

**BRITISH COLUMBIA
MINISTRY OF FORESTS AND RANGE**

**Tree Farm Licence 38
Northwest Squamish Forestry Limited
Partnership**

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

Effective March 28, 2007

**Henry Benskin, R.P.F.
Deputy Chief Forester**

Table of Contents

Objective of this Document.....	1
Description of Tree Farm Licence 38.....	1
History of the AAC	1
New AAC determination.....	3
Information sources used in the AAC determination	3
Role and limitations of the technical information used	6
Statutory framework.....	6
Guiding principles for AAC determinations	6
The role of the base case	9
Timber supply analysis.....	10
Consideration of Factors as Required by Section 8 of the <i>Forest Act</i>	12
Land base contributing to timber harvest.....	12
- General comments	12
- Land base exclusions	13
- Economic and physical operability.....	15
- Harvest profile	15
- Deciduous species	16
Existing forest inventory.....	17
- General comments	17
- Aggregation procedures.....	18
- Volume estimates for existing natural stands	18
- Coastal log grades.....	19
Expected rate of growth.....	20
- Site productivity estimates.....	20
- Volume estimates for regenerated managed stands	21
- Operational adjustment factors.....	22
- Minimum harvestable ages	22
- Gains from the use of select seed	23
Regeneration delay	24
Not-satisfactorily-restocked areas.....	24
Incremental silviculture	25
Utilization standards	25
Decay, waste and breakage.....	25
Integrated resource management objectives	25
- Forest cover adjacency requirements.....	26
- Visually sensitive areas	26
- Riparian management areas.....	26
- Wildlife habitat.....	27
- Identified wildlife	27
- Grizzly Bear Wildlife Management Zone	28
- Bald Eagle Wildlife Management Zone	28
- Moose Winter Range Wildlife Management Zone.....	29
- Mountain Goat Wildlife Management Zone.....	29
- Deer habitat	30
- Spotted Owl.....	31
- Marbled Murrelet.....	32
- Summary of Wildlife Habitat Areas	32
- Recreation Management Zone	32
- Landscape-level biodiversity	33
- Old-Growth Management Areas (OGMAs).....	33

- Stand-level biodiversity: wildlife tree patch retention.....35

- Summary of biodiversity considerations35

- Cultural heritage values36

Other information37

- First Nations Consultation37

- Wild Spirit Places – harvest level partition37

- Twenty-year plan39

- Management Plan No. 940

- Outstanding planning issues40

- Harvest sequencing.....40

- Actual harvest level41

Alternative Harvest Flows41

- Community dependence on forest industry42

Minister’s letter.....43

Local objectives44

Reasons for Decision44

Determination47

Implementation.....48

Appendix 1: Section 8 of the *Forest Act*50

Appendix 2: Section 4 of the *Ministry of Forests and Range Act*52

Appendix 3: Minister’s letter of July 4, 2006.....52

Objective of this Document

This document is intended to provide 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.

Description of Tree Farm Licence 38

Tree Farm Licence 38 is held by the Northwest Squamish Forestry Limited Partnership. The TFL was assigned to the Partnership in December, 2005, following transfer by sale from the previous licensee, International Forest Products Limited. TFL 38 is located on the mainland coast adjacent to the Soo Timber Supply Area (TSA), and is administered for the Forest Service from the Squamish Forest District Office in Squamish, BC. The TFL, which includes the watersheds of the Ashlu and Elaho Rivers as well as the mid and upper reaches of the Squamish River system, includes components of the Coastal Western Hemlock, Mountain Hemlock, and Alpine Tundra biogeoclimatic zones. The TFL covers a total area of 189 287 hectares, 71 percent of which are non-forested, steep, mountainous terrain and ice fields. The majority of the forest available for harvesting in the TFL comprises mature stands of western hemlock, balsam, western red cedar and Douglas-fir.

