area that did not achieve a minimum volume of 300 cubic metres per hectare and a minimum height of 19.5 metres by 200 years of age were excluded in the derivation of the THLB. For the TSG and TST business areas, the requirement was 300 cubic metres per hectare by age 150 years. A total of 36 211 hectares of coniferous-leading stands that did not meet these minimum thresholds were excluded from the THLB after other reductions.

Input from the CFPA noted that the exclusion criteria for coniferous-leading stands seemed excessive and asked if any work was done to determine if the 300 cubic metres per hectare limit was appropriate, such as assessing if there is any harvest history in these stands that suggest issues with the accuracy of the inventory data. BCTS staff responded that the criteria were comparable to those for adjacent TSAs, and historically, there is very little harvest in older stands with volumes less than 300 cubic metres per hectare.

Having considered the information about deciduous stand exclusions, I note that alder can be included in timber sales in combination with other species and harvest of alder could represent an opportunity for BCTS. BCTS reported that approximately 700 hectares is occupied by alder-leading stands in the TSA. Should it be possible for these areas to contribute to timber supply, this represents an opportunity in the future for an increase to the size of the THLB. However, as current practice does not include significant harvest of alder, I make no adjustments on this account for this determination. I encourage BCTS to review the opportunities for this volume to be included in timber sales and monitor the harvest of alder over the term of this determination.

With respect to the minimum volume threshold applied to exclude low-volume coniferous-leading stands, I am aware that a threshold of 350 cubic metres per hectare has been applied in other coastal management units and harvesting has been observed at these levels; however, the harvest that has occurred close to this threshold has been seen primarily in spaced and managed Douglas-fir stands. Current practices in the Pacific TSA have tended to be harvested well above 300 cubic metres per hectare, with most harvest averaging reported scaled volumes of 500 cubic metres per hectare. Acknowledging that scaled volumes cannot be directly correlated to inventory volumes, the values nonetheless suggest that harvest in lower volume stands is not current practice. As a result, I accept that the minimum volume thresholds used by BCTS to exclude non-merchantable coniferous stands are reasonable and supported by current practice, and make no adjustments on this account.

- *unstable terrain*

Terrain stability mapping is available for the majority of the Pacific TSA and was used to identify areas of unstable or potentially unstable terrain. Where no terrain stability mapping was available, environmentally sensitive area (ESA) mapping was used.

Terrain stability class “V” (unstable terrain) and ESA class “ES1” areas were entirely removed in the derivation of the THLB. For terrain stability class “IV” (potentially unstable terrain) and ESA class “ES2” areas, a 50 percent reduction was applied in the TSG and TST business areas, and a 20 percent reduction in the TSK business area. BCTS staff indicated that these assumptions reflect current operational practices. A total of 58 083 hectares were excluded in the derivation of the THLB to account for unstable and potentially unstable terrain.

Interfor provided input expressing concern that the exclusions also included areas of class V terrain that had previously been harvested. The company suggested that if an area had been harvested in the past it would likely be operable again in the future.

I note that for other coastal management units, the land base exclusion applied to class V terrain typically allows between 5 percent and 15 percent of these areas to contribute to the THLB. This allowance for partial contribution of class V terrain is generally done to account for the proportion of class V terrain that is expected to support timber harvesting. During my overview flight of portions of the Pacific TSA in the TSG and TST business areas, I observed that there are also areas of future logging potential in the unharvested portion of class V terrain.

BCTS reported that there are approximately 950 hectares of previously-harvested class V terrain in the TSA, with almost all of this area occurring in the TSG and TST business areas. BCTS staff confirmed that very little class V terrain in the TSK business area has been harvested, despite this area having a relatively high proportion of class V terrain in comparison with the southern business areas.

FAIB staff advised me that if 10 percent of the unharvested class V terrain were to be considered operable in the TST and TSG business areas, the THLB in these business areas would be increased by about 0.8 percent.

Given the amount of harvesting that has occurred in class V terrain in the TST and TSG business areas and my observations during the TSA overflight, I consider that it is reasonable to assume that all of the previously harvested area of class V terrain as well as some proportion of unharvested class V terrain could contribute to the timber supply, in the TST and TSG business areas only. Given the experience in other coastal areas, it is reasonable to assume that 10 percent of unharvested class V areas would be suitable for harvesting.

As such, I consider that long-term timber supply in the TST and TSG business areas has been underestimated in the base case by one percent through the exclusion of previously harvested class V terrain. In addition, the base case assumption that all class V terrain areas in the TST and TSG business areas is non-harvestable, rather than 10 percent harvestable, has resulted in the short-term and long-term timber supply in the TST and TSG business areas being underestimated by 0.8 percent. I will discuss these two adjustments further in “**Reasons for Decision**”.

- *species at risk*

In the Pacific TSA, wildlife habitat areas (WHAs) have been legally established for Northern Goshawk, Red-Legged Frog and Marbled Murrelet. There are some additional proposed WHAs for these species as well as other species such as grizzly bear.

All areas legally established as WHAs were excluded in the derivation of the THLB. As well, the area in proposed WHAs that met the requirements of the Forest Planning and Practices Regulation (FPPR) Section 7 Species at Risk Notice were excluded from the THLB.

The TSA also includes some reserve areas for Marbled Murrelet that have been designated in addition to the WHAs described above. A total of 5253 hectares have been set aside in the TSG business area to meet the intent of the FPPR Section 7 Species at Risk Notice. These areas were excluded in the derivation of the THLB.

The total area of WHAs excluded on these accounts was 30 676 hectares. These exclusions reflect current operational practice in the TSA.

Those areas currently in proposed WHAs but not listed in the FPPR Section 7 notice were not excluded in the derivation of the THLB. These areas total 222 hectares and are proposed for Northern Goshawk and Red-Legged Frog.

Additionally for species at risk, the Federal Draft Recovery Strategy for Northern Goshawk provides direction for managing the species. For the timber supply analysis, known nests located within the TSA were identified spatially. For the known nests that did not overlap an existing area already excluded as a WHA, the nest-site habitat were delimited by a 200-metre buffer, for a total of 80 hectares. As this additional habitat area is not legally established, it was not excluded from the THLB in the base case.

Additional guidance from the Coast Forest Conservation Initiative (CFCI) goshawk protocol recommends management practices for goshawk nest sites, including a range of management options for nest reserves which vary by the assessed risk of territory abandonment. Goshawk Management Area (GMA) sizes range from less than 25 hectares, associated with very high-risk of abandonment, to 200 hectares, considered very low risk. A GMA size associated with moderate risk is listed at between 40 and 70 hectares in size. Applying a level of habitat protection at the midpoint of this range to the known nest sites identified in the TSA would place approximately 400 hectares of THLB within GMAs.

BCTS staff are aware of one peregrine falcon nest within the TSA. Operationally, such nests are protected with a 200-metre reserve buffer, equating to a 12 hectare land base exclusion. This area was not excluded from the THLB.

I have considered the reductions applied in the base case to account for the management of wildlife, including species at risk, in the Pacific TSA. I am satisfied that the established WHAs as well as those proposed WHAs meeting the intent of the FPPR Section 7 Species at Risk Notice were appropriately excluded from the THLB in the base case. With respect to the proposed WHAs which are not included in the Section 7 order, I am satisfied that these areas remain in the THLB until such time as they are legally established, noting that their inclusion in the THLB for the purposes of timber supply analysis does not dictate the management of the areas on the land base.

In addition, I am satisfied that the reserves for Marbled Murrelet were appropriately accounted for in the base case. I am aware that there is potential for 400 hectares of THLB to be set aside for the management of goshawk nest sites and further 12 hectares of THLB to be set aside for management of peregrine falcon habitat, and these species are both species at risk and the direction provided regarding the management of the areas has received some level of approval by government or reflect current operational practice. As a result, I will take the timber supply implications of this additional reduction in the size of the THLB into account in my determination, as discussed under “**Reasons for Decision**”.

- *cultural heritage resource reductions*

Archaeological values, which are managed under the *Heritage Conservation Act*, and archaeological sites are physical evidence of how and where people lived in the past.

There are 597 known archaeological sites within the Pacific TSA, covering a total of 748 hectares. These areas are located within, but not limited to, the vicinity of the Douglas Channel, Gardner Canal, Kowesas River, Chief Mathews Bay, Amos Passage, Kindala Arm, and Dala River. To reflect current operational practices of not harvesting in these areas, in the base case the known sites were excluded during the derivation of the THLB.

The *Forest Act* defines cultural heritage resources (CHR) as an object, site or location of a traditional societal practice that is of historical, cultural or archaeological significance to British Columbia, a community or an aboriginal people. CHRs are managed through FRPA. CHRs include traditional use features that are associated with past and current aboriginal use, and include hunting grounds, fishing areas, travel corridors and camp/seasonal village sites. These are predominately found along major water courses although they can be found inland. Other traditional use sites of importance to First Nations can include spiritual sites, battle sites, gathering sites for berries or medicinal plants, and burial sites.

The Vancouver Island Land Use Plan (VILUP) outlines objectives for Cultural Special Management Zones (SMZs) and states that consultation with First Nations is required prior to harvesting activity in Cultural SMZs. The Cultural SMZs overlap with 652 hectares of THLB in the Pacific TSA. In the base case, to reflect that harvesting activity may occur in these areas, Cultural SMZs were not excluded from the THLB, and no specific management regime was modelled.

District staff noted that BCTS manages for cultural heritage values by placing them in reserves that are co-located, where possible, with reserves for other values.

