

**BRITISH COLUMBIA  
MINISTRY OF FORESTS**

**Tree Farm Licence 38**

held by

**Northwest Squamish Forestry Limited Partnership**

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

**Effective August 29, 2024**

**Albert Nussbaum, RPF  
Deputy Chief Forester**

**Table of Contents**

Objective of this document.....1

Acknowledgement.....1

Statutory framework.....1

Description of the Tree Farm Licence 38.....1

History of the AAC .....2

New AAC determination.....3

Role and limitations of the technical information used.....3

Guiding principles for AAC determinations .....3

The role of the base case .....8

Base case for TFL 38.....8

Consideration of factors as required by Section 8(8) of the *Forest Act* .....10

    Land base contributing to the timber harvest.....12

        - general comments .....12

        - wildlife habitat.....12

        - Marbled Murrelet.....13

        - Northern Goshawk wildlife habitat areas .....13

        - Terrain stability.....13

        - Operability.....14

        - Stand-level biodiversity .....14

        - cultural heritage resources .....15

        - forest inventory.....16

        - site productivity estimates .....16

        - volume estimates for managed stands .....16

        - dead potential volume – 2006 coastal log grade changes .....18

        - landscape-level biodiversity .....18

        - visual quality objectives .....20

    Other information .....20

        - climate change .....20

        - cumulative effects.....22

        - undercut and unused AAC disposition plans.....22

        - recommended management strategy.....23

        - First Nations consultation .....24

Reasons for Decision.....25

Determination.....27

Implementation.....28

Appendix 1: Section 8 of the *Forest Act* .....29  
Appendix 2: Section 4 of the *Ministry of Forests and Range Act*.....33  
Appendix 3: Minister’s letter of November 24, 2021 .....34  
Appendix 4: Information sources used in the AAC determination .....36

**List of Tables**

Table 1. List of accepted factors.....10

## **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 Tree Farm Licence (TFL) 38. This document also identifies where new or better information is needed for incorporation in future determinations.

## **Acknowledgement**

For preparation of the information I considered in this determination, I am indebted to staff of the B.C. Ministry of Forests (the ‘ministry’) in the Sea to Sky Natural Resource District, the South Coast Natural Resource Region, and the Forest Analysis and Inventory Branch (FAIB). I am also grateful to the First Nations, local residents, individuals, and Northwest Squamish Forestry Limited Partnership staff and consultants who contributed to this process.

## **Statutory framework**

Section 8 of the *Forest Act* requires the chief forester to consider a number of specified factors in determining AACs for Timber Supply Areas (TSAs) and TFLs. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document. For the purposes of this AAC determination in accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester (including those required under Section 8 of the *Forest Act*).

## **Description of the Tree Farm Licence 38**

TFL 38 is held by Northwest Squamish Forestry Limited Partnership, a company that is wholly owned by the Squamish Nation. The TFL was assigned to the Partnership in December 2005, following transfer by sale from the previous licensee, International Forest Products Limited (Interfor).

The TFL is located on the mainland coast of B.C., within the Sea to Sky Natural Resource District, approximately 25 kilometers north of Squamish. The TFL covers an area of approximately 177 380 hectares and is near the communities of Squamish, Whistler, and Pemberton, all of which are located within the Squamish Lillooet Regional District.

TFL 38 lies within the Coastal Western Hemlock, Mountain Hemlock, and the Coastal Mountain-heather Alpine biogeoclimatic ecosystem classification (BEC) zones. Lower elevation climate is characterized by warm and dry summers and short winters with intermittent wet snowstorms, with prolonged snowpack in higher elevations. Annual precipitation ranges from 1500 to 3000 millimeters. Approximately 72 percent of the TFL is comprised of non-forested, steep mountainous terrain, and ice fields.

Management of public access and recreation use is an important consideration within the TFL. Recreation use is high, with both public and commercial recreation operators utilizing the area for a variety of activities.

The Squamish Nation (Skwxwú7mesh Úxwumixw), Lil’wat Nation, and the Tsleil-Waututh Nation have territories within the TFL. Additional First Nations with periphery territory overlap with TFL 38 include the Klahoose First Nation and the St’at’imc Chiefs Council. TFL 38 includes

several areas identified by First Nations as having historic and contemporary cultural significance. This significance is reflected in approved land use plans and forest management practices.

## **History of the AAC**

Harvesting and forest management activities have occurred in the area now covered by TFL 38 since the mid-1950s. The TFL was first issued in 1961 to Empire Mills Limited with an AAC for *Management Plan No. 1* of 117 516 cubic metres per year. The AAC increased to 152 912 cubic metres per year in 1964 and increased to 263 348 cubic metres per year in 1969.

Empire Mills Limited was amalgamated in 1981, under the name Canim Lake Sawmills Limited, with Wellington Colliery Company Limited, Timberland Development Company Limited, and Canim Lake Sawmills Limited. In 1982 Canim Lake Sawmills Limited was acquired by, and became part of, Weldwood of Canada Limited. In 1989, under the *Forest Amendment Act* (1988), the AAC available to the TFL holder was reduced by 13 118 cubic metres per year. This volume was apportioned to the Small Business Forest Enterprise Program (SBFEP), now called BC Timber Sales (BCTS).

On February 27, 1995, TFL 38 was transferred to Interfor. As a result of the transfer of the TFL from Weldwood of Canada Limited to Interfor, the portion of the AAC attributable to Schedule B land was reduced by 12 463 cubic metres per year. This volume was apportioned to SBFEP, bringing the total AAC apportioned to SBFEP to 25 581 cubic metres per year. In March 1998, though Instrument #10, 24 484 hectares within the proposed Clendenning Park were removed from the TFL. Following the deletion the Minister reduced the SBFEP apportionment from 25 581 cubic metres per year to 13 118 cubic metres per year. In 1998, the AAC was reduced to 250 500 cubic metres per year.

On January 1, 2005, under the *Forest Revitalization Act*, the AAC available to the TFL holder was reduced by 29 106 cubic metres per year. This volume was apportioned to BCTS. On December 22, 2005, the TFL was transferred from Interfor to the current owner, Northwest Squamish Forestry Limited. On January 1, 2006, a second Order was issued under the *Forest Revitalization Act*. This Order reduced the AAC available to the licensee by 98 823 cubic metres per year. On February 16, 2006, through Instrument #14, 256 hectares of Schedule A (private) land was removed from the TFL. In June 2006, the Minister and the Squamish Nation signed the Squamish Nation Interim Agreement on Forest and Range Opportunities for up to 98 800 cubic metres per year within the TFL.

On March 28, 2007, the deputy chief forester determined the new AAC for TFL 38 at 250 500 cubic metres per year. Of this AAC, 79 500 cubic metres per year was attributable to the Wild Spirit Places (WSPs) pending resolution of their status under the *Sea-to-Sky Land and Resource Management Plan* (LRMP).

Between the periods of 2008 and 2011, various Conservancies, Wildland Zones, Cultural Management Areas, and conditional land use designations were established for the three WSP's, Nsiwix - nitem tl'a sutch (Upper Elaho), Newx Ayantsut (Sims Creek), and Esté-tiwilh (West Side Squamish River). The adjustments to the Sea-to-Sky LRMP have been fully accounted for in Northwest Squamish Forestry Limited's *TFL 38 Management Plan No. 10*.

## **New AAC determination**

Effective August 29, 2024, the new AAC for TFL 38 will be 117 500 cubic metres per year. There are three partitions that are specified in this AAC:

1. Below 1200 metres elevation: A maximum of 102 500 cubic metres per year may be harvested below 1200 metres in elevation.
2. Old Stands: Below 1200 metres in elevation, a maximum of 30 750 cubic metres per year (30 percent) may be harvested from stands older than 250 years.
3. Not Old Stands: Below 1200 metres in elevation, a maximum of 71 750 cubic metres per year (70 percent) may be harvested from stands 250 years and younger.

This new AAC is approximately 53 percent lower than the AAC in place prior to this determination of 250 500 cubic metres per year and 39 percent greater than the average annual harvest level since the last AAC determination in 2007. It will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination.

## **Role and limitations of the technical information used**

Section 8 of the *Forest Act* requires the chief forester, in determining AACs, to consider biophysical, social, and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs related to inventory, growth and yield, and management practices. The factors used as inputs to timber supply analysis have differing levels of uncertainty associated with them, due in part to variation in physical, biological, and social conditions.

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

In determining the AAC for TFL 38 I have considered the known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

## **Guiding principles for AAC determinations**

Given the substantial number of periodic AAC determinations required for B.C.'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 B.C.'s chief foresters and deputy chief foresters. However, in any specific circumstance in a determination where I consider it necessary to deviate from these principles, I will explain my reasoning in detail.

When considering the factors required under Section 8, I am also aware of my obligation as a steward of the forests of British Columbia, of the mandate of the Ministry of Forests ("the Ministry") as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest Act*, *Forest and Range Practices Act* (FRPA), and the *Professional Governance Act*.

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

These guiding principles establish a framework for AAC decision-making with consideration to the following: advancing reconciliation with Indigenous people; responding to uncertainties; the incorporation of forest landscape planning information (including any legal orders associated with forest management), cumulative effects, and climate change.

#### Reconciliation with Indigenous people

The Government of B.C. has committed to true and lasting reconciliation with Indigenous people. The *Declaration on the Rights of Indigenous Peoples Act* of 2019 (the '*Declaration Act*') creates the path forward for aligning provincial laws with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Recognizing that reconciliation and changes to policies, programs, and legislation take time, any interim processes undertaken for AAC determinations should be responsive to the information and issues raised by Indigenous people to the extent possible within the existing legislative framework for AAC determinations. Interim collaborative engagement processes will seek to move beyond the legal duty to consult, align with relevant agreements between First Nations and the Province (including commitments regarding stewardship or resource management), promote capacity building within Indigenous communities, and provide a clear and transparent understanding of the decision-making process.

Where the nature, scope and geographic extent of Aboriginal rights and title have not been established, the Province has a constitutional obligation to consult with First Nations in a manner proportional to the strength of any claimed Aboriginal rights (including title) and the degree to which they may be affected by the decision. The Province also has an obligation to consult with First Nations regarding their treaty rights. In this regard, when making an AAC determination I will give consideration to the following information:

- (i) information provided to First Nations to explain the timber supply review process and analysis results;
- (ii) information, including Indigenous Knowledge, brought forward through consultation or a collaborative engagement process with respect to Aboriginal Interests, and how these interests may be impacted by an AAC decision;
- (iii) any strategic level plans, operational plans, or management information that describe how Aboriginal Interests are addressed through specific actions and forest practices;
- (iv) existing relevant agreements and policies between First Nations and the Province; and,
- (v) other information regarding the potential impact of an AAC decision on the ability of Indigenous communities to meaningful exercise of Section 35 rights as recognized in the *Constitution Act* (1982), such as information about cumulative effects.