Within the TFL, 54 357 hectares are productive forest. Of this area, 32 349 hectares or 59.5 percent are considered as part of the current timber harvesting land base, with the balance of the productive area either classified as inoperable or reserved for the management or protection of resources other than timber.

Communities situated near the TFL include Squamish, Whistler, Lions Bay and Pemberton, all of which are located within the Squamish-Lillooet Regional District (SLRD), the population of which the SLRD Regional Growth Strategy estimated in 2005 at approximately 35 000 (for 2003). Squamish is the largest community in the SLRD.

The Squamish (Skwxwumish7ulh) and Lil'Wat First Nations have asserted traditional territories within TFL 38.

Seven species of identified wildlife (i.e. species requiring special management) are considered likely to occur within TFL 38 — Mountain Goat, Grizzly Bear, Rubber Boa, Tailed Frog, Bull Trout, Marbled Murrelet, and Northern Goshawk.

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, which 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, at which time a new 25-year agreement for TFL 38 was issued to Weldwood. TFL 38 was transferred on February 27,

1995, to International Forest Products Limited (Interfor) and transferred from Interfor to the current owner on December 22, 2005.

The AAC for Management Plan (MP) No. 1 when TFL 38 was first issued to Empire Mills Limited in 1961, was 117 516 cubic metres.

In 1969 the AAC was determined at 263 348 cubic metres and remained at that level through successive determinations until 1986 when it was adjusted slightly to 263 000 cubic metres. This level was maintained through further AAC determinations until 1998.

In 1988 and 1989 a total of five percent of the AAC attributable to Crown land on TFL 38, amounting to 13 118 cubic metres, was allocated to the Small Business Forest Enterprise Program (SBFEP), reducing the AAC available to the licensee (including the AAC attributable to private lands) to 249 882 cubic metres. In 1995, the AAC available to the licensee was further reduced by five percent, or 12 463 cubic metres, as a result of the transfer of the TFL from Weldwood to Interfor.

In August 1998, the AAC for the TFL was reduced by 12 500 cubic metres to 250 500 cubic metres as a result of the deletion from the TFL of the area covered by the Elaho/Sims/Clendenning portion of the Lower Mainland Protected Areas Strategy. This AAC reduction was attributed to the volume available to the SBFEP, now British Columbia Timber Sales (BCTS), leaving the AAC available to the licensee unchanged at 237 382 cubic metres and the volume available to BCTS at 13 118 cubic metres.

(It should be noted that while the 5 percent 'take-back' volume of 12 463 cubic metres from the 1995 transfer of the TFL was intended to be apportioned to BCTS, when the Clendenning Park was created a decision was made to charge the volume impacts of the Park to the 5-percent 'take-back' volumes; hence the volume of 13 118 cubic metres available for BCTS remains the same.

In December, 2004, in two Minister's orders under the *Forestry Revitalization Act*, the Minister reduced the AAC available to the licensee by 98 823 cubic metres and a further 29 106 cubic metres, leaving the AAC available to the licensee at 109 473 cubic metres. In June 2006, the Minister and the Squamish First Nation signed the Squamish First Nation Interim Agreement on Forest and Range Opportunities which includes a provision inviting the Squamish Nation to apply for non-replaceable licences to a maximum volume of 592 800 cubic metres over five years. This volume is the total of the volume offered the Squamish First Nation in the agreement signed in 2005, which was 98 800 cubic metres over a five-year period, and the volume offered in 2006 which was 98 800 cubic metres annually over five years. The effective date of the five-year period will be the date on which the non-replaceable licence is signed.

In December 2006, the Minister of Forests and Range and the licensee signed an instrument amending the Tree Farm Licence to reflect the orders issued under the *Forestry Revitalization Act* described above. In accordance with this instrument, the Timber Sales manager may dispose of a total of 42 224 cubic metres of the AAC annually and the Regional Executive Director or District Manager may dispose of a total of 98 823 cubic metres of the AAC annually. As noted above, this leaves 109 473 cubic metres of the AAC in effect as available to the licensee at the time of this determination.