The Haisla Nation provided a copy of the report, *The Haisla Resource and Culturally Significant Sites within the NCLRMP, KLRMP and CCLRM* which identifies several culturally significant sites (archaeological, traditional, and ceremonial) within the Pacific TSA. BCTS operations staff for the TSK business area reported that they refer to this document when considering development in an area to inform on Haisla’s interests in the area. Other sources of information when available are also used by BCTS to identify archaeological sites and interests. BCTS staff noted that many areas with culturally significant sites fall outside the THLB, and that often the interest can be managed through landscape-level or stand-level objectives. Ministry staff noted that many of the Haisla cultural areas are located near or overlapping with known archaeological areas already excluded from the THLB.

First Nations require access to large cultural cedar (LCC) on both the THLB and the non-harvestable land base on a continual basis, and a sustainable supply maintained into the future. The Nānwākōlas First Nations requested information about how much western redcedar (cedar) and yellow cedar (cypress) were harvested over time in the base case forecast. BCTS provided a summary of the volume of cedar and cypress by age class harvested in the base case forecast and retained on the land base over time. At a meeting with FAIB staff, Nānwākōlas First Nations voiced their expectation that BCTS will work with them in the development and implementation of a strategy to identify and manage the supply of LCC in the Pacific TSA. The Nānwākōlas First Nations also referenced the Province's commitment made during government-to-government discussions on the Great Bear Rainforest, to providing an annual summary report of the Harvest Billing System (HBS) database regarding cedar harvest to Nānwākōlas. Nānwākōlas First Nations intend to use this information to monitor harvest rates of cedar within their territory.

Staff indicated that many of the redcedar and cypress stands on the THLB are projected to be harvested and regenerated to younger managed stands with components of redcedar and/or cypress by the fifth decade of the harvest forecast. Overall, across the TSA land base, a significantly larger proportion of old redcedar and cypress stands is projected to be maintained over time much of which falls outside the THLB.

I have reviewed the information regarding cultural heritage resources provided by BCTS and district staff. I note that government has a joint decision making protocol with the Nānwākōlas First Nations for areas within their asserted traditional territory. I discuss my considerations of this further under "*Nānwākōlas First Nations Decision Making*" later in this document.

In the case of known archaeological sites, I accept that amount of area reserved under current management practices for these sites was adequately accounted for in the base case. I am aware that no explicit reductions were applied to account for cultural resources outside of known archaeological sites. While I accept that the area that will be needed to protect sites identified in the future will largely overlap the non-THLB or overlap areas reserved for other resource values, I also expect that given the extensive First Nations history in the area of the TSA, additional THLB reductions will be required in order to effectively manage for these resource values. As a result, I will take into account a small unquantified overestimation of timber supply in the mid to long term on this account, and discuss this further under "**Reasons for Decision**".

I would like to acknowledge the work done by the Haisla to improve the available information about their interests in the TSA land base, and I encourage the sharing of information to continue as it supports the ability to look after these resource values during operational planning. I expect BCTS and district staff continue to work with all First Nations to better locate the resources on the land base so that they can be explicitly accounted for in future timber supply reviews.

With regard to the supply of LCC over time, it seems that most of the LCC requirements for First Nations into the future can be met outside of the THLB. However, I expect First Nations, BCTS and district staff to continue to monitor the available supply and the extent to which it is adequately met, such that any necessary adjustments to the assumptions can be factored into future timber supply analyses.

Existing forest inventory

- forest inventory

The current forest inventory in the Pacific TSA is a combination of data from a newer Vegetation Resource Inventory (VRI), a Forest Cover (FC1) inventory and several non-standard TFL inventories. Each of the data sources was converted into a VRI format and projected to 2014 by FAIB staff. For the analysis, the data were combined into one inventory file, corrected for known data issues, and then projected to 2016 for the start of the forecast period.

FAIB staff note that new VRI information is expected to be complete for many of the blocks of the TSA between 2018 and 2020. In the interim, they note the inventory information used in the analysis is considered to be the best available information for this determination.

I have reviewed the information about the forest cover inventory provided by BCTS and FAIB staff, and I accept that the inventory provides a reliable assessment of the current forest condition for the purpose of this determination. However, I expect FAIB staff to continue with the projected update schedule for the forest inventory information, as the renewal and update of this information is important for timber supply reviews.

- 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 coastal TSAs and TFLs, a report *Summary of Dead Potential Volume Estimates for Management Units within the Coast Forest Region* (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 2.7 percent to 14.3 percent of the green volume for existing stands over 60 years of age. An average calculated for all the coastal TFLs and TSAs for which data is available is 8.6 percent. FAIB staff indicated that these values represent the maximum amount of volume from dead timber that could be harvested.

Data specific to the stands in the Pacific TSA is not available and the possible utilization of dead-potential volume from the TSA has not been assessed. The base case harvest forecast did not include any assumed contribution from dead volume.

I have considered the available information about dead potential volume applicable to the Pacific TSA. I am aware that the potential volume available from dead yet merchantable stems in harvested stands is not accounted for in the timber supply projections. I believe that some portion of this volume in stands is likely economical to harvest, and therefore represents a level of available volume in addition to that projected in the base case. For this determination, I conclude that this potential volume contribution from dead stems represents a small, but unquantified underestimation of short-term timber supply projected in the base case, and I will discuss that further in “**Reasons for Decision**”.

Expected rate of growth

- managed stand yields

Stands established after 1965 were considered managed stands in the base case. Stands were grouped together by site index and biogeoclimatic zones and then were further grouped into four different regeneration eras according to the year of establishment, which determined

assumptions applied about spacing, regeneration delay and genetic gain. Yield tables were developed for the stand groupings. Some ingress of natural seedlings was assumed in the yield modelling for all stands.

Stands established between 1966 and 1978 (Era 1) were modelled as naturally regenerated stands using Variable Density Yield Predictor (VDYP), to reflect that despite many of these stands being planted, the species composition resembles naturally regenerated stands.

Stands established between 1979 and 2003 (Era 2) were modelled using the Tree and Stand Simulator (TASS) as having been regenerated through planting, with no genetic gain applied and a regeneration delay of two years. For the TSK Business Area, this era of stand establishment was extended to 2009.

Stands established between 2004 and 2009 (Era 3) in the TST and TSG business areas were modelled using TASS as regenerated through planting, with seedlings of modest genetic worth and a regeneration delay of two years. Stands established after 2009 (Era 4) and those regenerated in the future were modelled as future managed stands, and assumed to be planted and with genetic gains applied to the stands in the TST and TSG business areas only.

BCTS reported that Class A seed (i.e., seed with genetic gain), is used where available in the Pacific TSA. Data from the RESULTS information system was used to determine the proportion of trees planted with genetic gain for stands established between 2004 and 2009, and then a weighted average genetic worth value was calculated for each species. For the stands established after 2009 and into the future, the RESULTS genetic gain and planting data available was assumed to also predict future gains.

Very little data on past incremental silviculture activities such as pruning and spacing in the stands prior to the establishment of the Pacific TSA was available, and thus the generation of the yield curves did not include implications of incremental activities.

FAIB and district staff reviewed the assumptions used to determine managed stand yields and believe they are reasonably reflective of current practice.

Among the assumptions applied in the analysis to reflect current practice was an assessment that retention levels for wildlife tree patches exceed the 7 percent minimum retention required under FPPR for approximately 43 percent of the THLB. Higher levels of stand retention post-harvest has an impact on the growth of regenerating stands due to the shading of regenerating trees from retained trees. As a result, the growth and yield of future stands are expected to be impacted in areas where significant in-block tree retention occurs. A sensitivity analysis conducted to assess potential timber supply implications of the higher than 7 percent retention indicated that long-term timber supply could be reduced by up to 10 percent in the affected portions of the THLB.

The CFPA, Interfor and WFP commented that the dates assumed for the different management eras should be reviewed, given that the Pacific TSA is comprised of stands previously from TFL lands and consequently it has a more advanced managed regeneration history than assumed in the base case. They note that the use of seedlings with genetic gain began before 2003, and a considerable amount of silvicultural activities was conducted during the 1990s. BCTS reported that available data for the TSA was limited on silviculture activities prior to 2003.

Having reviewed the information about the assumptions for managed stand yields, I agree that it is reasonable to assume that some enhanced silviculture activity, including an earlier use of genetically improved seed as it was available, likely occurred on portions of the Pacific TSA land base, given the history of the area in TFLs where such activities were more common. In the same vein, I expect incremental activities such as pruning and spacing also occurred on the land base, and I am aware that the base case forecast did not include assumptions about such activities. I therefore conclude that it is appropriate to take into account a small, unquantified underestimation in the mid-term timber supply presented in the base case, and I discuss this further in “**Reasons for Decision**”.

In addition, I conclude that additional shading resulting from the increased levels of in-block retention on 43 percent of the THLB would be expected to have an impact on the growth of regenerating stands. As such, I accept that there is a small, unquantified overestimation of timber supply in the long term on this account. I will discuss my consideration of these factors in “**Reasons for Decision**”.

- operational adjustment factors for managed stands

Operational adjustment factors (OAFs) are applied to managed stand yield curves to reflect average operational growing conditions. OAF 1 is applied to account for yield reductions associated with non-productive areas in stands, uneven spacing of trees, and endemic or random losses. OAF 2 is applied to account for increasing volume losses as stands mature that is attributable to decay, waste, breakage, disease and pest factors. Standard OAF values are 15 percent and 5 percent for OAF 1 and OAF 2, respectively.