Aboriginal Interests that may be impacted by AAC decisions will be addressed consistent with the scope of authority granted to the chief forester under Section 8 of the *Forest Act*, and with consultation obligations defined in court decisions. When information is brought forward that is outside of the chief forester's scope of statutory authority, this information will be forwarded to the appropriate decision makers for their consideration. Specific considerations identified by First Nations in relation to their Aboriginal Interests that could have implications for the AAC

determination are addressed in the various sections of this rationale where it is within the statutory scope of the determination.

The timber on established Aboriginal title lands (meaning Aboriginal title declared by a court or defined under an agreement with necessary federal and provincial implementation legislation), Treaty Settlement Lands or Indian Reserves, is no longer provincial timber. Consequently, it does not contribute to the AAC of the management unit overlapped by those lands. Prior to establishment of Aboriginal title, it is not appropriate for the chief forester to speculate on how potential establishment of Aboriginal title in an area could affect timber supply, given uncertainties about the scope, nature and geographic extent of title. Unless land has been established to be Aboriginal title land, Treaty Settlement Land or reserve land it remains as provincial land managed by the Province and will contribute to timber supply. However, where there is clear intent by government to recognize lands as title land that are yet to be finalized, I will consider information that is relevant to the decision in a manner that is appropriate to the circumstances. The requirement for regular AAC reviews will ensure that future determinations address ongoing changes to the land base.

#### 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. The following are two ways of addressing the uncertainty of information available to support an AAC determination:

- (i) undertaking analyses to evaluate the significance of uncertainties associated with available information and assessing the social, economic, and environmental risks associated with a range of possible decisions; and,
- (ii) re-determining AACs regularly to ensure they incorporate current information and knowledge, and greater frequency in cases where projections of short-term timber supply are not stable and/or substantial changes in information and management are occurring.

In considering the several 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 that (as closely as possible) are a reasonable extrapolation of current practices. It is not appropriate to base decisions on proposed or potential practices that could affect the timber supply but are not consistent with legislative requirements and not substantiated by demonstrated performance.

It is not appropriate to speculate on timber supply impacts that may eventually result from land-use designations not yet finalized by government. Where specific protected areas, conservancies, or similar areas have been designated by legislation or by order in council, these areas are deducted from the land base supporting timber harvesting and are not considered to contribute harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover that helps meet resource management objectives such as biodiversity.

Where appropriate, the chief forester will consider information 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 an alternative strategy for dealing with information uncertainty is to generally reduce AACs in the interest of caution. On its own, this precautionary approach is not a complete framework for decision making under uncertainty. It is one tool that could be used to address the risk of serious harms in situations of deep uncertainty or significant deficiencies in information. However, the precautionary approach does not consider the full



spectrum of values or extensive range of research and information utilized by the chief forester. For these reasons, AAC determinations more appropriately follow a decision process utilizing analyses of current land and management practices and the exploration of the potential effects of uncertainties, rather than relying on an overriding precautionary approach.

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

### Forest Landscape Planning

In addressing the factors outlined in Section 8 of the *Forest Act*, I will consider relevant available information on timber and non-timber resources in the management unit, including information on the interactions among those resources and the implication for a sustainable timber supply.

AAC determinations will be made in the context of new forest landscape plans and legal orders that establish forest management expectations. These plans and orders direct forestry activities and guide the stewardship of B.C.'s public land and resources, have been established with an understanding of the relationships among the various components of forest management systems, and follow deliberative processes and laws designed to achieve a balance of natural resources values and benefits.

As is the case for land use and management planning in general, it is beyond my statutory authority to speculate on final outcomes where there are preliminary but not yet finalized and formalized land use zones or management objectives. If the timber supply implications of final designations are substantial a new AAC determination prior to the legislated deadline may be warranted.

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

### Cumulative Effects

Cumulative effects (CE) are changes to environmental, social and economic values caused by the combined effect of past, present and potential future human activities and natural processes. In the context of AAC determinations, I am aware of the mandate provided by the Minister of Forests (FOR) which tells me to ensure that my AAC determinations continue to incorporate the best available information on the CE of multiple activities on the land base. Where the CE of timber harvesting and other land-based activities indicate a risk to natural resource values, my determinations should identify those risks for consideration in land-use planning. I am also asked to consider ways in which my AAC determinations could encourage actions or practices to mitigate risks to natural resource values.

Section 8 of the *Forest Act* only authorizes the chief forester to make decisions on allowable harvest levels, not to change or institute new management regimes for which other statutory decision makers have specific authority. However, cumulative effects information can highlight

important issues and uncertainties in need of resolution through land use planning which I can note and refer to those responsible for such planning.

Where a cumulative effects assessment has suggested that an important value is at risk and that a reduced harvest level or implementation of an AAC partition could help to reduce that risk, I will appropriately factor these into my AAC determination. I may also identify actions or implementation instructions that would mitigate risk or accommodate potential impacts to Aboriginal Interests. In this case, I will include expectations that Ministry staff work with relevant interests to address the issues identified and encourage forest licensees to follow the recommendations of CE assessments.

As with all management issues, additional information and any changes can be incorporated into subsequent AAC determinations.

### Climate Change

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

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

I note, however, that even with better information on climate change, in many cases there will be a range of reasonable management responses. For example, it is not clear if either increases or decreases to current harvest levels would be appropriate in addressing potential future increases in natural disturbance due to climate change, which are likely in some areas. Hypothetically, focused harvests in at-risk forests could forestall losses of timber and allow for planting of stands better adapted to future conditions. Conversely, lower harvest levels and the use of partitions in my AAC decisions could provide buffers against uncertainty. The appropriate mix of timber supply management approaches is ultimately a social decision.

Due to the uncertainty surrounding impacts on the AAC from climate change, it is important to encourage dialogue to develop climate change mitigation and adaptation strategies and remain open to new opportunities for forest management. Deciding on the preferred management approach will involve consideration of established climate change strategies, and available adaptation and mitigation options together with social, economic, cultural, and environmental objectives. The timber supply analysis is a useful tool to determine the potential changes to the frequency, intensity, and scope of natural disturbances under climate change; and for exploring options and trade-offs. Any management decisions about the appropriate approach and associated practices will be incorporated into future AAC determinations. The requirement for regular AAC reviews will ensure continuous improvement of the information and knowledge on climate change and ensure the development of a responsive decision-making process to emerging natural resources issues.

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

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

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

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

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

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

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

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

## **Base case for TFL 38**

The timber supply analysis was conducted by Forest Ecosystem Solutions Limited (FESL) on behalf of the licence holder as part of the *TFL 38 Management Plan No. 10*. It was completed using a Forest Simulation and Optimization System (FSOS) forest estate model, which is approved by the FAIB for use in TSR.

Based on the review by FAIB staff, as well as my own experience reviewing results from this and similar models, I am satisfied that the FSOS model can provide an appropriate projection of timber supply for this determination.

Harvest projections for the base case were established by determining the maximum sustainable even-harvest flow and achieving the highest short-term level that did not compromise the sustainability of the mid- and long-term harvest level. Transitions to a higher or lower harvest level were not allowed to exceed 10 percent per decade.

In the base case, harvest scheduling was based on the highest volume first harvest rule. The contribution of stands older than 100 years of age was limited to a maximum of 50 000 cubic metres per year for the first 80 years of the projection. The harvest limit on stands older than 100 years was imposed to reflect current practice and economics within the TFL at the time the base case analysis was completed.

The base case harvest projection begins in 2018 where an initial harvest level of 119 430 cubic metres per year can be maintained for 10 years before declining to 107 430 cubic metres per year. The long-term level of 111 460 cubic metres per year is reached in year 101 of the projection.

In the *TFL 38 Management Plan No. 10*, the licence holder also presented an alternative timber supply scenario that separated the harvest into a low (below 1200 metres) and high elevation (above 1200 metres) harvest projection. In this alternative scenario, the harvest of low elevation stands older than 100 years old was limited to 62 000 cubic metres per year for 50 years.

The alternative timber supply scenario was the proposed management strategy of Northwest Squamish Forestry Limited. It was created to reflect the economics of harvesting in lower elevations, with a separate high elevation partition for opportunity timber during periods of high lumber prices. The alternative scenario also reflects updated harvesting practices in low elevation stands older than 100 years old.

In the alternative timber supply scenario, an even-flow harvest level of 110 950 cubic metres per year can be maintained in the low elevation stands (below 1200 metres) throughout the projection. In the high elevation stands (above 1200 metres), there was no attempt to limit the decadal increases or decreases in the harvest level. A harvest level of 38 864 cubic metres per year can be maintained for 20 years. The harvest level then declines in a series of steps until the mid-term harvest level of 2014 cubic metres is reached in year 41 and the long-term harvest level of 5425 cubic metres per year is reached in year 136. In total, the alternative timber supply scenario can maintain a harvest level of 149 816 cubic metres per year for the first 20 years by adding the low elevation and high elevation stand contributions together.

In my determination, I have also considered several sensitivity analyses. A sensitivity analysis examines how changes in assumptions affect the projected timber supply. These analyses have been helpful as I made specific considerations and reasoning in my determination as documented in the following sections.

As discussed under '*recommended management strategy*', I believe that the licence holder's alternative timber supply scenario provides the most appropriate representation of current harvesting practices within the TFL. I am satisfied that their recommended management strategy, and the other analyses as noted and described, represent the best information available to me respecting various aspects of the current projection of the timber supply in this TFL, and as such they are suitable for reference in my considerations in this determination. Unless otherwise stated, for the remainder of this document I will reference the licence holder's recommended management strategy, the alternative timber supply scenario, as the reference scenario for my determination. As most of the timber harvesting in TFL 38 occurs below 1200 metres in

elevation, I will consider the pressures on timber supply in relation to the low elevation alternative timber supply projection of 110 950 cubic metres per year.

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

I have reviewed the information for the factors required to be considered under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the analysis is a reasonable reflection of current legal requirements, demonstrated forest management, and the best available information, and uncertainties about the factor have little influence on the timber supply projected in the alternative timber supply projection, no discussion is included in this rationale. These factors are listed in Table 1.