New AAC determination

Effective March 28, 2007, the new AAC for TFL 38 will be 250 500 cubic metres. The new AAC is unchanged from the current AAC. Of this AAC, I have specified 79 500 cubic metres as attributable to the Wild Spirit Places pending resolution of their status under the Sea-to-Sky Land and Resources Management Plan. This AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination.

Information sources used in the AAC determination

Sources of information referenced for the purposes of this AAC determination include:

- Letter from Northwest Squamish Forestry Limited Partnership to Deputy Chief Forester regarding changes to data submitted in the 2002 Information Package. February 19, 2007.
- Letter from Northwest Squamish Forestry Limited Partnership to Deputy Chief Forester regarding recommendations for TFL 38 AAC determination. March 11, 2007.
- Yield Tables For Natural And Managed Stands: Management Plan 9 on TFL 38. April 15, 2002. Natural stands accepted by MoF Forest Analysis and Inventory Branch, May 27, 2002. Managed stand yields accepted by MoF Research Branch May 17, 2002.
- *Tree Farm Licence #38, Information Package for Sustainable Forest Management Plan 9*. Revised October 2002. Prepared by Timberline Forest Inventory Consultants for Interfor. Accepted by MoF Forest Analysis and Inventory Branch, November 5, 2002.
- *Tree Farm Licence # 38, Timber Supply Analysis Report for Forest Management Plan 9*. Submitted October, 2002. Resubmitted December 14, 2003, accepted January 5, 2005.
- *Proposed Management Plan No. 8 for TFL 38*. Submitted December 1997 for the period from 1997 to December 31, 2002. Interfor.
- Requests to Extend Management Plan No. 8 submitted yearly, from 2003 to 2007. Interfor. (No Draft Management Plan 9 has been submitted.)
- Management Plan Extension approval letters dated 2003 to 2008. Deputy Chief Forester.
- *TFL 38 Twenty-year Plan*. April 2003. Prepared by Timberline Forest Inventory Consultants for Interfor.
- *Procedures for Identifying and Approving Existing Ungulate Winter Ranges*. August 6, 1998 memo from Larry Pedersen, MoFR and Jon O’Riordan, Ministry of Environment.

- *Procedures for Factoring Visual Resources into Timber Supply Analyses*. 1998. BC Ministry of Forests. Province of British Columbia, Victoria.
- Letter from the Minister of Forests and Range to the chief forester stating the economic and social objectives of the Crown. July 4, 2006.
- *Forest and Range Practices Act*, 2002 and amendments.
- *Forest and Range Practices Regulations*, 2004 and amendments.
- *Forest Practices Code of British Columbia Act*, 1995, and amendments.
- *Forest Practices Code of British Columbia Act Regulations*, 1995, and amendments.
- *Forest Practices Code of British Columbia Guidebooks*, MoFR and MELP.
- *Ministry of Forests and Range Act*, (consolidated to March 30, 2006).
- *Landscape Unit Planning Guide*. Forest Practices Code of British Columbia. 2000. BC Ministry of Forests and Ministry of Environment, Lands and Parks. Province of British Columbia. Victoria.
- *Managing Identified Wildlife: Procedures and Measures. Volume 1*. 1999. BC Ministry of Forests. Province of British Columbia.
- *The Identified Wildlife Management Strategy (IWMS) Version 2004: Procedures for Managing Identified Wildlife and Accounts and Measures for Managing Identified Wildlife*.
- *Riparian Management Area Guidebook. Forest Practices Code of British Columbia*. 1995. BC Ministry of Forests and Ministry of Environment, Lands and Parks. Province of British Columbia. Victoria.
- Input received from First Nations through the consultation process.
- A method for Predicting the Yields of Douglas-fir Plantations with Natural Regeneration. January 27, 2002. Prepared for Interfor by J.S. Thrower and Associates.
- Reductions for NP area for TFL 38. February 28, 2002. Memo to A. Nussbaum MoFR from C. Mista of J.S. Thrower and Associates.
- Site Index Adjustment of the Major Commercial Species in the Coastal Western Hemlock Biogeoclimatic Zone on Tree Farm Licence 38 (J.S. Thrower and Associates, 2001).
- Tour of TFL 38 with Deputy Chief Forester, Interfor staff and MoFR staff, from the Squamish Forest District, Coastal Forest Region, and Forest Analysis and Inventory Branch. September 2004.
- Deputy Chief Forester and MoFR staff meeting with NWSLP December 12, 2006 to discuss issues and scheduling of an AAC Determination and MP #9.