Laminated and armillaria root diseases are common in the Pacific TSA and managed Douglas-fir stands often exhibit volume losses from these diseases. To reflect these increased volume losses, recommendations to adjust values for OAF 2 for several biogeoclimatic subzones were made by the forest pathologist for the West Coast Region. The pathologist recommendations were to increase OAF 2 from 5 percent to 12.5 percent for all existing managed Douglas-fir stands and to 10 percent for future managed Douglas-fir stands in the biogeoclimatic (BEC) CWH xm1 and CWH xm2 subzones.

To reflect this in the base case, an area-weighted OAF 2 was calculated for the relevant BEC stand grouping, which was comprised of stands in the CWH dm, CWH mm1, CWH xm, CWH xm1 and CWH xm2 biogeoclimatic variants. The resultant OAF 2 values of 6.8 percent for existing managed stand yields and 6.2 percent for future managed stand yields in this BEC group were applied in the base case.

Input received from CFPA, Interfor and WFP commented that the application of the standard OAF 1 and OAF 2 values should be reviewed, suggesting that these values are too high given the fuller site utilization realized in current practice. In response, FAIB staff note that without local field data acquired through the Young Stand Monitoring (YSM) program or similar studies, the default values are considered the best available information, for areas not affected by root disease. FAIB staff state that the base case assumptions represent the best available information, in conjunction with the adjustments applied to the OAF 2 value for the root disease-impacted stands in the specific BEC variants identified.

I have considered the assumptions for OAF applied in the base case. I acknowledge the concerns expressed by forest industry regarding improved site utilization, in particular for

future managed stands, and the possibility that the OAF 1 values overestimate losses as a result. However, in the absence of data specific to the TSA, I accept that the values applied for OAF 1 and OAF 2, in combination with the adjustments to account for root diseases, adequately reflect current conditions in the TSA and represent the best available information.

I expect a YSM project to be conducted in the Pacific TSA in order to assess site occupancy and better quantify appropriate OAF percentages for use in timber supply review, as discussed under “**Implementation**”.

- *minimum harvestable age*

Minimum harvestable criteria are used in the timber supply model to control when existing and future managed stands become merchantable for harvest. In the base case forecast, the minimum harvestable criteria for stands in all analysis units was set to the age at which each stand was predicted to reach a volume of 300 cubic metres per hectare.

BCTS staff indicate that in practice, most forest stands are harvested at ages older than the assumed minimum harvestable age, due to economic considerations and various constraints on harvest that arise from the management for other forest resource values.

Comments received from Interfor and WFP expressed the opinion that using the volume threshold as the only criteria for determining minimum harvestable ages likely results in a substantial portion of the volume in the base case forecast originating from stands that have not reached culmination age. They further note that setting minimum harvestable age using volume-based criteria alone does not factor in merchantability based on piece size and species. Interfor in its input also noted that the harvest age modelled in the base case was not consistent with current practice or the ages applied in other management units.

WFP also commented that the minimum harvest criteria may result in stands being harvested in the modelling before reaching merchantable size, and well before achieving their maximum mean annual increment (MAI).

Interfor stated that in other management units they noted a mid- to long-term increase in timber supply is possible when stands, managed for density, are harvested close to or after the age at which they reach their maximum mean annual increment. Interfor suggests the analysis should be corrected to ensure managed stand volumes reflect the productive capacity of the site and produce logs of sufficient volume to meet economic criteria.

FAIB staff note that managed stands are not harvested in the base case until the third decade of the forecast and do not contribute the majority of volume until the fourth decade. This is, in part, a result of the application of the relative oldest first harvest rule in the base case (as discussed under “*harvest rules and priority*”). The timber supply is sensitive to the availability of second growth timber at this critical point in the harvest forecast. In their review of the base case, staff found that some contribution to the mid-term harvest is from stands that have not yet reached MAI. Increasing the ages at which stands are assumed to be available for harvest in the base case to the age at which the stands reach 95 percent of their MAI (i.e., culmination MAI, or CMAI) had the effect of increasing the long-term growing stock and thus increased long-term timber supply. However, increasing the minimum harvestable age in this manner also resulted in a need to reduce the short-term harvest level in order to prevent a decline in the mid-term harvest level. To summarize, the analysis shows that increasing the minimum harvestable age such that stands must reach CMAI before they

are harvested results in a one percent increase in the long-term harvest level and about a 5.8 percent decline in the short-term harvest level.

In light of the information about the minimum harvestable criteria assumed in the base case, my considerations are as follows. I am aware that the 300 cubic metre threshold for stands applied in the base case is not reflective of current operational practice in the TSA. Operationally, as discussed under “*harvest rules and priority*”, a level of harvest is occurring in managed stands but not in stands close to that minimum threshold.

I recognize that it is reasonable to assume that BCTS will continue its current practices, and some portion of the harvest will continue to come from young managed stands, which will result in some portion of older stands reserved to the mid term. Although the base case does not reflect current practices for this factor, I am satisfied from my review of the information that the short- to mid-term timber supply projected by the base case is achievable and I make no adjustments for this determination. However, I caution BCTS to ensure that their operations do not include the harvest of many stands below CMAI so as to not negatively impact long-term timber supply in this TSA. I expect BCTS to monitor harvested stand volumes over the term of this determination so that any adjustments to reflect operational practices can be applied at the next timber supply review.

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

No factors considered under this section require additional comment.

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

No factors considered under this section require additional comment.

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

No factors considered under this section require additional comment.

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

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 (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

- higher level plans

The area of the Pacific TSA falls within several higher level plans, including the Vancouver Island Land Use Plan (VILUP) Order, the Great Bear Rainforest (GBR) Land Use Order, the Clayoquot Sound Land Use Order and the Kalum Sustainable Resource Management Plan (SRMP). The base case analysis reflected requirements as stated in the higher level plans. As

noted earlier in this document, for the purposes of this AAC determination, areas of the TSA within the GBR were considered removed from the TSA, were not included in the base case forecast and did not contribute to the TSA timber supply projections.

Input received from the Clayoquot Sound Conservation Alliance commented on the pending inclusion of the Upper Kennedy in a forest stewardship plan (FSP). The input requested that the Upper Kennedy continue to be off limits in industrial activity from BCTS. District staff indicated that the majority of the area in the Upper Kennedy watershed was excluded in the derivation of the THLB for various reasons and the assumed contribution to timber supply from the area is small.

I have considered the input, and note that it is not appropriate for me to speculate on land use decisions that have not yet been undertaken by government, and therefore I cannot assume the Upper Kennedy Watershed does not contribute to the timber supply of the Pacific TSA. However, practices within this area are subject to the requirements of the Clayoquot Sound Land Use Order, which were reflected in the base case, and any FSP or other operational plan developed for the area is expected to reflect those requirements. Should a land use decision be made by government, the implications can be factored into the next timber supply review for the Pacific TSA.

For this determination, I am satisfied that the base case appropriately reflects the intent of the higher level plans that apply to the area, and no adjustments are required.

- scenic areas and visual quality objectives

A visual quality objective (VQO) is a resource management objective established for an area that reflects the desired level of visual quality based on the physical characteristics and social concern for the area. VQOs are managed for on 96 843 hectares of the CFLB in the Pacific TSA.

Guidelines to meet the VQOs include setting a maximum percentage of a specified area that is allowed to be denuded at any one time, and setting a visually effective green-up (VEG) height at which a regenerating stand is perceived by the public to be satisfactorily greened-up. In the timber supply analysis, forest cover objectives were applied that were consistent with the established VQOs. In the base case, the VEG height for each stand was calculated according to standard procedures and the area-weighted average slope class for each visual unit.

Areas designated with Preservation VQOs were excluded in the derivation of the THLB. Areas within Clayoquot Sound have unique objectives of Scenic Class Objectives (SCOs), and these were translated to VQO classifications for the purposes of the analysis.

District staff indicated that the accounting for the management for visual quality in the analysis represents the best available information for the area of the TSA. However, staff also noted that data were not consistently available for all areas of the TSA and some discrepancies were found between different datasets.

I have considered the information regarding the analysis assumptions for the management of visual quality in the TSA and I accept that the assumptions represent an acceptable estimation of operational requirements and practices. In acknowledgement of identified concerns regarding data quality and as described under “**Implementation**”, I expect FAIB staff to work with other Ministry staff to determine how to better manage the data required for timber

supply reviews, and develop some recommendations for implementation that ensure all data layers are accurate, updated and maintained as needed.

- landscape level biodiversity

In most of the landscape units within the Pacific TSA, landscape level biodiversity is management through the establishment of Old Growth Management Areas (OGMAs). The legally-established OGMAs within the TSA have been spatially defined and the area reserved from harvest. Several other OGMA areas are considered “non-legal”, and these have not yet been legally established but are included in a FPPR Notice stating that they meet the requirements of Section 9 of the Order Establishing Provincial Non-Spatial Old Growth Objectives. Draft OGMAs have been also set aside to meet some non-spatial old growth order requirements

The legal OGMAs within the TSA have been spatially defined and the area reserved from harvest. Several other OGMA areas are considered “non-legal”, and these have not yet been legally established but are included in a FPPR Notice stating that they meet the requirements of Section 9 of the Order Establishing Provincial Non-Spatial Old Growth Objectives. Draft OGMAs have been also set aside to meet some non-spatial old growth order requirements.

Current operational practice in the TSA is to consider all of these areas regardless of status as non-harvest areas during operational planning. As a result, in the base case all of the OGMA areas, totalling 43 881 hectares, were excluded from the THLB.