*Table 1. List of accepted factors*

<b><i>Forest Act</i> section and description</b>	<b>Factors accepted as modelled and not discussed further in the rationale</b>
8(8)(a)(i) the composition of the forest and its expected rate of growth on the area	<ul style="list-style-type: none"> <li>• TFL Area</li> <li>• Non-forest Areas</li> <li>• Roads and Utility Corridors</li> <li>• High Severity Burned Areas</li> <li>• Sea-to-Sky Land and Resource Management Plan – Upper Elaho Special Cultural Management Area</li> <li>• Sea-to-Sky Land and Resource Management Plan – Wildland Areas</li> <li>• Sea-to-Sky Land and Resource Management Plan – Cultural Places</li> <li>• Sea-to-Sky Land and Resource Management Plan – West Side of the Squamish River Floodplain</li> <li>• Sea-to-Sky Land and Resource Management Plan – Elaho and Squamish Rivers Floodplain</li> <li>• Ungulate Winter Range – Mountain Goat</li> <li>• Ungulate Winter Range – Mule Deer and Black-tailed Deer</li> <li>• Ungulate Winter Range – Moose</li> <li>• Wildlife Habitat Area – Grizzly Bear</li> <li>• Wildlife Habitat Area – Spotted Owl</li> <li>• Bald Eagle Habitat</li> <li>• Old Growth Management Areas</li> <li>• Recreation Sites and Trails</li> <li>• Research Installations</li> <li>• Riparian Management Areas</li> <li>• Deciduous-leading Stands</li> <li>• Sites with Low Timber Growing Potential</li> <li>• First Nations Village Sites</li> <li>• Archaeological Sites</li> <li>• Age Class Structure and Species Profile</li> <li>• Volume Estimates for Existing Stands</li> </ul>

<b><i>Forest Act</i> section and description</b>	<b>Factors accepted as modelled and not discussed further in the rationale</b>
8(8)(a)(ii) the expected time that it will take the forest to become re-established following denudation	<ul style="list-style-type: none"> <li>Operational Adjustment Factors</li> <li>Silviculture Management Regime</li> <li>Regeneration Delay</li> <li>Not Satisfactorily Restocked Areas</li> </ul>
8(8)(a)(iii) silviculture treatments to be applied to the area	<ul style="list-style-type: none"> <li>Juvenile Spacing</li> <li>Silviculture Systems</li> </ul>
8(8)(a)(iv) the standard of timber utilization and the allowance for decay, waste, and breakage expected to be applied with respect to timber harvesting on the area	<ul style="list-style-type: none"> <li>Decay, Waste, and Breakage for Existing Natural Stands</li> <li>Utilization Levels</li> <li>Volume Exclusions for Mixed-Species Stands</li> <li>Minimum Harvest Criteria</li> </ul>
8(8)(a)(v) constraints on the amount of timber produced by use of the area for purposes other than timber production	<ul style="list-style-type: none"> <li>Ungulate Winter Range – Conditional Harvest</li> <li>Maximum Cutblock Size and Adjacency</li> </ul>
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	<ul style="list-style-type: none"> <li>Harvest Performance</li> </ul>
8(8)(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area	
8(8)(d) economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia	<ul style="list-style-type: none"> <li>Economic and Social Objectives Expressed in the Minister’s Letter</li> <li>Summary of Public Input</li> </ul>
8(8)(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	<ul style="list-style-type: none"> <li>Abnormal Infestations and Devastations</li> </ul>

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

**Forest Act Section 8 (8)**

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

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

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

Land base contributing to the timber harvest

*- general comments*

The total TFL area used in the timber supply analysis was 177 838 hectares. Accounting for updates to private land and Indian Reserves, the total area of TFL 38 is currently 177 380 hectares. After removing areas not managed by the province, and non-forest and non-productive areas, the remaining forested area is 46 163 hectares (26 percent of the TFL area). This area is referred to as the analysis forest land base (AFLB) and contributes to timber and non-timber objectives.

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.

As part of the process used to define the THLB, a series of deductions were made from the AFLB. These deductions account for biophysical, economic, or ecological factors that reduce the forested area available for timber harvesting. For TFL 38, the THLB that is available after deductions are applied is 21 108 hectares. The THLB represents about 11.9 percent of the total area of the TFL and about 45.7 percent of the AFLB.

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

For this determination, I accept that the approach used to determine the THLB for the TFL 38 alternative timber supply projection was appropriate.

*- wildlife habitat*

Wildlife habitat areas (WHA) are established to provide habitat for identified wildlife species that are at risk or are of regional importance. Management objectives may prevent harvest or set conditions under which harvesting can occur.

In TFL 38, there are approved WHAs for Grizzly Bear, Spotted Owl, and Marbled Murrelet. The gross area of WHAs where no harvesting is allowed is 6141 hectares. These areas were removed from the THLB in the alternative timber supply projection.

In February 2018, the provincial government announced a plan for further protection of Northern Goshawk and Marbled Murrelet nest and breeding areas through the release of Implementation Plans for each species.

- *Marbled Murrelet*

Marbled Murrelet have specific habitat requirements such as nesting in old-seral stage coniferous forests with large trees that contain mossy platforms, with variable canopy structure and small canopy gaps. On November 19, 2021, an Order under the Land Use Objectives Regulation of the *Land Act* established the additional aspatial amount of suitable habitat to be protected on provincial Crown land, by landscape unit (LU) aggregate and LU portion for Marbled Murrelet. On December 2, 2021, a revised Notice was issued under Section 7 of the Forest Planning and Practices Regulation (FPPR) to guide the future establishment of spatially defined reserves in WHAs and old growth management areas (OGMA) for the protection of Marbled Murrelet habitat.

TFL 38 overlaps with two LUs, the Upper Squamish and Elaho. The Section 7 revised Notice for Marbled Murrelet specified a target amount of 567 hectares, and a minimum suitable habitat amount of 454 hectares in the Upper Squamish LU. The Notice did not specify targets for the Elaho LU. As the final location and distribution of these new protected areas has not been determined, the alternative timber supply projection did not consider the 2021 *Land Act* Order or FPPR Section 7 Notice.

Current WHAs for Marbled Murrelet cover a total forested area of 297 hectares, which is 157 hectares below the minimum suitable habitat amount specified in the Notice. I note that Marbled Murrelet suitable habitat likely overlaps with areas removed from the THLB in the analysis, such as riparian areas, OGMAs, Wildland Areas, and wildlife tree retention areas, but as Marbled Murrelet have very specific habitat requirements, the overlap has not been quantified.

For this factor, I note that the legal requirement for Marbled Murrelet habitat protection has been defined, but as it has not yet been spatialized, the alternative timber supply projection did not account for the 2021 Notice. As discussed under ‘**Reasons for Decision**’, I will consider that the low elevation alternative timber supply projection was overestimated by an unquantified amount to account for the legal Marbled Murrelet FPPR Section 7 Notice.

- *Northern Goshawk wildlife habitat areas*

The *2018 Implementation Plan* also contained details for the recovery of Northern Goshawk. Currently, there is a draft WHA for Northern Goshawk created by the Ministry of Water, Land and Resource Stewardship that overlaps with TFL 38, but it has not been finalized or approved.

Consistent with my ‘*Guiding Principles for AAC Determination*’, it is not appropriate for me to speculate on the timber supply impact that may arise from decisions that have yet to be made. I will not make any reductions for the proposed WHA, as future AAC decisions will account for any Northern Goshawk WHAs once they become approved.

- *Terrain stability*

Landslide hazard information is useful for planning safe operations and avoiding environmental issues. Terrain stability mapping (TSM) is a method of delineating areas of slope stability with respect to stable, potentially unstable, and unstable terrain within a particular landscape.

In the analysis, a gross area of 5902 hectares were identified as unstable class V terrain and these areas were fully excluded from the THLB. A gross area of 18 474 hectares were classified as potentially unstable class IV terrain. Ten percent of the area classified as class IV terrain was removed from the THLB.

Current harvest performance information in potentially unstable class IV terrain was not provided by the licence holder. In examining the potentially unstable class IV terrain reductions, I note that the 10 percent reduction made for TFL 38 is lower in comparison to reductions made in other



similar coastal management units. Therefore, I conclude that there is uncertainty with the reductions made for potentially unstable class IV terrain. As discussed under ‘**Reasons for Decision**’, I will consider that the low elevation alternative timber supply projection may be overestimated by an unquantified amount.

*- Operability*

The amount of productive forest land that is economically and physically accessible by forestry operators is a key consideration in determining the available timber supply. Operability is the presence or absence of physical barriers or limitations to harvesting, applicable logging methods, and the merchantability of stands.

In TFL 38, an operability assessment was completed in 1996 and revised in 2001. In the analysis, a gross area of 140 731 hectares was classified as inoperable and removed from the THLB. Areas classified as conventional, helicopter, and marginal contributed to the THLB.

In the analysis, there was an AFLB area of 5937 hectares classified as helicopter operable and 649 hectares classified as marginally operable. A sensitivity analysis removed all stands classified as marginally operable and stands classified as helicopter operable that were comprised of hemlock and balsam from the THLB, resulting in a total THLB reduction of 1721 hectares. Removing all hemlock and balsam stands from the marginally operable and helicopter operable THLB resulted in a 1.7 percent decrease in the base case short-term timber supply, no impact on mid-term timber supply, and a 0.5 percent decrease in long-term timber supply.

The Ministry’s Electronic Commerce Appraisal System shows that there has been no helicopter harvesting between 2018 to 2023.

The harvest contribution from the helicopter operability class in the alternative timber supply scenario increases from about four percent in the first 10 years, to approximately 14 percent from year 15 to 70. Additionally, the 2023 *Provincial Timber Management Goals, Objectives, and Targets for TFL 38* report indicates that from 2018 to 2022, about 8 percent of the harvesting took place on slopes ranging from 51 to 60 percent and approximately 3 percent occurred on slopes greater than 60 percent.

It is important that the current operational harvest profile aligns with the profile modelled in the analysis. If the current underperformance in the helicopter operability class continues, it could indicate that the THLB modelled in the analysis is operationally unattainable, resulting in an overestimation of timber supply. Under ‘**Implementation**’, I ask the licence holder to monitor harvest performance in the helicopter operability category. I will make no adjustments at this time, however, if harvest performance in the helicopter operability class does not increase over the term of this decision, in future determinations it should be removed from the operable land base and not contribute to timber supply.

*- Stand-level biodiversity*

Stand-level biodiversity management includes the retention of important structural attributes in managed stands such as coarse wood debris, tree species diversity, and wildlife trees. The FPPR requires that enough suitable trees be retained at the stand level to provide wildlife habitat and biodiversity. Specifically, the FPPR requires licensees to retain 7 percent of the total area harvested over a twelve-month period as wildlife tree retention area (WTRA) with a minimum of 3.5 percent retained within each cutblock.

In the analysis, the minimum FPPR requirement of seven percent was assumed to reflect the group and dispersed retention practices used in the TFL. It was also assumed that of that seven percent, two percent of the area overlaps with other netdowns, such as riparian reserve

zones, resulting in a five percent netdown applied aspatially in the analysis to account for existing and future WTRA.

For the period of 2015 to 2022, the average WTRA percentage identified in the Reporting Silviculture Updates and Land Status Tracking System (RESULTS) was 14 percent. When WTRA levels are based on licensee practices instead of the FPPR requirement of seven percent, and overlaps with areas removed earlier in the netdown process are factored in, timber supply is approximated to be overestimated by 4.6 percent.

I conclude that the alternative timber supply projection does not reflect the licensee management practices for WTRA. Under ‘**Reasons for Decision**’, I will consider a decrease of 4.6 percent to the low elevation alternative timber supply projection to account for the underestimation of area removed for stand-level retention.