- Technical review and evaluation of current and expected operating conditions through comprehensive discussions between the deputy chief forester, and MoFR district, regional and branch staff at the AAC determination meeting held in Victoria, March 16, 2007.
- *Summary of dead potential volume estimates for management units within the Coastal Forest Region.* March 2006. Ministry of Forests and Range.
- Draft Landscape Unit Plan for the Elaho Landscape Unit, (Interfor) [95% complete].
- Draft Landscape Unit Plan for the Upper Squamish Landscape Unit, (Interfor) [95% complete].
- Updated Recreation Features Inventory for TFL 38, (RRL Recreation Resources Ltd.) [complete and accepted by MOF, 2002].
- TFL 38 Visual Landscape Inventory Update, (RRL Recreation Resources Ltd)[complete].
- Terrain Ecosystem Mapping, B.A. Blackwell and Associates, completed 2001.
- TFL 38 Overwintering Bald Eagle Habitat Management Strategy, (Interfor) [completed 2002].
- TFL 38 Moose Winter Range Management Strategy, (Interfor) [completed 2002]. This strategy has been approved by government as Ungulate Winter Range U-2-010, established March 17, 2005.
- TFL 38 Mountain Goat Winter Range Assessment, (Ecologic Consulting Ltd) and TFL 38 Mountain Goat Winter Range Management Strategy, (Interfor) [completed 2002]. We are in the process of having the objectives approved by WLAP under the GAR 7(2) and 10(1).
- TFL 38 Grizzly Bear Habitat Rating Assessment (Ecologic Consulting) and TFL 38 Grizzly Bear Habitat Management Strategy, (Interfor) [completed 2003].
- TFL 38 Recreation Site Assessment, (RRL Recreation resources Ltd.) [completed December 2003].
- Tree Farm Licence No. 38 Replacement Licence Document, June 2, 2001.
- Soo TSA Timber Supply Analysis, MoFR, July 1999.
- Soo TSA Rationale for Allowable Annual Cut (AAC) Determination, October 2000.
- TFL 38 Rationale for Allowable Annual Cut (AAC) Determination, August 1998.
- Establishment of free-growing guidebook – Vancouver Forest Region.
- Fish-Stream Identification Guidebook.
- Spotted Owl-Special Resource Management Zone.

Role and limitations of the technical information used

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

The computerised analytical models currently used to assess timber supply unavoidably simplify the real world and inevitably involve uncertainty in many of the inputs, due in part to variations in physical, biological and social conditions. While ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of these uncertainties, technical information and analytical methods alone cannot incorporate all the social, cultural and economic factors relevant to forest management decisions, nor do they necessarily provide complete answers or solutions to the forest management problems addressed in AAC determinations. However, they do provide valuable insight into potential outcomes of different resource-use assumptions and actions—important components of the information that must be considered in AAC determinations.

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

Statutory framework

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

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, which include those required under Section 8 of the *Forest Act*.

Guiding principles for AAC determinations

The chief forester has expressed the importance of consistency in judgement in making AAC determinations. I also recognize the need for consistency of approach, and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and have adopted them as described below in making my AAC determination for TFL 38.