A portion of the Pacific TSA, in the TSK Business Area, falls under the Kalum SRMP. Under this plan, there are five undeveloped watersheds with specific old seral stage targets based on PEM site series. The total of CFLB within the five watersheds (Brim, Hugh, Owyacumish, Wahoo and Wathlsto) is 16 819 hectares. In the base case, targets for old-seral retention were applied by site series for each watershed. Targets were not available under the Kalum SRMP for a few site series; in such cases, a target was applied from a similar site series in another watershed.

Another portion of the Pacific TSA falls within Clayoquot Sound. In this area, landscape level biodiversity was modelled through the application of a 40 percent old seral retention target at the watershed level.

Input received from Interfor questioned the exclusion of the proposed OGMAs from the THLB, as well as the exclusion of the draft OGMAs, noting that both could potentially be replaced with areas in non-economic portions of the land base. BCTS staff responded that the proposed OGMAs were excluded because the OGMAs were drafted to meet the requirements of the Non Spatial Old Growth Order, and the selection of these areas did include consideration of suitable non-contributing land base first to meet the requirements. In addition, BCTS notes that the exclusion of these areas is consistent with how the areas are being managed for in current practice.

Overall, district staff agreed that the assumptions applied in the base case are reflective of current practices in the TSA.

I have reviewed the information regarding the modelling assumptions for landscape level biodiversity in the base case. I am aware that some of the areas excluded from the THLB as OGMAs have not yet been legally established. However, I understand that the process to identify the draft OGMAs considered co-location principles and included an assessment of the

suitability of areas that do not contribute to the timber supply for other reasons. As a result, any potential movement of these currently draft OGMA areas is not expected to result in increased timber supply. I accept that the assumptions applied in the base case reflect the best available information and provide an accurate projection of current management for landscape level biodiversity and I make no adjustments on this account.

- block minimum volume constraints

Many of the supply blocks of the Pacific TSA are geographically isolated from one another, and a timber sale licence is typically issued to apply to volume in one block only. Each independent harvesting operation must be economically viable and meet mobilization and demobilization costs. As a result, any one harvesting operation requires a minimum harvest volume.

In order to reflect these constraints in the harvest forecast, a five-year harvest volume constraint was applied in the base case to select supply blocks or supply block groupings. The volume requirements were set based on historic timber supply licence size for each block, and primarily were applied to the smaller blocks of the TSA.

A sensitivity analysis in which the volume requirement was relaxed showed that this constraint did not impact timber supply.

Input was received from Interfor and the CFPA regarding the application of the minimum volume requirements by block groupings. They noted that the geographic connectivity and spatial adjacency within the TSA units do not support the need for minimum harvest volumes, in particular in areas where there are operations occurring in adjacent management units that could assist with ensuring minimum economic criteria could be met.

BCTS staff responded that the dispersed nature of the TSA blocks does have an effect on the economics of the volume available. Costs for mobilization and demobilization are less for blocks on Vancouver Island. As noted above, a sensitivity analysis in which the minimum block volume constraints were removed showed no impact to timber supply.

I have considered the information regarding the block minimum volume constraints presented to me by BCTS and district staff and received in public comments. I am aware that many of the blocks of the TSA are adjacent to other tenures, such as TFLs, held by major licensees, and that efficiencies might be possible through partnerships between major licensees and BCTS license holders. I encourage these opportunities to be explored where feasible. However, for this determination, I acknowledge that the minimum block volume constraint does reflect current operational considerations for those blocks to which it was applied. In any event, the base case timber supply is shown to not be affected by the application of the minimum block volume constraint, and therefore I make no adjustments on this account.

- harvest rules and priority

The analysis for the Pacific TSA was completed using a sequential harvest simulation model, which uses harvest scheduling rules to determine the order of stands to be harvested.

In the base case, a relative oldest first harvest rule was applied, which means that the stands given the highest priority for harvest were those that had passed their minimum harvestable age and had the greatest difference between their minimum harvestable age and their actual age.

The application of the relative oldest first harvest rule in the base case resulted in the harvest of primarily old stands in the first decade of the harvest forecast. This focus also resulted in the conversion of older stands fairly quickly in the forecast to managed stands and overall maximized the available growing stock into the long-term forecast period.

In addition to the harvest rule, as noted in “block minimum volume constraints”, five-year harvest volume requirements were set in the base case for groups of supply blocks.

District staff noted that the base case harvest rule assumption does not reflect actual current practice in the TSA. Harvest profile information obtained from scale data indicates that approximately 30 percent of the volume harvested between 2011 and 2015 was from second-growth stands, all of which was harvested from blocks in the TST and TSG business areas. District staff also expressed concern that about the timber supply implications of the difference between this assumption and current practice. As a result of the use of this harvest rule, the base case initial harvest level assumes a greater initial contribution from higher volume old growth stands as well as a faster conversion of these stands to managed stands than is likely to be achieved in actual practice.

Two sensitivity analyses were completed to assess the timber supply implications of applying an alternative harvest rule from that used in the base case analysis. In the first sensitivity analysis, 41 to 60-year-old and 61 to 80-year-old stands that met minimum harvest criteria were prioritized for harvest. In this forecast, the conversion of the older stands (those more than 80 years of age) to managed stands over time was slower than in the base case, and this resulted in a one percent decline in the long-term harvest level. The short-term harvest level was unaffected.

In the second sensitivity analysis, priority was placed on all stands less than 81 years of age that met minimum harvest criteria. In the first decade of the forecast in this sensitivity analysis, 80 percent of harvest occurred in stands younger than 81 years of age. In this case, conversion of older stands was delayed to a greater extent than in the first sensitivity analysis, resulting in declines in the mid-term and long-term harvest levels by 11 and 9 percent, respectively.

I have considered the information regarding the harvest rule applied in the base case and the harvest priorities observed in current practice. I am aware the sensitivity analysis results indicated that the initial harvest level in the base case can still be met if operational practices include a mix of second-growth and old-growth stands. However, I am mindful that the sensitivity analysis results also indicate that the mid- to long-term timber supply would be impacted should operational harvest focus exclusively on stands less than 81 years of age. Further, I note that the slower conversion than assumed in the base case of older stands, with their correspondingly slower growth, to managed stands as a result of harvesting a greater proportion of managed stands in the short term, points to a one percent decrease in the long-term timber supply. In consideration of the above, I conclude it reasonable to take into account that long-term timber supply has been overestimated by a small, unquantified amount of less than one percent, and I discuss this further in “**Reasons for Decision**”.

As mentioned in “**Implementation**”, I expect BCTS to develop a strategy for the transition from old growth to second growth harvesting, including an evaluation of the longer-term timber supply implications, consideration of ideal piece sizes and species composition for the future, and implications for other forest management objectives.

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

- Great Bear Rainforest (Forest Management) Act

A land use planning process was initiated by government in 1996 for the north and south Central Coast areas of British Columbia with the intent to provide an appropriate balancing of social, economic, and environmental benefits for the province. A multi-stakeholder process involving First Nations, provincial and local governments, environmental organizations (non-governmental organizations or NGOs), and representatives from various sectors including forestry, tourism, and mining, resulted in the development of an ecosystem-based management (EBM) framework for this area. The land use objectives for this area were established under the South Central Coast Order (SCCO) dated August 2007. The SCCO established objectives for important First Nations values, aquatic habitats, and biodiversity values. Parallel to the SCCO process, government also designated a number of conservancy areas as well as biodiversity, mining, and tourism areas in 2009.

In March 2009, all parties agreed to a five-year implementation plan for ecosystem-based management in the area which has become known as the Great Bear Rainforest (GBR). The commitment was for all parties to review the Land Use Objectives Orders by March 31, 2014, with the goal of “concurrently moving to high levels of ecological integrity and high levels of human wellbeing and if that is not possible, to make meaningful increments to both.”

On January 1, 2017, under the *Great Bear Rainforest (Forest Management) Act*, the GBR Management Area was established. This area comprises a large region of land in the central and north coast which includes the Pacific TSA supply blocks 1, 2, 11-17, 25 and 26. Following the establishment of the GBR Management Area, the chief forester’s authority to determine the AAC, and specify AAC partitions, applies only to the parts of the TSA that fall outside the GBR (the non-GBR part of the TSA). For this reason the GBR part of the Pacific TSA was excluded from the timber supply analysis and is not within the area covered by this AAC determination.

Having reviewed the base case assumptions and information presented to me by staff, I am satisfied that the analysis appropriately reflects recent legal land use decisions taken by government, and make no adjustments on this account.

-climate change

Climate change predictions suggest that forest ecosystems will be impacted in a number of different ways as a result of increased temperatures, altered precipitation patterns and increased frequency of as well as severity of disturbances. Although research is ongoing, it is difficult to determine the magnitude of the climate changes and the implications for forests, and a significant amount of uncertainty still exists.

A West Coast Natural Resource Region Extension Note, *Adapting natural resource management to climate change in the West and South Coast Regions (2016)*, used current climate change research to summarize projected climate changes and impacts to ecosystems

for British Columbia. In this extension note, it is noted that “Averaged across the coast, over 1° C [Celsius] of warming has occurred during the 20th century. Projections suggest the West Coast may warm, on average, an additional 1.2 to 3.5° C by the end of this century and the South Coast an additional 1.9 to 5° C, similar to moving from Prince Rupert to Victoria (2.5° C warmer).”

The extension note additionally states “While it is normal for temperatures to vary considerably between seasons or from day to night, even a fraction of a degree rise in temperatures, when averaged over decades, is significant for ecosystems.” And “Seemingly small increases in mean values of climate variables can substantially increase the probability of an extreme event. For example the 10 percent increase in precipitation predicted for the Georgia Basin in the 2080s would increase the frequency of slope instability by 165 percent.”