*- cultural heritage resources*

The Land Use Objectives for the Sea-to-Sky LRMP Order defines cultural heritage resources as, “trees, wild plant foods, botanical medicines, and other forest resources, including wildlife, that are utilized by a First Nation for food, social, treaty or ceremonial purposes, and culturally modified trees and other historical and archaeological artifacts, sites and locations that are important to the cultural practices, knowledge, spirituality, and heritage of a First Nation”.

The Order includes objectives for Cultural Management Areas (CMA), which are areas identified by First Nations as having historic and contemporary cultural significance. There are three CMAs within TFL 38, the Upper Elaho Special CMA, Nexw Áyantsut (Sims Creek) CMA, and Estétiwilh (West Squamish) CMA. Within the Upper Elaho Special CMA, old growth forest must be maintained. In the analysis, all stands greater than 250 years of age within the Upper Elaho Special CMA were removed from the THLB.

Within the Nexw Áyantsut (Sims Creek) and the Estétiwilh (West Squamish) CMAs, cultural heritage resources must be conserved. Additionally, opportunities for First Nations to practice traditional harvesting for food, social, ceremonial, and spiritual purposes must be maintained. In the analysis, a 20 percent reduction was made to the THLB that overlaps with the Nexw Áyantsut (Sims Creek) and Estétiwilh (West Squamish) CMAs. No other land exclusions were made to account for cultural heritage resources, as it was assumed that their protection would be addressed through land use objectives such as Cultural Places, Wildland Areas, and the management of other values such as WTRA and riparian areas.

Through discussions with the licence holder, I am aware that timber harvesting may not occur within the Nexw Áyantsut (Sims Creek) and Estétiwilh (West Squamish) CMAs, given the cultural significance of these areas. Under ‘**Implementation**’, I request the licence holder to monitor the amount of timber harvesting that occurs within the Nexw Áyantsut (Sims Creek) and Estétiwilh (West Squamish) CMAs.

I am also aware of land use planning currently occurring with the Squamish Nation that may have a future impact on the THLB. Future AAC decisions will account for land use plan revisions and will reflect harvesting practices within the CMAs based on the monitoring information collected over the next decade. If there is no harvesting within the CMAs over the next decade, these areas will be removed from the THLB in the next TSR. For this determination, I will not make any adjustments to the alternative timber supply projection.

*- forest inventory*

The Vegetation Resources Inventory (VRI) is the standard for forest cover inventories in the province of B.C. The VRI is a photo-based, two-phase program. Phase I delineates polygons of homogenous forest cover types through photo interpretation and provides estimates of the forest attributes for each polygon. Phase II is ground sampling carried out to verify the accuracy of stand volumes, species composition, and other key Phase I forest attributes.

The forest inventory used in this analysis was originally completed by Weldwood of Canada Ltd. in 1981. Inventory attributes (e.g., age, height, volume) in this data were projected to 2018 and timber harvesting depletions were updated to 2018. There is no Phase II VRI audit report completed for TFL 38.

I note that the forest inventory for TFL 38 is dated and there is no Phase II audit assessing the quality of the information. As this introduces a degree of uncertainty in the timber supply projection, under '**Implementation**', I urge the licence holder to complete a new forest inventory of the TFL or audit the existing forest inventory to validate its quality.

*- site productivity estimates*

The measure of forest site productivity used in B.C. is site index. For a particular species, site index is the height of the largest diameter site tree at a breast-height age of 50 years. Growth and yield models require potential site index as a necessary input to develop projected volume yield tables.

In the analysis, volume estimates for natural stands used site index estimates provided in the VRI, while volume estimates for managed stands used site index estimates from the Provincial Site Productivity Layer (PSPL). The PSPL is a database of site index values for commercial species, which can be linked to the ecological, biophysical, and/or climatic conditions of sites across the province.

There are two sources of site index estimates in the PSPL. The first source uses the site index by biogeoclimatic ecosystem classification (SIBEC) model, which provides site index estimates based on ecosystem classifications from predictive ecosystem mapping (PEM) or terrestrial ecosystem mapping (TEM). The other source is the biophysical model developed by FAIB, which is a regression equation that predicts site index based on BEC and biophysical variables, such as slope, aspect, elevation, and climate variables.

The biophysical model is applied where the PEM or TEM data required for SIBEC are not available or are not reliable. There is very little area covered by approved PEM/TEM mapping in TFL 38, so the majority of the TFL (> 99 percent) has PSPL site index values produced by the biophysical model.

I acknowledge that it is preferable to use SIBEC estimates of site index but since the necessary PEM/TEM mapping is not available for this TFL, it is appropriate to use the biophysical model. I note that the reliance on the biophysical model adds uncertainty to the alternative timber supply projection and I will discuss this further in '*volume estimates for managed stands*'.

*- volume estimates for managed stands*

Managed stands are those stands that have already been harvested and reforested. Analysis units for managed stands are based on BEC variants and silviculture eras. An analysis unit is a grouping of similar forest area with the objective of simplifying the analysis and the interpretation of analysis results. In the analysis, stands established since 1967 were considered managed. To reflect the changes in forest management over time, three silviculture eras were identified: stands

established between 1967 and 1992, stands established since 1992 and future stands, and burnt stands.

The Tree and Stand Simulator (TASS) version II was used to project the growth and yield of managed stands. Yield tables for the 1967 to 1992 era were generated with TASS, using the natural regeneration function. I note that the current Ministry standard is to model stands established prior to 1987 without a silviculture history record using the Variable Density Yield Projection (VDYP) model, due to the lack of stocking standards prior to 1987, differences in planting techniques, and differences in actual planting stock quality. Therefore, a concern was raised that the use of TASS may overestimate the growth and yield of stands established in the 1967-1992 era.

Genetic gain is an indication of the quality of genetically improved seed, as represented by a percentage volume increase expected near rotation age. Licensees are obliged by regulation to use the best available seed source when regenerating sites with planted stock. Information on the use of select seed and the associated genetic gains are available from the Seed Planning and Registry (SPAR) application of the Forest Improvement and Research Management Branch.

In the analysis, records from RESULTS and SPAR were used to assign a weighted average genetic gain by species for managed stands established after 1992 and for future stands. The weighted average genetic gain for select western redcedar seed ranged from 0.00 to 0.15 percent and Douglas-fir ranged from 0.69 to 1.83 percent, depending on BEC subzone.

The 2023 *Provincial Timber Management Goals, Objectives, and Targets for TFL 38* report indicates that since 2018 genetic worth values have been increasing from the 2010 to 2017 levels. In 2022 the average genetic gain for seed used in the TFL was about 10 percent. No sensitivity analyses were done to test the effect of using the more recent and projected values for genetic gain, but staff informed me that there would be an increase in the long-term timber supply if the higher genetic gain values were used. I expect that if climate-based seed transfer rules were observed there could be a further increase in timber supply.

The timber supply in TFL 38 is reliant on managed stands, as the contribution of stands older than 100 years old was limited in the low elevation alternative timber supply scenario to 62 000 cubic metres per year. Additionally, I note that the minimum harvestable criteria sensitivity analyses that were presented in the licence holders analysis report demonstrated that the timber supply projection is very sensitive to changes in managed stand minimum harvest criteria requirements.

Based on my review of the information noted above and on my own experience with growth and yield projection models, I conclude that the best available information was used to generate the managed stand yields. I note the concern that the growth and yield of stands established in the 1967-1992 era may be overestimated but believe this overestimation is small. I also note that based on the data it is clear the genetic gains are improving and are likely to be higher in the future than the values used in the managed stand yields used in this analysis. After weighing the potential timber supply overestimation from using TASS rather than VDYP against the potential underestimation due to improved seed, I find that on balance, volume estimates for managed stands are reasonable. Consequently, I will make no adjustment to the alternative timber supply projection for this factor.

As indicated under ‘*site productivity estimates*’ and given the reliance of the timber supply projection on managed stand yields, there is uncertainty with how managed stands were modelled in the analysis. I want to reduce this uncertainty for the next TSR as the timber supply in TFL 38 is significantly dependent on the contribution of managed stands. Under ‘**Implementation**’, I ask the licence holder to work with FAIB to establish a young stand monitoring (YSM) program, the

results of which will better quantify the difference in yield between projected managed stand yield tables and actual measured volume.

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

As noted in Table 1, I have considered factors related to operational adjustment factors, silviculture management regime, regeneration delay, and not satisfactorily restocked, and I find them to have been appropriately accounted for in the analysis, with no further comment required.

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

As noted in Table 1, I have considered factors related to juvenile spacing and silviculture systems, and I find them to have been appropriately accounted for in the analysis, with no further comment required.

**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**

*- dead potential volume – 2006 coastal log grade changes*

The analysis for TFL 38 did not account for dead potential volume, as growth and yield projections do not account for the volume of dead trees that could potentially be used as sawlogs. In 2006 the Ministry of Forests released a report titled *Summary of Dead Potential Volume Estimates for Management Units within the Coast Forest Region*. Data sources for the report came from inventory audit plots, VRI Phase II ground samples, permanent sample plots, and temporary sample plots.

Based on 50 plots within the Soo TSA, dead potential volume could account for as much as 4.5 percent of the green volume for the forested land base over 60 years of age within TFL 38. This value represents the maximum amount of dead timber volume that could contribute to harvest but information on what portion is recovered is not easy to discern. This dead volume is also largely found in older mature stands of natural origin where harvest has been limited in the projection to reflect operational practice.

Given the uncertainty regarding the actual utilization it is difficult to arrive at a reliable estimate of the contribution of dead potential volume to harvest. Consequently, I will account for a small unquantified underestimation of the low elevation alternative timber supply projection, as indicated under ‘**Reasons for Decision**’.

**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**

*- landscape-level biodiversity*

In TFL 38, landscape-level biodiversity objectives for old-seral forest types originate from the *Order Establishing Provincial Non-Spatial Old Growth Objectives* (NSOGO). Following the NSOGO Order, the previous TFL 38 licence holder identified draft OGMA that were spatially distributed across the TFL. These OGMA were not legally established, however they have been formally recognized and adopted by the current licence holder to achieve the landscape-level biodiversity objectives through their forest stewardship plan.

For this analysis, all non-legal OGMA totalling a gross area of 5117 hectares were removed from the THLB. Additionally, as the draft OGMA have not been legally established, the full aspatial targets established under the NSOGO were applied in the model reserving additional old growth where non-legal OGMA fell short. I note that the old-seral stage targets from the NSOGO are currently being well met, as the minimum required area for 250-year-old stands is

5813 hectares, while there is currently 25 105 hectares of forest that are older than 250 years old in the TFL. This equates to about 56 percent of the forested area and 37 percent of the THLB being older than 250 years of age within TFL 38.

In 2021, the government convened an independent Old Growth Technical Advisory Panel (TAP) to identify at-risk old growth ecosystems and prioritize areas for temporary deferral from harvesting. The TAP identified 2.6 million hectares of B.C.'s most at-risk old growth forests for deferral, including priority old forest with large trees (1.7 million hectares), ancient forest (400 000 hectares), and rare forest (500 000 hectares). As long-term measures have not yet been identified for old growth, the TAP polygons contributed to the THLB in the alternative timber supply scenario.