Rapid changes in social values and in our understanding and management of complex forest ecosystems may affect our interpretation or weighing of the information used in AAC determinations. In making the large number of periodic determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in incorporating such changes and associated uncertainties. To make my approach in these matters explicit, I have set out the following body of guiding principles. In any specific circumstance where I may

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

Two important ways of dealing with uncertainty are

- (i) minimizing risk, in respect of which in making AAC determinations, I consider particular uncertainties associated with the information before me, and attempt to assess and address the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and
- (ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge—a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the following guiding principles.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I intend to reflect as closely as possible those operability and forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to *increase* the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to *reduce* the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia* (‘the Code’)—which is now in transition to the *Forest and Range Practices Act* (FRPA).

In many areas, the timber supply implications of some legislative provisions, such as those for landscape-level biodiversity, remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 38, as deputy chief forester, I have followed the same approach.

As British Columbia progresses toward completion of strategic land-use plans, in some cases the eventual timber supply impacts associated with the land-use decisions resulting from the various regional and sub-regional planning processes remain subject to some uncertainty before formal approval by government. In determining AACs, I will not speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government.

In some cases, even where government has made a formal land-use decision, it is not necessarily possible to analyze and account for the full timber supply impact in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, the establishment of resource management zones and resource management objectives and strategies for those zones. Until such implementation decisions are made it would be impossible to assess in full the overall impacts of land-use decisions. In such cases, the legislated requirement for frequent AAC reviews will ensure that future determinations address ongoing plan implementation decisions. Whenever specific protected areas have been designated by

legislation or order-in-council, these areas are deducted from the timber harvesting land base and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting resource management objectives such as biodiversity.

TFL 38 lies within the administrative boundaries of the Squamish Forest District, which also form the boundary of the area covered by the Sea-to-Sky Land and Resources Management Plan (LRMP). The stated goal of this plan is to balance and integrate the use of public land outside parks and protected areas, for the LRMP area. Land use status and forest practice considerations clarified by approval of the final LRMP can be taken into account in a future AAC determination, which I expect will occur considerably sooner than the statutorily required five-year period. I will comment further on this matter in later sections of this rationale.

When appropriate, I will consider information on the types and extent of planned and implemented intensive silviculture activities as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of their timber supply effects.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine many outdated AACs between 1992 and 1996. In any case, the data and models available today are superior to those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgements to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from decisions in recent years made by the Supreme Court of Canada. I am aware of the Crown's legal obligation to consult with First Nations regarding asserted rights and title in a manner proportional to the strength of their claimed interests and the degree to which the decision may impact these interests. In this regard, I will consider any information brought forward respecting First Nations' aboriginal interests, including operational plans that describe forest practices to address First Nations' interests. As I am able, within the scope of my authority under section 8 of the *Forest Act*, I will address those interests. When aboriginal interests are raised that are outside my jurisdiction, I will endeavour to forward these interests to other decision-makers for consideration.

The AAC that I determine should not be construed as limiting the Crown's obligations under the Court's decisions in any way, and in this respect it should be noted that my

determination does not prescribe a particular plan of harvesting activity within TFL 38. It is also independent of any decisions by the Minister of Forests and Range with respect to subsequent allocation of wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests and Range as set out in Section 4 of the *Ministry of Forests and Range Act*, and of my responsibilities under the *Forest Act*, *Forest Practices Code of British Columbia Act* (the Code) and under the *Forest and Range Practices Act* (FRPA).

Because the new regulations of the *Forest and Range Practices Act* are designed to maintain the integrity of British Columbia's forest stewardship under responsible forest practices, it is not expected that the implementation of the legislative changes will significantly affect current timber supply projections made using the Code as a basis for the definition of current practice.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in this AAC determination, I am assisted by timber supply forecasts provided to me by the licensee as part of the MoFR Timber Supply Review program.

For each AAC determination a timber supply analysis is carried out using an information package including data and information from three categories: land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced. These include sensitivity analyses to assess the timber supply effects of uncertainties or changes in various assumptions around a baseline option, normally referred to as the 'base case' forecast.