It is believed that wildfires will become more frequent and the stand impacts of forest pests, such as Douglas-fir bark beetle, balsam bark beetle and the western spruce budworm will increase as altered precipitation levels stress and weaken stands established under previously existing climatic conditions. In very general terms, longer growing seasons may be a benefit for many tree species. However this will likely be offset where summer drought conditions increase, linked to generally lower summer precipitation and lower winter snowpack. It is projected that there will be a reduction in the amount of area considered as Alpine and Mountain Hemlock biogeoclimatic zones, and an increase in the amount of area considered as Coastal Western Hemlock biogeoclimatic zone.

Douglas fir is expected to continue growing well under warmer temperatures, even with increased summertime drought stress conditions. However, western hemlock, western redcedar, and grand fir are expected to show increasing levels of drought stress, particularly on drier sites, resulting in slower growth and possible mortality during series of hot, dry years. Overall, some tree species may become maladapted to the climate. Current data suggests that yellow cedar (cypress) along the coast are already observed to be experiencing mortality from reduced snowpack which exposes roots to frost damage.

There is ongoing consultation and collaboration in the region with federal and provincial government agencies, First Nations, universities and forest licensees to better understand climate adaptation and mitigation challenges and opportunities in relation to forest management. Findings from research initiatives can be incorporated into Coast Area climate actions. Climate change mitigation and adaptation strategies are discussed and developed through stakeholder engagement forums such as the Coast Operational Issues Forum and Forest Management Leadership Teams.

Having reviewed the information about climate change implications for the forests of the Pacific TSA, I acknowledge the work done to date to better understand the actions needed. Ongoing observations, data collection, analysis and discussions through various collaborative teams, include the Climate Change Forum, will play a critical role in ensuring we are able to respond to predicted implications for timber supply.

I am mindful that the extension note cited above highlights the potential implications to terrain stability from the increased precipitation levels anticipated to occur over time in this TSA, a consideration that has uncertain implications for future timber supply. I am concerned about the mortality trends seen in mature yellow cedar, as this species is important for First Nations cultural values. I note that this potential increased mortality trend places further importance

on ensuring reforestation activities include strategies for the continued occurrence of yellow cedar on the land base.

-harvest performance

The current AAC for the non-GBR part of the Pacific TSA is 1 279 700 cubic metres, which includes both BCTS and First Nations volume allocations.

Ministry staff compiled harvest performance data from the Harvest Billing System (HBS), including the proportion of scaled volume by tree species harvested in the TSA between 2010 and 2015. Harvest levels in the TSA have been below the AAC attributed to the TSA since the time of its establishment, particularly in the TSK Business Area. The results showed an actual average annual harvest level (for the non-GBR portion of the TSA) over the five-year period from 2010 to 2015 of about 598 000 cubic metres, or approximately 47 percent of the AAC. Harvest performance in the TSK business area has been particularly low; in the period between 2010 and 2015 only 12 percent of the AAC attributed to this area has been harvested.

I am aware that the actual annual harvest during recent years in the Pacific TSA has, on average, been below the AAC. BCTS report that, over the past seven years, an undercut volume of approximately 2.24 million cubic metres has accumulated in the Pacific TSA. Recently, Non Replaceable Forest Licences (NRFL) totaling 790 000 cubic metres, over five years, were awarded to the Nanwakolas First Nations in Block 18 from this undercut volume. I note that Block 18 is among the most heavily harvested supply blocks in the TSA, and that this additional commitment is incremental to the AAC and has the potential to affect the sustainable harvest level in this block.

BCTS examined the potential timber supply implications related to the allocation of undercut volume by conducting a sensitivity analysis which reduced the current TSA growing stock in blocks 18, 28 and 29 of the TSA by 1 million cubic metres– the unused volume committed to NRFLs in those blocks. This analysis showed that, although the growing stock reductions were compensated for in the first period by a shift in the harvest from other supply blocks, harvest reductions did occur in the second decade and continued over the long-term. Based on these results, BCTS staff expressed concern that the further issuance of undercut volume to licences, incremental to a fully apportioned AAC, would pose a risk to the sustainable timber supply in the Pacific TSA.

I have considered the information regarding harvest performance in the Pacific TSA presented to me by BCTS and FAIB staff. The sensitivity analysis results suggest that there is some flexibility to achieve the short-term harvest level even if an additional 1 million cubic metres of growing stock is harvested over the next five years. However, reducing the growing stock by the entire volume of the current undercut of 2.24 million cubic metres would not allow the harvest level in the base case to be achieved for several periods.

I note that any allocation and utilization of volume above what is presented in the base case, and above what is provided for within my AAC, puts the sustainable timber supply for the TSA at risk.

As well, the continuous under harvest in the TSK business area relative to AAC is cause for caution. I am concerned that the continuation of an AAC that is unlikely to be achieved in this area will lead to significant further accumulation of undercut volume. I am also compelled to guard against the risk to the sustainable harvest levels in other parts of the TSA if AAC

volume attributed to the TSK is harvested outside of this business area, and I will discuss this further under “Partitions”.

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

-partitions

The AAC in effect prior to this determination did not contain a partitioned volume.

The base case harvest forecast included an assumed contribution from Blocks 28 and 29, the blocks in the TSK Business Area, of 73 200 cubic metres per year. The proportion of the THLB in these blocks is a small percentage of the overall block area. The amount of harvesting that has occurred in this area in recent years equates to only 12 percent of the AAC attributed to the area. BCTS notes that it is important for their management of the TSA timber supply that the volume attributed in the base case to stands in the TSK business area not be harvested from stands in other parts of the TSA. This concern is also expressed in the recommendations made through the Nanwakolas First Nations Joint Decision Making process.

As noted earlier in this document, I believe there is the potential for additional volume to contribute to the harvest from areas that were assessed in the EOA as uneconomic for harvesting and were excluded from the THLB. However, my determination must ensure that any AAC that I attribute to potentially-economic stands located outside the THLB used in the base case not be harvested from stands within the THLB.

In making my determination, I have considered the information regarding the TSK blocks and the potential to harvest stands assessed as uneconomic for timber harvesting located outside of the THLB. For the reasons indicated above, and discussed in other sections of this document, I have decided to specify two partitions in this AAC determination to ensure that any volume assumed to be available from stands in the TSK Business Area, as well as volume from stands in areas assessed as not economic is not harvested from stands elsewhere in the TSA, and I will discuss my considerations of this further under “**Reasons for Decision**”.

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

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

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

Economic and social objectives

-Minister's letters

The Minister of Forests and Range (now the Minister of Forests, Range, Natural Resource Operations and Rural Development) has expressed the economic and social objectives of the Crown in several letters to the chief forester.

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

With respect to the 2006 letter, I note that the base case harvest forecast, as well as the alternative harvest flow projections provided, provided a harvest schedule that projected an orderly transition to a stable, long-term harvest level where the growing stock is also stable.

The minister, in another letter dated October 27, 2010, provided the Crown's objectives with respect to mid-term timber supply in areas affected by the mountain pine beetle. I note that the Pacific TSA has not been affected by the mountain pine beetle.

In a third letter dated April 12, 2013 (attached as Appendix 4), the minister expressed the government's social and economic objectives for signatory First Nations of the Nānwakōlas Reconciliation Protocol (NRP), and asked the chief forester to consider these objectives, in addition to others expressed in the earlier letters, when making determinations of allowable annual cut within the traditional territories of Nānwakōlas First Nations. I am aware that the asserted traditional territories of the Nānwakōlas First Nations overlap with the Pacific TSA. I discuss my consideration of the Nānwakōlas under "*Nānwakōlas First Nations shared decision making*".

During my consideration of the factors required under Section 8 of the *Forest Act*, I have been mindful of both the local objectives, as provided in the VILUP and associated plans and orders, as well as the objectives of First Nations including the Nānwakōlas First Nations. I have considered the socio-economic objectives expressed in the 2013 letter in this determination for the Pacific TSA, and have as well reviewed the public consultation process undertaken by the district and considered the input received in making my determination. On this basis, I am satisfied that this determination accords with the objectives of Government as expressed by the minister.

-First Nations consultation

The 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 lands and are considered to be part of the harvestable land base. Whether timber is actually ultimately harvested from those lands is an issue that is subject to allocation decisions, and the AAC determination does not determine that matter.

In the case of Aboriginal rights claims, the overall AAC can affect various resource values on which First Nations may have or still do rely in the exercise of such 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.

There are 30 First Nations that have traditional territory that overlaps at least one of the 30 blocks of the Pacific TSA. These First Nations are Chemainus First Nation/ Stz'uminus First Nation, Cowichan Tribes, Ditidaht First Nation, Gitxaala Nation, Gwawaenuk Tribe, Haisla Nation, Halalt First Nation, Heiltsuk Nation, Hupacasath First Nation, Kitsoo/XaiXais Nation, Klahoose First Nation, Kwakiutl Indian Band, Kwikwasutinuxw Haxwamis First Nations, Lake Cowichan First Nation, Lyackson First Nation, Mowachaht/Muchalaht First Nation, 'Namgis First Nation, Nuxalk Nation, Pacheedaht First Nation, Penelakut Tribe, Quatsino First Nation, Shishalh (Sechelt) First Nation, Skin Tyee Nation, Tla'amin Nation, Tla-o-qui-aht First Nation, Tseshaht First Nation, Wuikinuxv Nation, Cheslatta Carrier, Nee-Tahi Buhn, Nanwakolas SEA First Nations (the Da'naxda'xw Awaetlatla First Nation, Tlowitsis Nation, K'omoks First Nation, Mamalilikulla Nation and Wei Wai Kum First Nation), Gitga'at First Nation, Maa-nulth First Nations, We Wai Kai Nation (Nanwakolas), Yuulu?i?ath Nation (Maa-nulth), and Hwlitsum.