Of the approximately 25 105 hectares of old growth on the TFL, approximately 7718 hectares are within the THLB and approximately 5780 hectares are located within the THLB below 1200 metres elevation. Approximately 3289 hectares are identified as priority TAP polygons within the THLB below 1200 metres elevation.

It is my expectation that there will be changes to the way that old forest is managed in the TFL. The implementation of long-term measures for old forest management, including TAP polygons and other old forest, is expected to occur through land use planning processes, in collaboration with First Nations and input from the public. During that transition I expect that some of the old forest contributing to the alternative timber supply projection may be deferred from harvest. There is currently no harvesting occurring within the supported deferral areas within TFL 38, and this determination must reflect this operational reality.

I do not have the authority to make land use decisions regarding the amount of area protected for old forest management in the province. I am concerned that the avoidance of harvesting in older forests may result in overharvesting in younger forests, which could negatively impact the timber supply sustainability of the TFL. My concern is also to ensure there is flexibility for the implementation of appropriate long-term measures for old forest management that reflect the evolving management expectations around old growth. I will implement short-term measures in my decision to ensure that harvest deferrals in old forest, do not unintentionally result in the overharvest of young forests within the remainder of the TFL.

Most of the supported old forest deferrals are located below 1200 metres in elevation and there has been very little historic harvest above 1200 metres in elevation. Within the THLB below 1200 metres in elevation approximately 5780 hectares, or 30 percent, are old forest.

Therefore, below 1200 metres in elevation, I will limit the harvest of stands older than 250 years (age class 9) to 30 percent, understanding that a proportion of this volume will likely be deferred in the short term. Limiting the harvest of old forest below 1200 metres in elevation may unintentionally lead to overharvesting the younger forest. To prevent the unintentional overharvest of young forest that may result from old forest deferrals, I will specify a limit of 70 percent on the harvest of stands 250 years (age classes 1 to 8) and younger below 1200 metres in elevation.

Within the THLB above 1200 metres 1938 hectares, or 92 percent, are old forest as there has been very little historic harvest above 1200 metres in elevation. With such a small amount of young forest, it is not necessary to implement a partition for stands less than 250 years of age.

Currently on TFL 38 there is approximately 2405 hectares of THLB above 1200 metres in elevation and 18 703 hectares of THLB below 1200 metres in elevation.

Under '**Implementation**', I request Ministry staff to work with the licence holder to monitor and assess harvest performance within the partitions and report performance to me annually.

- *visual quality objectives*

Visual quality objectives (VQO) prescribe the extent of forest alteration that can result from the size, shape, and location of cutblocks and roads. The scenic areas and VQOs currently in place in TFL 38 were established in 1995 and have not been updated since that time. Within TFL 38 VQOs are managed on 4041 hectares of the AFLB.

Visually effective green-up (VEG) is the stage at which a regenerating forest is perceived by the public as newly established forest. When VEG is achieved the forest cover generally blocks the view of tree stumps, logging debris, and bare ground. In the analysis, blocks were determined to have met VEG when trees reached five metres in height.

The VQOs modelled in the analysis were Retention, Partial Retention, and Modification. Additionally, a Retention VQO was modelled on 3979 hectares of AFLB within Cultural Management Areas. The disturbance limit (i.e., the area that has not achieved VEG) modelled for each VQO polygon was 3 percent, 10 percent, and 20 percent, respectively. These disturbance limits represent the mid-point of the allowable range for use in timber supply analysis.

The green-up height of five metres that was modelled in the analysis did not consider variation in slope. VQOs should ideally be applied according to the 1998 Timber Supply Review Bulletin entitled *Procedures for Factoring Visual Resources into Timber Supply Analyses* by using a range of green-up heights that take into consideration slope and perspective. I note that the five-metre green-up height that was used in the analysis represents a slope range of 21 to 25 percent in the 1998 Bulletin. The 2023 *Provincial Timber Management Goals, Objectives, and Targets for TFL 38* reports that approximately 81 percent of the land base in TFL 38 is comprised of slopes steeper than 30 percent. This indicates that the five-metre green-up height used in the analysis is not an appropriate representation of VEG for the terrain found within the TFL. I conclude that a coarse approach for modelling VEG was utilized in the analysis and under '**Reasons for Decision**', I will account for a small unquantified overestimation of the low elevation alternative timber supply projection.

**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

- *climate change*

As discussed under '*Guiding principles for AAC determinations*', climate change is a key area of uncertainty for the TFL 38 TSR. Climate change is predicted to impact forest ecosystems in several ways including a general increase in temperatures, change in precipitation patterns, and an increase in the frequency and severity of disturbances including wildfires, floods, landslides, and occurrences of insects and disease. While the trends are generally consistent, the specific magnitude of these changes, their spatial and temporal distribution, and impacts to timber supply are uncertain.

Utilizing the Pacific Climate Impact Consortium meteorology for northwest North America dataset, climate trends were evaluated for TFL 38 between the years 1942 and 2012. The results show that mean annual temperature has increased significantly by 1.1° C, with the greatest warming occurring in the winter (1.6° C), followed by summer (1.2° C). There was no significant increase in extreme maximum or minimum temperatures or mean annual precipitation, however, spring precipitation has significantly increased by 26.2 percent.

Future climate change projections for TFL 38 were analyzed using ClimateBC, v7.21. A comparison of climate model projections for 2041 to 2070 and the baseline period of 1961 to 1990, shows that mean annual temperatures may increase by 3.0°C, with summer increasing the most (3.8°C) and spring the least (2.6°C). Extreme annual maximum temperatures may increase by 3.2°C and extreme annual minimum temperatures by 4.3°C. Seasonal mean maximum temperatures may increase the most in summer (3.4°C) and least in the spring (2.6°C). Seasonal mean minimum temperatures may increase the most in summer (4.2°C) and the least in winter (2.2°C). The model results show only minor increases in annual precipitation. However, fall is projected to be 9.9 percent wetter and summer is projected to be 13.5 percent drier.

Multiple derived climate variables are available in the ClimateBC model and were analysed for change during the same climate modelling period of 2041 to 2070 and the baseline period of 1961 to 1990. Annual precipitation as snow is projected to decrease by 37 percent. Growing degree days and frost-free periods may both increase, however, so will demands for moisture as indicated by an increase in climate moisture deficit of 28.7 mm.

Projected declines in snow and a shortened snow season can increase the risk of frost damage due to a lack of snow cover to protect trees from cold temperatures and soil moisture storage available to trees during the growing season. The model projections also indicate moisture demands from evaporation will increase, given the change particularly in the summer, and increase the risk of impact or mortality to a variety of tree species from drought. Increases in growing degree days and frost-free period may mean some vegetation will see enhanced growth although moisture availability may limit that potential. I note that the potential for stressed trees due to hot and dry conditions in the summer months will also limit natural defenses from other disturbances such as pests and wildfire, of which the climate projections are favourable for these to increase as well.

The climate is changing, I expect that future timber supply throughout TFL 38 will be reduced by some unknown amount. For this determination, as described under '**Reasons for Decision**', I will account for an unquantified long-term overestimation of timber supply in the alternative timber supply projection due to climate change.

Non-recoverable losses (NRL) are timber volumes destroyed or damaged on the THLB by natural causes such as fire, wind, and disease that are not recovered through salvage operations and remain unutilized. These timber volumes do not include endemic losses that are incorporated within growth and yield model projections or epidemic losses specifically modelled.

Average annual NRLs between 1999 and 2019 in the Soo TSA were prorated by the licence holder to determine losses for TFL 38. For the TFL it was determined that insect's affect 2978 cubic metres annually, while fire impacts 1476 cubic metres annually, for a total annual NRL of 4454 cubic metres. In the alternative timber supply projection, an area equivalent to 4454 cubic metres in the THLB was set to age zero each year to account for NRLs.

I note that NRLs were not modelled in the non-THLB as is normally the case. Additionally, future increases in expected NRLs were not included in the alternative timber supply projection. The explicit modelling of natural disturbance instead of the use of NRLs, allows for the modelling of natural disturbance processes that apply equally in the THLB and in the non-THLB. Under '**Implementation**', I request the licence holder to develop ways to integrate the implications of climate change projections such as growth and yield and natural disturbance in timber supply analyses to better inform future decisions. As I have accounted for an unquantified downward pressure due to climate change, I make no further reductions for non-recoverable losses here.



- *cumulative effects*

Mining and forestry have historically been the predominant industries in the South Coast Region. In recent years, liquefied natural gas development, residential development, tourism, agriculture, transportation, and recreational activities have been increasing within the region.

Cumulative effects are changes to social, economic, and environmental conditions caused by the combined impact of past, present, and potential human activities, or natural events. The provincial cumulative effects team has developed a framework, the cumulative effects framework, for assessing cumulative effects on high priority values and implementing cumulative effects assessments across the province.

The Howe Sound Cumulative Effects Project is the primary project in the South Coast Region. The seven initial priority values being assessed in the project include aquatic ecosystems, forest biodiversity, old growth, forest visual quality, Grizzly Bear, Roosevelt Elk, and Marbled Murrelet. However, the Howe Sound Cumulative Effects project area does not overlap with TFL 38 and therefore no additional practices were modelled to address cumulative effects in the low elevation alternative timber supply projection.

I conclude that the low elevation alternative timber supply projection reflects current management, the status of the effects of past and present industrial activity on the land base, and the legal objectives established by government for various non-timber resources. I will not make any adjustment to the low elevation alternative timber supply projection to account for projected cumulative effects to forest values. As further information becomes available it will be incorporated into future AAC determinations.

- *undercut and unused AAC disposition plans*

In January 2018 the Ministry introduced a *Policy Regarding the Administration of Unharvested Volumes, Uncommitted Volumes and Unused BCTS Volumes* (collectively referred to as accumulated volume). The alternative timber supply projection is predicated on the condition of the forest, including the amount of merchantable timber growing stock present, as of the date of the timber supply analysis. The standing forest was not depleted to account for potential harvesting of any accumulated ('undercut') volume in TFL 38. Therefore, any volume harvested (including accumulated volume) that is above the AAC set by this determination, may constitute use of the growing stock at a greater rate than projected in the alternative timber supply scenario.

Regional Tenures staff indicate that as of March 31, 2023, there is an accumulation of approximately 2.7 million cubic metres of unused volume that has accrued in TFL 38 since 2007. In accordance with delegated authority under the *Forest Act* and provincial unused volume policy, the Regional Executive Director (RED) is the statutory decision maker on the disposition of 2.3 million cubic metres of this volume. On July 11, 2023, the RED sent a letter to the licence holder informing them that a decision was made to not proceed with the disposition of any of the 2.3 million cubic metres of unused volume.