The base case forecast may incorporate information about which there is some uncertainty. Its validity, as with all the other forecasts provided, depends on the reliability of the data and assumptions incorporated into the computer model used to generate it. Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

These adjustments are made on the basis of informed judgment, using current information available about forest management, which 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 it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed.

Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgments that may in part be based on

uncertain information are essentially qualitative in nature and, as such, subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Timber supply analysis

The previous holder of TFL 38, International Forest Products Ltd., ('Interfor') contracted with Timberline Forestry Inventory Consultants ('Timberline') to perform the timber supply analysis in 2002. For the analysis, Timberline used its proprietary simulation model CASH 6 (Critical Analysis by Simulation of Harvesting, version 6.2g). This simulation model was used to project the availability of timber in the TFL under a variety of scenarios. The CASH 6 model has long been accepted by the MoFR's Forest Analysis and Inventory Branch for use in providing timber supply analysis in support of AAC determinations, and has been used for many TFLs in British Columbia. Based on my experience and that of my staff in examining the results from this model, I am satisfied that it is capable of providing adequate projections of timber supply for my consideration.

In particular, the CASH 6 model uses both a spatially implicit and spatially explicit geographic approach in defining the land base and inventory in order to adhere as closely as possible to the intent of the forest cover requirements applied to harvesting. The model is able to simulate the imposition of overlapping forest cover objectives on timber harvesting and resultant forest development. These objectives—in the present case, in the form of green-up requirements related to disturbance, and retention requirements for old growth—are addressed by placing restrictions on the distribution of age classes to define maximum or minimum limits on the amount of area in young and old age-classes found in specified components of the forest.

Depending upon assumptions about how the rate of harvest is permitted to change over time—i.e. the 'harvest flow'—a number of different harvesting scenarios can be produced. For the analysis under consideration for TFL 38, the harvest flow objectives incorporated in the base case included:

- (1) maintaining an initial harvest level which achieves the current AAC to provide for short-term timber supply requirements;
- (2) (with the exception of the first decade) limiting any reductions in harvest level to less than 10 percent of the level prior to the change;
- (3) achieving a non-declining, sustainable, long-term harvest level over a 250-year period with a non-declining growing stock; and
- (4) prohibiting the harvest level from falling at any point below the long-term harvest level.

(Harvest flows projected under alternative objectives are discussed below, in 'Alternative Harvest Flows'.)

With this set of objectives applied, the final version of the timber supply analysis (revised in March, 2004 and corrected in December 2004) shows a base case harvest forecast (net of non-recoverable losses) in which the initial harvest rate is 250 500 cubic metres per

year, identical to the current AAC. This level is maintained for 5 years before dropping by 10 percent to 225 000 cubic metres per year. After 5 years at this level, the harvest is projected to drop again, by approximately 3.3 percent, to 217 500 cubic metres per year, the long-term level.

The base case reflects current management on the date of commencement of the preparation of MP No. 9. While the information package for MP No 9 was approved on November 4, 2002, MP No. 9 has not yet been submitted for approval, due to uncertainties associated with the Sea-to-Sky LRMP which has not yet been approved by Cabinet, as well as ongoing negotiations with First Nations, transfer of TFL ownership and uncertainty in the size and locations of Wild Spirit Places (WSPs). Instead, I have approved a series of extensions to MP No. 8. Pending Cabinet's approval of the LRMP, the range of potential implications for timber supply of the management of the Wild Spirit Places has been examined in a separate sensitivity analysis discussed later in this rationale (see 'Other information—*Wild Spirit Places – harvest level partition*').