At least one of the Pacific TSA blocks overlaps with the Maa-nulth Final Agreement Areas, which includes the Huu-ay-aht First Nations, Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe and Yuulu?i?ath Nation. The TSA also overlaps with the traditional territories of five of the six signatory Nanwakolas Strategic Engagement (SEA) First Nations (Mamalilikulla Nation, Tlowitsis Nation, We Wai Kai First Nation, Wei Wai Kum First Nation and K'omoks First Nation), and the Hwlitsum asserted traditional territories.

The primary purpose of the consultation was to seek from First Nations their concerns regarding the projected timber supply and AAC for the TSA and to learn what Aboriginal interests may be impacted by the AAC decision. Where the Province and First Nations have negotiated a treaty or have contractually agreed to a process for consultation, that process was followed. Consultation with the signatory members of the Nanwakolas Reconciliation Protocol (the Da'naxda'xw Awaetlatla First Nation, Tlowitsis Nation, K'omoks First Nation, Mamalilikulla Nation and Wei Wai Kum First Nation) was conducted consistent with that protocol, and is discussed in the next section of this document "Nanwakolas First Nations decision making".

For those First Nations who do not have a specific consultation/engagement process agreement in place, Ministry staff considered the potential for the proposed decision(s) to impact upon Aboriginal interests in order to inform the suggested consultation level.

Consultation with First Nations began in September 2014 and was coordinated by the West Coast Natural Resource Region. Information sharing was led by BCTS staff and district staff provided assistance to the consultation and to BCTS during the process. A notification letter was sent on September 9, 2014, to all applicable First Nations indicating that the timber

supply review process had begun. This letter defined the process, included basic information on the three stages of the process, and provided additional information on the AAC determination. It also provided some history of the creation of the Pacific TSA and some timelines, and enclosed a one pager providing a summary on how Aboriginal Interest can be brought into the timber supply review process, a link providing further information on the Pacific TSA timber supply review and an overview map of the Pacific TSA.

First Nations engagement and consultation on the draft information package began on January 29, 2016. Each applicable First Nation was sent a letter providing a brief review of the timber supply review process, and also provided some information on the draft information package. A link regarding the Pacific TSA timber supply review was included as well as a Pacific TSA overview map and draft information package. The First Nation was invited to comment on the document and to suggest additional information on Aboriginal interests that could be used in the timber supply analysis. The letter also indicated that additional consultation/engagement would occur for the timber supply analysis report. Comments were requested within a 60-day period which ended March 31, 2016. The consultation period was extended twice for the 'Namgis to discuss the information package via conference call, which occurred on April 20, 2016.

On September 15, 2016, each applicable First Nation was sent a consultation/engagement letter regarding the 2016 Timber Supply Review Analysis Report – Pacific TSA (the analysis report). The letter commenced a 60-day consultation process ending November 15, 2016. This letter mentioned and briefly described the topic of the past correspondence sent by the Ministry, gave a brief description of the analysis report, provided a link to the report, provided information on the AAC determination and rationale, and attached an overview map of the Pacific TSA. Each First Nation was asked to review the analysis report and provide comments or concerns regarding the information it contained. Each First Nations was also asked to inform the ministry of how their Aboriginal interests in the area may be impacted by an AAC decision. This letter extended an offer for Ministry staff to meet with the First Nation to discuss the information provided, and also indicated once the AAC determination was made the rationale would be sent to each of the applicable First Nations.

Where applicable, the letters to First Nations included a level of consultation as outlined in applicable First Nations agreements, including a Strategic Engagement Agreement (SEA), Forest Consultation and Revenue Sharing Agreement (FCRSA), or Reconciliation Protocol (RP), as applicable. Ministry did not receive any correspondence from applicable First Nations disagreeing with the Ministry's suggested level of consultation and/or engagement.

The letters indicated that all information received would be summarized and provided to the chief forester to be considered in the AAC determination for the Pacific TSA. Consistent with this commitment, staff have provided the information to me and I have reviewed and considered it for the purposes of this determination.

Those comments that were received from First Nations whose asserted traditional territories overlap the portion of the Pacific TSA that falls within the Great Bear Rainforest have not been included in this document, as this AAC determination is not applicable to those areas. In general, the comments and concerns from First Nations included but were not limited to the following points.

The Gwawaenuk Tribe provided comments to the timber supply review asserting Aboriginal rights to their traditional territory in the Pacific TSA all of which is within the GBR-part of the TSA. The Gwawaenuk Tribe stated that the AAC determination will seriously impact their Aboriginal Interests as it determines how much volume will be harvested from their territory. They also want old-growth forests within their territory protected from harvesting. I acknowledge the comments of Gwawaenuk Tribe. However, as noted previously, under the *Great Bear Rainforest (Forest Management) Act*, my authority to make an AAC determination for the Pacific TSA extends only to the non-GBR part of the Pacific TSA which is outside the traditional territory of the Gwawaenuk Tribe.

The Haisla Nation provided a copy of the report “The Haisla Resource and Culturally Significant Sites within the NCLRMP, KLRMP and CCLRM”, which identifies several culturally significant sites within the Pacific TSA that exist in addition to registered archaeological sites. My consideration of this information is discussed earlier in this document under “cultural heritage resource reductions”.

The ‘Namgis First Nation has a Forest Strategic Agreement with BCTS, which includes ongoing collaboration related to high-level forest management and planning activities. The ‘Namgis concerns relate to Blocks 8 and 10, as these blocks overlap with their asserted traditional territories. The ‘Namgis First Nation comments included: the current AAC for block 8 is too high; would like to see a consent based approach to all natural resource development, and the introduction of an EBM on Vancouver Island included in modelling assumptions; concerns regarding fish habitat, health of the Nimpkish River ecosystem, wildlife and biodiversity, Goshawk Wildlife Habitat Area, management of old growth, wildlife tree retention, and cultural heritage; and that the timber supply review may not fully consider the impact to CMTs, monumental cedar and other non-timber forest resources with cultural values for the non-EBM portion of the TSA.

The shíshálh First Nation provided comments prior to the signing of their Interim Forestry Agreement with the Province that the Pacific TSA overlaps with their asserted traditional territory and that in their opinion, there was not adequate consultation in a previous timber supply review process. Since the signing of their agreement, the shíshálh First Nation has provided no further comment on the timber supply review for the Pacific TSA.

I have reviewed the consultation process conducted by Ministry staff and the input received from the First Nations whose asserted traditional territories overlap with portions of the Pacific TSA. With respect to the Namgis concerns, I am aware that BCTS staff reviewed the periodic harvest contribution from Block 8 and the projected forest composition for Block 8 and 10 resulting from the base case assumptions, or other aspects of the analysis, such as assumptions regarding wildlife, biodiversity and cultural heritage values in ‘Namgis First Nation’s traditional territory. I am satisfied, as discussed under factors in this document, that the base case assumptions have appropriately reflected the management necessary for the values present in the Pacific TSA, or as noted, I am making adjustments in my determination as required to ensure all values are appropriately accounted for in the assessment of the TSA’s timber supply. I am also aware that the base case forecast assumes a level of harvest reduced from the current AAC for the TSA, including reduced levels of harvest in Blocks 8 and 10.

I acknowledge the ‘Namgis First Nation’s desire for the introduction of EBM on Vancouver Island; however, this involves a land use decision not currently contemplated by government.

The timber supply review focussed on the assessment of a sustainable timber supply for the TSA under the current management and legislative framework and was guided by the chief forester's principles for determining AAC, and as noted elsewhere, I am satisfied the analysis provided the appropriate basis for my determination.

Based on my review of the information sharing and consultation process followed, the Aboriginal interest 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 conclude that no additional accommodation beyond that which I have described in this rationale document is required as part of this decision. I believe that any adverse impacts upon asserted rights within the area of Pacific TSA stemming from forest development activities that occur subsequent to the AAC determination, can be appropriately mitigated or minimized through existing legislation and regulation, planning documents and meaningful engagement at the operational level.

-Nanwakolas Firsts Nation shared decision making

In the Pacific TSA, the Da'naxda'xw Awaetlatla First Nation, Tlowitsis Nation, K'omoks First Nation, Mamalilikulla Nation and Wei Wai Kum First Nation are signatory members of the Nanwakolas Reconciliation Protocol (NRP) with the Province. This protocol outlines a shared decision making process for allowable annual cut and land use objective decisions, and provides for the opportunity to make recommendations regarding allowable annual cut decisions and conditions that may apply to allowable annual cut decisions related to their asserted traditional territories.

Territories of these First Nations overlap blocks 10, 18, 19 and 20 of the Pacific TSA. As part of the normal First Nations consultation process, BCTS met with Nanwakolas First Nations several times during the timber supply review process to share information.

In June 2013, representatives of the Nanwakolas First Nations and the Province met to discuss how the shared decision making process would affect the timber supply review processes that were already underway.

In a letter dated March 31, 2014, Nanwakolas First Nations senior representatives provided the Provincial decision-maker with initial issues they wish to be considered in the upcoming TSR projects, including the Pacific TSA. These included a request for provision of an explicit sustainable supply of large cultural cedar, minimizing impact on the Nanwakolas Carbon Project and fulfilling the socio-economic objectives outlined in the Minister's April 12, 2013 letter to the chief forester. On January 29, 2016, the manager of the Forest Analysis and Data Management section, FAIB, wrote to the Nanwakolas to address the requirements of the shared decision making process. The letter provided the information package for the Pacific TSA and commented on where the other relevant and available documents could be found. The FAIB manager also provided a summary of how the Nanwakolas initial issues had been or were to be addressed.