As of March 31, 2023, BCTS' unused/uncommitted volume in TFL 38 is 421 009 cubic metres. On September 22, 2023, the BCTS Executive Director sent a letter to the licence holder indicating the retirement of 224 622 cubic metres of unused volume, resulting in a carry forward volume of 196 387 cubic metres in TFL 38.

The standing forest was not depleted to account for potential harvesting of any accumulated volume in TFL 38. It is necessary for me to account for the BCTS carry forward volume of 196 387 cubic metres that may be harvested under a timber sale licence over the term of the AAC determination period. I note that the low elevation alternative timber supply projection began in 2018 and the difference between the low elevation projection volume and the total volume

harvested between 2018 and 2022 is 246 258 cubic metres. This is the timber supply volume available but not represented in the low elevation alternative timber supply projection after the year 2022. The retired accumulated and unharvested volume of 246 258 cubic metres exceeds the BCTS carry forward volume amount of 196 387 cubic metres by 49 871 cubic metres.

Therefore, if the BCTS carry forward volume of 196 387 cubic metres were to be utilized the sustainability of the TFL would not be compromised, due to the surplus of retired accumulated and unharvested volume. The volume difference of 49 871 cubic metres may also indicate that the low elevation alternative timber supply may be underestimated. While there has been a difference between actual harvest levels and the low elevation alternative supply projection, I note that there are many complex factors associated with forest management and sustainability within the TFL that need to be taken into consideration. The harvesting of old forest comprised of hemlock and balsam is often dependent on economic viability. As market cycles are difficult to predict, I do not consider that any adjustments to the low elevation alternative harvest projection is required to account for accumulated volume.

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

*- recommended management strategy*

Northwest Squamish Forestry Limited constructed an alternative timber supply scenario that varied from the base case analysis. In the alternative timber supply scenario, the harvest was partitioned into a low (below 1200 metres) and high (above 1200 metres) elevation harvest projection. The intent of the alternative timber supply projection was to reflect the economics of harvesting on the TFL in lower elevations, while creating a high elevation partition for opportunity timber during periods of high lumber prices, as little harvest has historically occurred above 1200 metres in elevation.

The alternative timber supply projection limited the harvest of low elevation stands older than 100 years old to 62 000 cubic metres per year for 50 years. The objective for the low elevation projection was a non-declining even-flow. For low elevation stands, a harvest level of 110 950 cubic metres per year was maintained throughout the projection.

In the high elevation projection, there was no attempt to limit the decadal increases or decreases in the harvest level to 10 percent or any other value. For high elevation stands a harvest level of 38 864 cubic metres per year can be maintained for 20 years. The harvest projection declines at year 21 to 23 331 cubic metres per year and again at year 31 to 9365 cubic metres per year. The mid-term harvest level of 2014 cubic metres per year is reached at year 41 and the long-term harvest level of 5425 cubic metres per year is reached at year 136.

The alternative harvest projection can maintain an additive harvest projection of 149 816 cubic metres per year for the first 20 years by adding the low elevation (110 950 cubic metres) and high elevation (38 864 cubic metres) stand contributions together.

As discussed under ‘*Base case for TFL 38*’, I believe that the licence holder’s alternative harvest projection best reflects current harvesting practices within the TFL. However, while I recognize the licence holder’s intentions of creating a high elevation harvest opportunity during periods of high lumber prices, I do not accept the method in which the high elevation harvest projection was determined. The high elevation harvest projection did not limit the decadal decreases in the harvest level, depleting the growing stock at an unacceptable rate, therefore the projection did not demonstrate a sustainable harvest level over the 250-year planning projection.

As the high elevation stands were depleted at an unacceptable rate in the projection, I must now approximate what a sustainable contribution from high elevation stands would be. I note that

approximately 11.4 percent of the THLB is located above 1200 metres in elevation. If the high elevation THLB were to contribute proportionally to the short-term base case harvest projection of 119 430 cubic metres per year, high elevation stands would contribute about 13 615 cubic metres per year to the short-term harvest level. As little timber harvesting has occurred within high elevation stands, about 81 percent of the high elevation THLB is older than 250 years of age and these older stands contain higher volume per hectare, representing approximately 17 percent of the total initial growing stock. Given that the high elevation stands represent opportunity timber during periods of high lumber prices and contain higher volumes, I will account for a slight increase in their contribution to the AAC, compared with their THLB proportion. As discussed under ‘**Reasons for Decision**’, I will add a sustainable contribution level of 15 000 cubic metres per year from stands located above 1200 metres in elevation to my AAC determination.

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

*- 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 Interests that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations. The AAC determination is a strategic decision that 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.

The AAC can affect various resource values and therefore the ability of Aboriginal Peoples to meaningfully exercise their Aboriginal rights. Information gained through consultation with potentially affected First Nations about Aboriginal Interests has been considered in the development of this determination.

TFL 38 overlaps with the territories of the Squamish Nation (Skwxwú7mesh Úxwumixw), Lil’wat Nation, and Tsleil-Waututh Nation. Additional First Nations with periphery territory overlap with TFL 38 include the Klahoose First Nation and the St’at’imc Chiefs Council.

The licensee shared an *Information Package, Management Plan, and Analysis Report* with potentially impacted First Nations on November 3, 2022. In a parallel process, Ministry staff led the consultation process for the various TSR phases, consistent with the signed agreements held by the affected First Nations and the *Updated Procedures for Meeting Legal Obligations When Consulting First Nations and Haida Principles*.

The licence holder and the Squamish Nation met to discuss *Management Plan No. 10*. Comments were not received from the Tsleil-Waututh Nation. The Lil’wat Nation responded that they reviewed the information provided for the *TFL 38 Management Plan No. 10* and had no concerns. They stated that if any new information were to arise that indicates there may be impacts on Lil’wat aboriginal rights, title, or interests, they would expect to receive notice and to have an opportunity to provide comments at that time. I note that any potentially adverse impacts on the Aboriginal Interests of the relevant First Nations stemming from forest development activities that occur after the AAC determination can be appropriately mitigated through existing legislation and regulation, planning documents, and meaningful engagement at the operational level.

In reviewing the First Nations consultation process with Ministry staff, I conclude the First Nations whose territories overlap TFL 38 were consulted in accordance with current

provincial guidance, applicable case law, and the signed agreements held by the affected First Nations. I am satisfied that these consultations have been carried out in good faith and the Crown's process of seeking to understand potentially outstanding issues and impacts was reasonable.

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

As noted in Table 1, I have considered a factor related to abnormal infestation and devastation, and I find it to have been appropriately accounted for in the analysis, with no further comment required.

**Reasons for Decision**

In reaching my AAC determination for TFL 38, I have considered all the factors required under Section 8 of the *Forest Act* and I have reasoned as follows.

In the alternative timber supply scenario, in low elevation stands, a harvest level of 110 950 cubic metres per year was maintained throughout the projection. In the high elevation projection, there was no attempt to limit the decadal increases or decreases in the harvest level to 10 percent or any other value. For high elevation stands, a harvest level of 38 864 cubic metres per year can be maintained for 20 years. The harvest projection declines at year 21 to 23 331 cubic metres per year and again at year 31 to 9365 cubic metres per year. The mid-term harvest level of 2014 cubic metres per year is reached at year 41 and the long-term harvest level of 5425 cubic metres per year is reached at year 136.

I am satisfied that the assumptions applied in the alternative timber supply projection, for most of the factors applicable to TFL 38, were appropriate including those detailed in Table 1 or as previously discussed in this rationale. However, I have identified some factors, which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Some of these factors can be readily quantified and their impact on harvest projections assessed with reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision but cannot be reliably quantified at this time.

As most of the timber harvesting in TFL 38 occurs below 1200 metres in elevation, I will consider the overestimates and underestimates in relation to the low elevation alternative timber supply projection of 110 950 cubic metres per year. I have identified the following factors in my considerations as indicating that the timber supply projected in the low elevation alternative timber supply projection may have been overestimated, to a degree that can be quantified:

- *Stand-level biodiversity*: The actual levels of wildlife tree retention exceed the legal FPPR minimums that were modelled in the alternative timber supply projection. When wildlife tree retention levels are based on licensee practices, the low elevation alternative timber supply is overestimated by 4.6 percent.

I have identified the following factors in my considerations as indicating that the timber supply projected in the low elevation alternative timber supply projection may have been overestimated, but are not quantifiable at this time:

- *Wildlife habitat area – Marbled Murrelet*: The legal requirement for Marbled Murrelet habitat protection has been defined but has not yet been spatialized. The analysis did not account for the 2021 FPPR Section 7 Notice, resulting in an unquantified overestimation of the low elevation alternative timber supply projection.

- *Terrain stability*: Current harvest performance information in potentially unstable class IV terrain was not provided by the licence holder. The THLB reduction to account for harvest performance in potentially unstable slopes for TFL 38 is lower compared with other similar coastal management units, which may result in an unquantified overestimation of the low elevation alternative timber supply projection.
- *Visual quality objectives*: VQOs should be applied according to the 1998 Timber Supply Review Bulletin entitled *Procedures for Factoring Visual Resources into Timber Supply Analyses* by using a range of green-up heights. The green-up height modelled in the analysis did not consider variation in slope, resulting in a small unquantified overestimation of the low elevation alternative timber supply projection.
- *Climate change*: There is substantial scientific agreement that the climate is changing, and the changes will affect forest ecosystems. The magnitude of the impact is difficult to quantify but climate change will result in a long-term unquantified overestimation of the alternative timber supply projection.

I have identified the following factor in my considerations as indicating that the timber supply projected in the low elevation alternative timber supply projection may have been underestimated, but are not quantifiable at this time:

- *Dead potential volume*: Growth and yield projections do not account for the volume of dead trees that could potentially be used as sawlogs. Therefore, the volume from dead trees that could potentially be used as sawlogs was not accounted for, resulting in the low elevation alternative timber supply projection underestimating the short-term timber supply by a small unquantified amount.

In considering the above-mentioned influences, I find that the combined effect of accounting for the quantifiable factors represents a net overestimation of the low elevation timber supply projection by about 4.6 percent. In addition, there were some factors mentioned above (Wildlife Habitat Area – Marbled Murrelet; Terrain Stability; Visual Quality Objectives; and Climate Change) where I considered the impacts to timber supply were overestimated but unquantified. There was one factor (Dead Potential Volume) where I considered timber supply to be underestimated but unquantified. These unquantified factors add some uncertainty to the low elevation alternative timber supply projection.

It is my expectation that there will be changes to the way that old forest is managed in the TFL. Implementation of long-term measures for old forest management, including TAP polygons and other old forest, is expected to occur through land use planning processes, in collaboration with First Nations and input from the public. While this unfolds, I anticipate that some of the old forest contributing to the alternative timber supply projection may be deferred from harvest. There is currently no harvesting occurring within the supported deferral areas within TFL 38, and this determination must reflect this operational reality.