Further discussions between the parties regarding the shared decision recommendations for the Pacific TSA occurred on September 9, 2016, following the releases of the analysis report. In January 2017, the parties met to discuss the formulation of common recommendations

regarding the AAC determination for the Pacific TSA. The final recommendations were forwarded to the chief forester in February 2017.

The joint recommendations for the determination of an AAC for the Pacific TSA specify eight recommendations for the chief forester. In summary, they are as follows:

1. *Volume outside the THLB*: If the chief forester chooses to include volume attributed to areas outside of the timber harvesting land base (THLB), such as stands considered uneconomic in the base case forecast presented by BC Timber Sales, the chief forester should specify AAC partitions, based on the spatial TSR resultant, in a manner that does not permit volume attributed to areas outside of the THLB to be harvested within the THLB.
2. *Partitions*: The chief forester should specify AAC partitions in a manner that does not permit AAC attributed to the portion of the Pacific TSA within the Skeena business area to be harvested outside of the Skeena Business Area.
3. *BCTS harvest activity*: The chief forester should instruct BC Timber Sales to manage their future harvest activity within Nanwakolas Council member First Nations territories in a manner that avoids large inter-decadal fluctuations in harvest activity.
4. *Cedar strategy*: The chief forester should request BCTS and district staff to continue working with Nanwakolas Council member First Nations in the development and implementation of a strategy to identify and manage, at both operational and strategic scales, the supply of large cultural cedar in the Pacific TSA
5. *Growth and yield*: The chief forester should instruct BC Timber Sales to stay abreast of new developments in growth and yield regarding the effects of shading from stand-level retention, and to use the best available information in future timber supply review analyses.
6. *Harvest performance*: The chief forester should instruct BC Timber Sales to monitor and assess harvest performance across the forest profile, and if redcedar and yellow-cedar are being disproportionately harvested relative to their modelled contribution in the base case, then a cedar partition should be specified.
7. *First Nations collaboration*: The chief forester should instruct BC Timber Sales and district staff to continue improving the processes for information sharing with First Nations, and to monitor the actual outcomes and impacts of forest practices on culturally heritage features and resources and on the associated assumptions used in timber supply modelling.
8. *Short-term AAC considerations*: When aligning modeling assumptions with BC Timber Sales current and planned forestry practices, the chief forester should consider the effect on the short term AAC of combined scenarios (e.g. interactions between an older minimum harvestable age and a harvest scheduling rule that includes some short term contribution from second growth forests) instead of assessing the effect of changing these assumptions individually.

Having considered the information presented, I am satisfied that the province and Nanwakolas First Nations have successfully implemented a protocol for shared decision making process pursuant to the Nanwakolas Reconciliation Protocol (RP). I have reviewed the

recommendations provided and have considered them in my determination for the Pacific TSA. I discuss my considerations of all the information provided to me, including these recommendations and other First Nations input, further in my “**Reasons for Decision**”.

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

Abnormal infestations, devastations and salvage programs

-non-recoverable losses

Unsalvaged or non-recoverable losses provide an estimate of the average annual volume of timber damaged or killed on the THLB and not salvaged or otherwise accounted for in timber supply projections. The losses result from natural events, including insects, disease, wind and wildfire.

No data specific to the Pacific TSA was available from which to estimate unsalvaged losses. As a result, data from a 2016 Coast Area Forest Health Aerial Overview Survey was used to develop annual non-recoverable loss estimates. The data was from six TSAs adjacent to blocks of the Pacific TSA. A value for non-recoverable losses from each TSA was used to develop a pro-rated estimate for the similar adjacent blocks. The total non-recoverable losses for each block were then summed, and the value (in cubic metres per year) was excluded from the base case harvest forecast. A total of 18 057 cubic metres per year were assumed to be lost across the entire TSA and this volume was excluded from harvest forecasts.

District staff have reviewed the estimates applied in the base case and indicated to me that they seem reasonable.

I have considered the information regarding the accounting in the base case for unsalvaged losses. In the absence of data explicitly collected from stands on the Pacific TSA landbase, I accept that the approach taken in the analysis to account for unsalvaged losses was reasonable and I make no adjustments in this determination. However, as mentioned in “**Implementation**”, I expect BCTS staff to collect information on appropriate loss factors from the TSA to enable more site-specific information to be available for the next timber supply review. Ensuring accurate estimates for future losses expected from various forest health factors is increasingly important, in particular given the concerns noted earlier in this document under “*climate change*”.

Reasons for Decision

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

I note that the base case showed that an initial harvest level of 688 245 cubic metres per year could be maintained for ten years before declining in two steps, of 8.5 percent to 630 080 cubic metres per year and then 2.8 percent at year 21, to the long-term harvest level of 612 250 cubic metres per year. The long-term harvest level was maintained for the remainder of the forecast.

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

- *Wildlife habitat areas* – the exclusion of an additional 400 hectares from the THLB for the management of known goshawk nest sites and 12 hectares for the management of a peregrine falcon nest site results in an overestimation of timber supply of slightly less than 0.5 percent across all time horizons.

I am also aware of the following factors that indicate an overestimation in the base case timber supply, but to degrees that cannot be quantified, as follows:

- *Cultural heritage resource reductions* – 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;
- *Managed stand yields* – the additional shading of regenerating trees resulting from the increased levels of in-block retention on 43 percent of the THLB results in a small, unquantified overestimation of timber supply in the long-term; and
- *Harvest rules* – accounting for the implications of a sequence of harvest not reflected by current practice results in an overestimation of long-term timber supply by a small, unquantified amount of less than one percent.

As well, I am aware of the following factors that indicate a potential underestimation in the base case timber supply to a degree that can be quantified, as follows:

- *Unstable terrain* – accounting for previously harvested areas in class V terrain in the TST and TSG business areas results in an underestimation of up to one percent of the long-term timber supply in the TST and TSG business areas; and, as well, the accounting for the potential to harvest up to 10 percent of the remaining unharvested class V terrain in the TST and TSG business areas results in an underestimation of the timber supply in the TST and TSG business areas by 0.8 percent across all time horizons.

I am also aware of the following factors that indicate a potential underestimation in the base case timber supply, but to a degree that cannot be quantified, as follows:

- *Existing and future roads, trails and landings* – the growth of merchantable timber on roadway area excluded from the THLB represents an underestimation of mid-term and long-term timber supply by an unquantified amount;
- *Inaccessible areas* – to the extent that the future road network has been underestimated in the base case, the accessible land base and forecasted timber supply has been underestimated to an unquantified amount;
- *Dead potential* - the volume contribution from dead stems not accounted for in the base case harvest forecast represents a small, but unquantified underestimation of short-term timber supply; and
- *Managed stand yields* - accounting for enhanced silviculture activity, including the earlier use of genetically improved seed as it was available and incremental activities such as pruning and spacing results in a small, unquantified underestimation in mid- to long-term timber supply.

In considering the factors that suggest the base case timber supply has been overestimated, I am aware that taking into account additional land base exclusions for wildlife habitat areas results in a short-term reduction in timber supply of 0.5 percent. In addition, accounting for areas set aside to protect cultural heritage resources, the shading of stems as a result of in-block retention, and the difference in stand prioritization between operations and the base case harvest rule suggests that the mid- and longer-term timber supply has been overestimated by a small amount, likely in the range of one percent. In summation, the above factors suggest an overestimation of the short-term timber supply projected in the base case of 0.5 percent and an overestimation of the long-term timber supply projected in the base case of 1.5 percent, with the majority of the underestimation attributed to the assumed timber supply in the TST and TSG business areas.

In considering the factors that suggest the base case timber supply has been underestimated, I am aware that the potential volume contribution from dead stems and an allowance of harvesting in class V terrain suggests the short-term timber supply is greater than projected by the base case by 0.8 percent. In addition, accounting for timber supply contribution from merchantable stems growing on roadways, increased level of enhanced silviculture and previously harvested areas excluded as class V terrain suggests the long-term timber supply is underestimated by 1.8 percent, with the majority of the underestimation attributed to the assumed timber supply in the TST and TSG business areas.

I must now consider the assessment of several factors that relate to the size of the land base expected to be accessed for timber harvesting, including the size of the road-accessible land base and the economically operable land base. Based on the information presented to me by BCTS and forest industry representatives as well as my observations during an overflight of parts of the TSA, I accept that there is potential for a more extensive future road network and higher-than-assumed economics for stands in the TSG and TST business areas. I do not accept that the same potential exists within the TSK Business Area.

In my determination, I will account for a potential contribution from those physically accessible stands located outside the THLB in the TSG and TST business areas that were not considered within the economically-operable land base in the base case. The basis of my adjustment is the results of a sensitivity analysis, which I described under “*economic operability*,” that projects the timber supply under the assumption that all physically accessible areas within the TST and TSG business areas will be harvestable. This sensitivity analysis suggested a potential for a short-term harvest level that was 115 015 cubic metres per year higher than base case, which I consider to represent the maximum additional volume that is potentially available from stands outside the THLB, and I consider the adjustments indicated by all other factors to be included within this amount (i.e., it is not additive to the other adjustments).

In consideration of the above, I believe it appropriate to establish an AAC for the Pacific TSA of 803 300 cubic metres, an amount equal to the initial harvest level of the base case plus 115 000 cubic metres contribution from potentially-economic stands in the TST and TSG business areas that are located outside the area mapped as THLB for the base case in the 2016 *Timber Supply Review Analysis Report – Pacific TSA*.

I am mindful that the AAC I have determined is based on a significant volume contribution from stands located outside the area mapped as THLB in the timber supply analysis. I note

that if the volume I attribute to these stands is instead harvested from stands inside the THLB, the sustainable timber supply for the TSA as a whole may be compromised. I am also mindful that historic harvest levels in TSK part of the TSA (supply blocks 28 and 29) have been well below the AAC attributed to this business area and that it is not desirable for volume attributed to the TSK to be harvested in other business areas. Therefore, to promote harvest activity in these potentially-economic areas and to ensure that volume attributed to these areas is not harvested elsewhere in the TSA, I will specify two AAC partitions which set the maximum AAC that can be taken from the more economic areas. One partition will set the maximum AAC harvestable from supply blocks within the combined TST and TSG business areas (defined as the area outside of supply blocks 28 and 29). This amount is 730 100 cubic metres, which equals the total AAC of 803 300 cubic metres minus the timber supply projected for the TSK business area of 73 200 cubic metres. Within the area of this first partition, I will specify a second partition that sets the maximum AAC harvestable from those stands mapped as THLB in the 2016 timber supply analysis. This amount equals the timber supply projected to be available from the TST and TSG business areas in the base case forecast, 615 100 cubic metres.

In making this AAC determination I have considered the joint recommendations provided to me in February 2017 by representatives from the N^{an}wak^olas First Nations and the Province under the N^{an}wak^olas Reconciliation Protocol, as presented under “N^{an}wak^olas First Nation shared decision making’. Specifically, I note that the AAC determination and AAC partitions outlined in my reasons are consistent with recommendations #1 and #2. With respect to recommendation #8, I note that my considerations include the combined effect of the factors influencing the timber supply projected in the base case and that I am taking into account in this determination. I have addressed the remaining recommendations in “**Implementation**”.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided.

It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio economic objectives of government can be best achieved by setting the AAC for the non-GBR portion of the Pacific TSA at 803 300 cubic metres.

I specify, under Section 8(5)(a) of the *Forest Act*, a partition of 730 100 cubic metres of the total AAC is attributable to the non-GBR portion of the TSA that is outside of supply blocks 28 and 29.

I further specify under Section 8(5)(a) of the *Forest Act*, a partition of 615 100 cubic metres of the AAC is attributable to the non-GBR portion of the TSA outside of supply blocks 28 and 29 and is within the area mapped as timber harvesting land base for the base case in the 2016 Timber Supply Review Analysis Report – Pacific TSA.

This determination is effective August 10, 2017, and will remain in effect until a new AAC is determined, which must take place within ten 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.

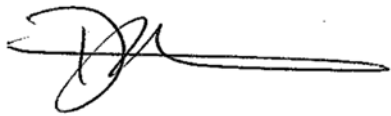
The AAC for the GBR part of the Pacific TSA is as specified in the Great Bear Rainforest (Forest Management) Act Regulation.

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 Pacific TSA.

1. *Roads, Trails and Landings* – I expect BCTS to acquire LiDAR when the opportunity arises to assist with engineering layout as well as provide information for the next timber supply analysis.
2. *Cultural Heritage Resources* – I expect BCTS to continue to work with First Nations to obtain clear quantifiable information on cultural heritage resources that can be brought into the timber supply review process.
3. *Cultural Heritage Resources* – I expect BCTS and district staff to continue working with Nānwakolas Council member First Nations in the development and implementation of a strategy to identify and manage, at both operational and strategic scales, the supply of large cultural cedar in the Pacific TSA.
4. *Information sharing with First Nations*– I expect BCTS and district staff to continue improving the processes for information sharing with First Nations, and to monitor the actual outcomes and impacts of forest practices on culturally heritage features and resources and on the associated assumptions used in timber supply modelling.
5. *Operational Adjustment Factors* – I expect FAIB staff to conduct Young Stand Monitoring in the Pacific TSA in order to assess site occupancy and better quantify appropriate OAF percentages for use in timber supply review.
6. *Objectives for Visual Resources* – I expect FAIB staff to work with other Ministry staff to determine how to better manage the data required for timber supply reviews, and develop some recommendations for implementation that ensure all data layers are accurate, updated and maintained as needed.
7. *Harvest priority and harvest rules* – I expect BCTS to develop a strategy for the transition from old growth to second growth harvesting, including an evaluation of the longer-term timber supply implications, consideration of ideal piece sizes and species composition for the future, and implications for other forest management objectives.
8. *Future harvest activity* – I expect BCTS to manage its future harvest activity within Nānwakolas Council member First Nations territories in a manner that avoids large inter-decadal fluctuations in harvest activity.
9. *Future harvest profile* – I expect BCTS to monitor and assess harvest performance across the forest profile relative to the modelled contribution in the base case forecast.

10. *Unsalvaged losses* – I expect that BCTS staff to collect information on appropriate loss factors from the TSA to enable more site-specific information to be available for the next timber supply review.



Diane Nicholls, RPF
Chief Forester
August 10, 2017

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to February 18, 2015), 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 March 1, 2017) reads as follows:

Purposes and functions of ministry

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

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

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



JUL 04 2006

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

Dear Jim:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the responsibility for determining Allowable Annual Cuts—decisions with significant implications for the province's economy, communities and environment. This letter outlines the economic and social objectives of the Crown you should consider in determining Allowable Annual Cuts, as required by Section 8 of the *Forest Act*. This letter replaces the July 28, 1994 letter expressing the economic and social objectives of the Crown, and the February 26, 1996 letter expressing the Crown's economic and social objectives for visual resources. The government's objective for visual quality is now stated in the Forest Practices and Planning Regulation of the *Forest and Range Practices Act*.

Two of this government's goals are to create more jobs per capita than anywhere in Canada and to lead the world in sustainable environmental management. The Ministry of Forests and Range supports these objectives through its own goals of sustainable forest and range resources and benefits. In making Allowable Annual Cut determinations, I ask that you consider the importance of a stable timber supply in maintaining a competitive and sustainable forest industry, while being mindful of other forest values.

The interior of British Columbia is in the midst of an unprecedented mountain pine beetle outbreak. Government's objectives for management of the infestation are contained in British Columbia's Mountain Pine Beetle Action Plan. Of particular relevance to Allowable Annual Cut determinations are the objectives of encouraging long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land use plans.

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Minister of
Forests and Range
and Minister Responsible
for Housing

Office of the
Minister

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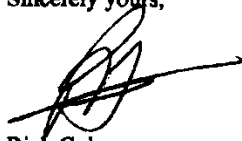
Jim Snetsinger

To assist the province and affected communities in planning their responses to the beetle infestation, it would be best to have realistic assessments of timber volumes that can be utilized economically. Therefore, in determining the best rate of harvest to capture the economic value from beetle-killed timber, I ask that you examine factors that affect the demand for such timber and products manufactured from it, the time period over which it can be utilized, and consider ways to maintain or enhance the mid-term timber supply.

The coast of British Columbia is experiencing a period of significant change and transition. In making Allowable Annual Cut determinations I urge you to consider the nature of timber supply that can contribute to a sustainable coast forest industry, while reflecting decisions made in land and resource management plans.

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

Sincerely yours,

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

Rich Coleman
Minister

Appendix 4: Minister's letter of April 12, 2013



Ref: 196701

April 12, 2013

Dave Peterson
Chief Forester and Assistant Deputy Minister
Ministry of Forests, Lands & Natural Resource Operations
Tenures, Competitiveness and Innovation Division
PO Box 9352 Stn Prov Govt
Victoria, British Columbia
V8W 9M1

Dear Dave Peterson:

The *Forest Act* gives you the responsibility and authority to make allowable annual cut determinations.

Section 8 of the *Forest Act* requires you to consider the government's social and economic objectives, as expressed by the Minister, as well as the other items listed in section 8.

As provided for in Section 1.1 of the Shared Decision Making Process agreed to as part of Schedule B, Appendix 2 (the Forestry Schedule) of the Nanwakolas Reconciliation Protocol, this letter provides government's social and economic objectives for signatory First Nations. In addition to government's social and economic objectives provided in other letters, please consider these objectives when making determinations of Allowable Annual Cut within the traditional territories of Nanwakolas First Nations:

- To share in economic development initiatives within the Traditional Territories of the Nanwakolas First Nations that facilitate, over time, the individual members of the Nanwakolas First Nations obtaining a quality of life that is equal to or better than the national Canadian average;
- To become full partners with the Province (i.e. to the fullest or maximum extent possible) in the forest sector within the Nanwakolas Traditional Territories including, but not limited to, opportunities for shared decision-making, forest tenures and revenue sharing;
- To develop significant involvement with the forest industry operating within their Traditional Territories, through the development of measures that will facilitate new relationships with industry;

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Ministry of Forests, Lands and
Natural Resource Operations

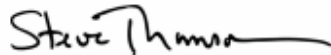
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- To significantly increase employment opportunities in the forest industry, over time, for N^anwa^kolas First Nations members, within their Traditional Territories; and
- To consider the value of forest resource development in the Traditional Territories of N^anwa^kolas First Nations when developing appropriate strategies for full N^anwa^kolas First Nations participation in the management and operation of the forest resource sector in the Traditional Territories.

Sincerely,

A handwritten signature in black ink that reads "Steve Thomson". The signature is written in a cursive style with a long horizontal stroke at the end.

Steve Thomson
Minister