When making AAC determinations, I can specify portions of the harvest attributable to different timber types, geographic areas, or types of terrain. This is referred to as an AAC partition. The purpose of a partition is to ensure that the harvest attributable to certain types of timber, terrain, or geographic areas of the TFL is not taken from another (potentially higher value) area or type of forest. A partition may also be applied to encourage use of the timber from different areas and timber types that may not be otherwise harvested.

As discussed under ‘*Landscape-level biodiversity*’, most of the old forest deferrals are located below 1200 metres in elevation and there has been very little historic harvest above 1200 metres in elevation. Therefore, below 1200 metres in elevation, I will limit the harvest of stands older

than 250 years (age class 9) to 30 percent, understanding that a proportion of this volume will likely be deferred in the short term. Limiting the harvest of old forest below 1200 metres in elevation may unintentionally lead to overharvesting the younger forest. To prevent the unintentional overharvest of young forest that may result from old forest deferrals, I will specify a limit of 70 percent on the harvest of stands 250 years (age classes 1 to 8) and younger below 1200 metres in elevation.

The March 28, 2007, AAC determination specified a partition of 79 500 cubic metres per year attributable to the Wild Spirit Places (WSPs) pending resolution of their status under the Sea-to-Sky LRMP. This partition is no longer required, as the WSPs are fully accounted for in the licence holder's new analysis.

As discussed under '*Recommended management strategy*', there has been very little historic harvest above 1200 metres in elevation. While the high elevation harvest projection displayed that it is possible to harvest 38 864 cubic metres per year for 20 years, I have concluded that 15 000 cubic metres per year is a sustainable contribution to the AAC from high elevation stands.

The factors where the impact to timber supply were quantifiable indicate the low elevation alternative timber supply projection of 110 950 cubic metres per year should be decreased by 4.6 percent. After considering the factors discussed above indicating that the low elevation alternative timber supply projection was overestimated but unquantified, I decided that low elevation stands will contribute 102 500 cubic metres per year to the timber supply. With the addition of 15 000 cubic metres per year from the high elevation stands, the new AAC for TFL 38 will be 117 500 cubic metres per year. A maximum of 102 500 cubic metres per year may be harvested below 1200 metres in elevation. Below 1200 metres in elevation, a maximum of 30 750 cubic metres per year (30 percent) may be harvested from stands older than 250 years and a maximum of 71 750 cubic metres per year (70 percent) may be harvested from stands 250 years and younger.

## **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, reflects current management practices, as well as the socio-economic objectives of the Crown, can be best achieved in TFL 38 by establishing an AAC of 117 500 cubic metres per year. In making this determination, I specify, under Section 8(5)(a) of the *Forest Act*, three partitions:

1. Below 1200 metres elevation: A maximum of 102 500 cubic metres per year may be harvested below 1200 metres in elevation.
2. Old Stands: Below 1200 metres in elevation, a maximum of 30 750 cubic metres per year (30 percent) may be harvested from stands older than 250 years.
3. Not Old Stands: Below 1200 metres in elevation, a maximum of 71 750 cubic metres per year (70 percent) may be harvested from stands 250 years and younger.

This new AAC is about 53 percent lower than the AAC in place prior to this determination of 250 500 cubic metres per year and 39 percent greater than the average annual harvest level since the last AAC determination in 2007.

This determination becomes effective on August 29, 2024, and will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination.

## Implementation

In the period following this decision and leading to the subsequent determination, I expect Ministry staff and licence holder staff to undertake or support the tasks and studies noted below, the particular benefits of which are described in appropriate sections of this rationale document.

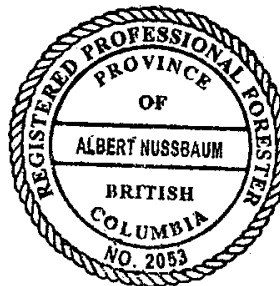
I recognize that the ability of all parties to undertake or support these projects is dependent on provincial priorities and available resources, including funding. However, these projects are important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in TFL 38.

1. I request Ministry staff to work with the licence holder to monitor and assess harvest performance within the partitions, and report to me annually.
2. I ask the licence holder to monitor harvest performance in the helicopter operability category.
3. I request the licence holder to monitor the amount of timber harvesting that occurs within the Nexw Áyantsut (Sims Creek) and Estétiwilh (West Squamish) Cultural Management Areas.
4. I expect the licence holder to complete a new forest inventory of the TFL or audit the existing forest inventory to validate its quality.
5. I expect the licence holder to work with FAIB to establish a YSM program, the results of which will better quantify the difference in yield between projected managed stand yield tables and actual measured volume.
6. I request the licence holder to develop ways to integrate the implications of climate change projections such as growth and yield and natural disturbance in timber supply analyses to better inform future decisions.



Albert Nussbaum, RPF  
Deputy Chief Forester

August 29, 2024



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

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to July 14, 2024), reads as follows:

### Allowable annual cut

- 8** (1) The chief forester must determine an allowable annual cut at least once every 10 years after the date of the last determination, for
- (a) the Crown land in each timber supply area, excluding the Crown land in the licence areas of area-based licences, and
  - (b) each tree farm licence area.

(2) If the minister

- (a) makes an order under section 7 (b) respecting a timber supply area, or
- (b) amends or enters into a tree farm licence to accomplish a result set out under section 39 (2) or (3),

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

- (c) within 10 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and
- (d) after the determination under paragraph (c), at least once every 10 years after the date of the last determination.

(3) If

- (a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and
- (b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

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

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

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



- (b) must give written reasons for the postponement.
- (3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she
- (a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and
  - (b) must give written reasons for setting the earlier date.
- (4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).
- (5) In respect of an allowable annual cut determined under this Act, the chief forester may, at any time, specify that portions of the allowable annual cut are attributable to one or more of the following:
- (a) different types of timber or terrain in different parts of Crown land within a timber supply area or tree farm licence area;
    - (a.1) different areas of Crown land within a timber supply area or tree farm licence area;
    - (b) different types of timber or terrain in different parts of private land within a tree farm licence area.
  - (c) [Repealed 1999-10-1.]
- (5.1) The chief forester may, at any time, amend or cancel a specification made under subsection (5).
- (6) The minister must determine an allowable annual cut for each woodlot licence area in accordance with the woodlot licence for that area.
- (7) The minister must determine an allowable annual cut for
- (a) each community forest agreement area in accordance with the community forest agreement for that area, and
  - (b) each first nations woodland licence area in accordance with the first nations woodland licence for that area.
- (8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

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

- (i) the composition of the forest and its expected rate of growth on the area,
- (ii) the expected time that it will take the forest to become re-established on the area following denudation,
- (iii) silviculture treatments to be applied to the area,
- (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,
- (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and
- (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

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

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

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

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

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

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

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

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

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

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

Section 4 of the *Ministry of Forests and Range Act* (current to August 20, 2024) 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 November 24, 2021



Reference: 268022

November 24, 2021

Diane Nicholls, R.P.F.  
Assistant Deputy Minister and Chief Forester

Dear Diane Nicholls:

The *Forest Act* gives you the authority to determine an allowable annual cut (AAC) for each timber supply area and tree farm licence in the province and specifies what you must consider when determining an AAC. Included in these considerations are the economic and social objectives of the government, which are provided below. These government objectives are to be considered as part of the comprehensive timber supply review process that your office has developed and implemented to ensure that your AAC determinations consider many forest management objectives and aligns with provincial statutes and regulations. They replace the objectives provided to you by the former minister, Doug Donaldson, on October 30, 2017.

British Columbians expect a government focused on building a strong sustainable economy that works for everyone, providing a path for lasting and meaningful reconciliation with Indigenous peoples, and developing strategies to address climate change. Government has committed to delivering on these priorities while recognizing that healthy, resilient forests are essential to the social, economic, and environmental interests of current and future generations. To advance these commitments, natural resource ministries, Indigenous partners, and stakeholders are collaborating to develop and implement forest management strategies and policies that will be relevant to your AAC determinations. I ask that you remain mindful of these commitments and as government approves related objectives, that you ensure they are fully considered within the timber supply review process.

The British Columbia (BC) government has committed to full and lasting reconciliation with Indigenous Peoples. As the provincial government implements the *Declaration on the Rights of Indigenous Peoples Act* and works toward aligning provincial laws with the United Nations Declaration on the Rights of Indigenous Peoples, I ask that your AAC determinations fully consider relevant outcomes of that work. For greater certainty, please continue to ensure that your AAC determinations are consistent with relevant agreements that are in effect between First Nations and the BC government, and court decisions that define Aboriginal title and rights. I expect you to continue to find ways to advance engagement and collaboration with Indigenous Peoples throughout the timber supply review process. In making your AAC determinations, I also ask that you continue to carefully consider Indigenous knowledge and other input that could have implications for your AAC determinations from First Nations and organizations whose traditional territories overlap the management unit under consideration.

Page 1 of 2

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

Office of the Minister

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

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

Diane Nicholls, Assistant Deputy Minister and Chief Forester

BC's forests provide fibre for forest products, habitat for plants, fish and wildlife, and many other benefits essential to diverse and resilient communities. The capacity of these forests to support economic and environmental sustainability and reconciliation with Indigenous peoples is challenged by insect infestations, increasing levels of wildfire activity and other risks related to climate change. As healthy forests are essential for a healthy industry and province, I ask you consider how your determinations may encourage economic recovery and forest revitalization, improve forest health, and support approved strategies to reduce wildfire.

Since a sustainable and resilient timber supply supports BC's goals for a better, cleaner future and environmental sustainability, your AAC determinations should continue to incorporate, as appropriate, the best available information on climate change and forest health. When making your AAC determinations, please consider ways to encourage management practices that reduce greenhouse gas emissions and support forest resiliency. Practices that are consistent with established climate change strategies, adaptation, and mitigation practices, including practices that result in better fibre utilization and sector diversity, should be explored.

As new land use policies are developed and implemented to support BC's goals for economic activity, environmental sustainability, and reconciliation with Indigenous peoples, I ask that your determinations continue to incorporate, as appropriate, the best available information on the cumulative effects of multiple activities on the land base. Where the cumulative effects of timber harvesting and other land-based activities indicate a risk to natural resource values, your determinations should identify those risks for consideration in land-use planning. I also ask that you consider ways in which your AAC determinations could encourage actions or practices to mitigate the identified risks to natural resource values.

Forests are essential to build a strong, sustainable economy that supports people, communities and competitiveness and this government is focused on transitioning the forestry sector from high volume to high value production. As part of the timber supply review process, I ask that you consider ways to foster and encourage the value-added sector and increase the use of fibre. Please identify timber types that may not be reflected in harvest choice, and in your AAC determinations, examine opportunities for these timber types to sustain clean-energy jobs and value-added products or enhance ecosystem health and resiliency.

In making your AAC determinations, I ask that you consider the needs of local communities as expressed by the public during timber supply review process. This includes input that contribute to the economic recovery and sustainability of communities and is consistent with the government's broader objectives. To ensure a sustainable future for BC's forest-dependent communities, I also ask that when faced with necessary reductions in AAC's that wherever possible those reductions be no larger than necessary to avoid significant longer-term impacts.

Thank you, Diane, for your service and your care and attention to these important matters.

Sincerely,



Katrine Conroy  
Minister

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

The information sources considered in determining the AAC for TFL 38 include the following:

- A New Future for Old Forests: A Strategic Review of How British Columbia Manages for Old Forests within its Ancient Ecosystems. See <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/strategic-review-20200430.pdf>. (Accessed August 14, 2024);
- Aerial Overview Surveys. Ministry of Forests, Lands, Natural Resource Operations and Rural Development. See <https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/forest-health/aerial-overview-surveys> (Accessed August 14, 2024);
- Agreement on Land Use Planning Between the Squamish Nation and the Province of British Columbia as represented by the Minister of Agriculture and Lands, June 14, 2007. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/agreements/seatosky\\_lrmp\\_squamish\\_agreement\\_26jul2007.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/agreements/seatosky_lrmp_squamish_agreement_26jul2007.pdf) (Accessed August 14, 2024);
- Amendment to the Sea-to-Sky Land and Resource Management Plan to Include Non-Commercial Winter Recreation Zones. Integrated Land Management Bureau, Ministry of Agriculture and Lands. March 12, 2009. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/plan/seatosky\\_lrmp\\_plan\\_amendment\\_12mar2009.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/plan/seatosky_lrmp_plan_amendment_12mar2009.pdf) (Accessed August 14, 2024);
- Approved Government Actions Regulation – Ungulate Winter Ranges for U-2-002, U-2-007, U-2-008, U-2-010. See [http://www.env.gov.bc.ca/wld/frpa/uwr/approved\\_uwr.html](http://www.env.gov.bc.ca/wld/frpa/uwr/approved_uwr.html) (Accessed August 14, 2024);
- Approved Legal Orders. Ministry of Forests, Lands, Natural Resource Operations and Rural Development. See <https://www2.gov.bc.ca/gov/content/industry/crown-land-water/land-use-planning/regions> (Accessed August 14, 2024);
- Approved Wildlife Habitat Area Order's for Grizzly Bear, Marbled Murrelet, and Spotted Owl. [https://www.env.gov.bc.ca/cgi-bin/apps/faw/wharesult.cgi?search=wlap\\_region&wlap=Lower%20Mainland](https://www.env.gov.bc.ca/cgi-bin/apps/faw/wharesult.cgi?search=wlap_region&wlap=Lower%20Mainland) (Accessed August 14, 2024);
- Archaeology in British Columbia. Ministry of Forests, Lands, Natural Resource Operations and Rural Development. See <https://www2.gov.bc.ca/gov/content/industry/natural-resource-use/archaeology> (Accessed August 14, 2024);
- Associated Environmental Consultants Inc. 2020. Generating climate trends to support Annual Allowable Cut determinations for Timber Supply Areas and Tree Farm Licences. Report for the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development. March 2020;

- Associated Environmental Consultants Inc. 2022. Summary of updated climate change anomalies for TSA and TFL boundaries across BC. Report for the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development. March 10, 2022;
- British Columbia Geographic Warehouse, <https://www2.gov.bc.ca/gov/content/data/geographic-data-services>;
- BC Ministry of Forests, Lands and Natural Resource Operations and Rural Development. 2018. Policy Regarding the Administration of Unharvested Volumes, Uncommitted Volumes and Unused BCTS Volumes. [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/timber-tenures/timber-tenure-bulletins-policies-procedure/policy\\_regarding\\_the\\_administration\\_of\\_unharvested\\_volumes\\_uncommitted\\_volumes\\_and\\_unused\\_bcts\\_volumes.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/timber-tenures/timber-tenure-bulletins-policies-procedure/policy_regarding_the_administration_of_unharvested_volumes_uncommitted_volumes_and_unused_bcts_volumes.pdf) (Accessed August 14, 2024);
- BC Ministry of Forests, 2023, Provincial Timber Management Goals, Objectives, & Targets – Management Unit Targets – TFL 38 Squamish;
- *Declaration on the Rights of Indigenous Peoples Act*. See <https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/19044> (Current to August 6, 2024);
- Electronic Commerce Appraisal System (ECAS). Ministry of Forests, Lands and Natural Resource Operations, <https://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/electronic-commerce-appraisal-system>;
- Foord, V. 2023. TFL 38 Climate Change Trends;
- Forest Ecosystem Solutions Ltd., 2023, Information Package and Analysis Report for Tree Farm Licence 38, Northwest Squamish Forestry Ltd.;
- Government of British Columbia, 1995. Biodiversity Guidebook;
- Government of British Columbia, 1995. Riparian Management Area Guidebook;
- Government of British Columbia, 1995. Watershed Assessment Procedure Guidebook;
- Government of British Columbia, 2008. Sea-to-Sky Land and Resource Management Plan. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/plan/seatosky\\_lrmp\\_plan\\_apr2008.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/plan/seatosky_lrmp_plan_apr2008.pdf). (Accessed August 14, 2024);
- Harvest Billing System (HBS). Ministry of Forests, <https://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/harvest-billing-system>;
- Northwest Squamish Forestry Ltd., 2023, Tree Farm Licence 38 Management Plan No. 10;
- Letter from the Minister of Forests, Lands, Natural Resource Operations and Rural Development to the chief forester stating the economic and social objectives of the Crown, BC Government, November 24, 2021;
- Provincial Logging Residue and Waste Measurements Procedure Manual, 2019, <https://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/forest-residue-waste/provincial-logging-residue-and-waste-measurements-procedure-manual> (Accessed August 14, 2024);



- Province of British Columbia. 2003. *Forestry Revitalization Act*. Victoria, BC. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/03017\\_01](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/03017_01) Current to August 6, 2024;
- Province of British Columbia. 2004. Cut Control Regulation. Victoria, BC. [http://www.bclaws.ca/Recon/document/ID/freeside/17\\_578\\_2004](http://www.bclaws.ca/Recon/document/ID/freeside/17_578_2004). Current to March 26, 2024;
- *Forest Act*. See [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96157\\_00](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96157_00) (Current to July 14, 2024);
- *Forest and Range Practices Act*. See [https://www.bclaws.ca/civix/document/id/complete/statreg/02069\\_01](https://www.bclaws.ca/civix/document/id/complete/statreg/02069_01) (Current to July 14, 2024);
- Forest Planning and Practices Regulation. See [http://www.bclaws.ca/civix/document/id/complete/statreg/14\\_2004](http://www.bclaws.ca/civix/document/id/complete/statreg/14_2004) (Current to July 9, 2024);
- Province of British Columbia. 2004. Government Actions Regulation. Victoria, BC. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/582\\_2004](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/582_2004). Current to August 6, 2024;
- Province of British Columbia. RSBC 1996. *Heritage Conservation Act*. Victoria, BC. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96187\\_01](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96187_01). Current to August 6, 2024;
- Province of British Columbia. RSBC 1996. *Land Act*. Victoria, BC. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96245\\_01](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96245_01). Current to August 6, 2024;
- Province of British Columbia. RSBC 1996. *Ministry of Forests and Range Act*. Section 4 – Purposes and functions of Ministry. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96300\\_01#section4](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96300_01#section4). Current to August 6, 2024;
- Province of British Columbia. 2010. Updated Procedures for Meeting Legal Obligations when Consulting First Nations. [https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations/legal\\_obligations\\_when\\_consulting\\_with\\_first\\_nations.pdf](https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations/legal_obligations_when_consulting_with_first_nations.pdf). (Accessed August 14, 2024);
- Ministerial order establishing objectives for the Sea to Sky LRMP Area. Ministry of Forests, Lands and Natural Resource Operations. April 14, 2011. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/legal/seatosky\\_lrmp\\_luor\\_14apr2011.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/legal/seatosky_lrmp_luor_14apr2011.pdf). (Accessed August 14, 2024);

- Ministerial Order. Adding the Definitions of Forested Area and Amending the Objectives for First Nations Cultural Places. Land Use Objectives for the Sea-to-Sky Land and Resource Management Plan, Ministry of Forests, Lands and Natural Resource Operations. August 13, 2013. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/legal/seatosky\\_lrmp\\_luor\\_15aug2013amend.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/southcoast-region/seatosky-lrmp/legal/seatosky_lrmp_luor_15aug2013amend.pdf). (Accessed August 14, 2024);
- Ministry of Forests, Lands and Natural Resource Operations, 2008. Soo Timber Supply Area Timber Supply Review, Data Package. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/soo\\_tsa\\_data\\_package.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/soo_tsa_data_package.pdf). (Accessed August 14, 2024);
- Ministry of Forests, 2004. Order Establishing Provincial Non-Spatial Old Growth Objectives. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/policies-guides/old\\_growth\\_order\\_may18th\\_final.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/policies-guides/old_growth_order_may18th_final.pdf). (Accessed August 14, 2024);
- Ministry of Forests. 2003. Modelling Options for Disturbance Outside the THLB - Working Paper. Timber Supply Branch, Ministry of Forests, June 2003;
- Ministry of Forests, 1998. Procedures for Factoring Visual Resources into Timber Supply Analyses. See [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/visual-resource-mgmt/vrm\\_procedures\\_for\\_factoring\\_timber\\_supply\\_analyses.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/visual-resource-mgmt/vrm_procedures_for_factoring_timber_supply_analyses.pdf). (Accessed August 14, 2024);
- Sea-to-Sky Wildland Area Order. Order of Lieutenant Governor in Council. Province of British Columbia. March 24, 2011. See [https://www.bclaws.gov.bc.ca/civix/document/id/oic/arc\\_oic/0109\\_2011](https://www.bclaws.gov.bc.ca/civix/document/id/oic/arc_oic/0109_2011). (Accessed August 14, 2024);
- Timberline Forest Inventory Consultants Ltd., 2002. Timber Supply Analysis Information Package for Tree Farm Licence 38, International Forest Products Ltd., Management Plan #9;
- Tree Farm Licence 38, 2007, Rationale for Allowable Annual Cut Determination, <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/forest-analysis-inventory/tsr-annual-allowable-cut/tree-farm-license/38tf07ra.pdf>. (Accessed August 14, 2024);
- Tsilhqot'in Nation v. British Columbia, 2014 SCC 44, [2014] 2 S.C.R.;
- United Nations. 2007. United Nations Declaration on the Rights of Indigenous Peoples. <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html> (Accessed August 14, 2024);
- Wang, T., Hamann, A., Spittlehouse, D., and C. Carroll. 2016. Locally downscaled and spatially customizable climate data for historical and future periods for North America. PLoS ONE 11(6): e0156720. doi: 10.1371/journal.pone.0156720;

- Werner, A.T., Schnorbus, M.A., Shrestha, R.R., Cannon, A.J., Zweirs, F.W., Dayon, G., and F. Anslow. 2019. A long-term, temporarily consistent, gridded daily meteorological dataset for northwestern North America. *Scientific Data* 6: 180299. doi 10.1038/sdata.2018.299.