The information and management assumptions incorporated in the base case included:

- an updated forest inventory database
- current management regimes
- the current definition of operability
- an updated recreation features inventory
- an updated visual landscape inventory
- the definition of biodiversity in accordance with the *Landscape Unit Planning Guide* (LUPG)
- the Draft Landscape Unit Plan, including draft Old Growth Management Areas (OGMAs)
- updated stream riparian classifications
- definition of riparian reserves on Terrain Resource Information Management Program (TRIM)-based streams consistent with the Riparian Management Area Guidebook, and with extended buffers on S5 and S6 stream classifications
- wildlife management strategies for grizzly bear, mountain goat, bald eagle, and moose
- slope stability mapping
- new Terrestrial Ecosystem Mapping (TEM) of TFL 38
- new Potential Site Index Estimates for the main commercial species on TFL 38
- variable retention harvesting
- definition of merchantable stands and utilization standards
- definition of non-recoverable losses (NRLs)
- minimum harvestable ages
- silvicultural standards, and
- forest health. Associated details may be found in the analysis document.

The base case analysis showed that for the first 60 years most of the harvest comes from existing mature forest, reflecting the 'oldest-first' harvest scheduling strategy of maximizing the harvest by capturing the higher volumes in the mature forest first (see below, 'Harvest sequencing'). At year 61, the harvest from existing natural stands is projected to begin shifting into future managed stands. The average area harvested is projected to remain relatively constant over time, at approximately 415 hectares per year.

Over the forecast period, the average volume harvested per hectare is projected to fluctuate about an approximate average of 550 cubic metres. Although the projected average age at harvest drops sharply during the shift to harvesting in second-growth stands, the volume per hectare remains relatively consistent, due to higher expectations for the yields from managed stands. The average age of harvested stands is projected to fall as the harvesting moves from natural stands to second-growth, stabilizing by year 60 at roughly 60 to 70 years.

In addition to the base case forecast, I was provided with several alternative harvest flows, a number of sensitivity analyses carried out using the base case as a reference, a 20-Year Spatial Feasibility study, and an analysis examining the timber supply implications for TFL 38 of avoiding harvesting in the Wild Spirit Places. These analyses, and additional work and information noted in the following sections, have been helpful in the considerations and reasoning leading to my determination.

From my review of the timber supply analysis, including the age-class structure of the forests in the TFL over time, and from discussions with MoFR analysts, I am satisfied that the base case forecast provides a suitable basis of reference for use in my considerations in this determination. In my determination, I have been mindful that the year of origin of the data used in the base case projection was 2001 and that the reference year for the projection was 2002 while this AAC determination is being made in 2007. I have accounted for this as discussed in 'Reasons for Decision'.

As discussed below in 'Twenty-Year Plan', the spatial feasibility analysis which was carried out to demonstrate that the initial harvest level would be spatially obtainable for 20 years was applied to a non-declining, even-flow projection of 217 500 cubic metres per year. However, with interpretation as discussed in that section, this analysis has been helpful in validating the AAC I have determined for the TFL.

In my considerations set out below, in many cases where I have concluded that an assumption was appropriately modelled in the base case, I have noted my agreement with the approach as already documented in the licensee's analysis, but I have not reiterated those details. Conversely, I have explained my consideration of any assumption which I have found to be of concern for any reason, such as lack of clarity in the analysis report, apparent divergence from current management practice, or where a high level of input has been received from the public or from a First Nation.

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

Section 8 (8)

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

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

Land base contributing to timber harvest

- General comments

The total area within the boundary of TFL 38 is estimated in the analysis to be 189 287 hectares, including 256 hectares of Schedule A lands. Of this total, about 134 930 hectares are considered to be non-forested areas or non-productive forest and are not assumed to contribute to the timber supply, leaving a total identified productive forest area in the TFL of 54 357 hectares. In deriving the timber harvesting land base (THLB) in the analysis, deductions are made from the productive forest area to account for inoperable areas and for other factors as discussed below. While productive forests that are excluded from the timber harvesting land base for these reasons do not contribute to

timber supply directly, the cover they provide contributes to meeting objectives for many resources other than timber, including wildlife habitat, visual quality and biodiversity.

In 2006, the Schedule A land base of TFL 38, including 200 hectares of productive forest, was removed from the TFL. Only 23 hectares of this forest were included in the timber harvesting land base and, for the rest of the removed productive forest, I am advised by MoFR staff including the ministry's Forest Analysis and Inventory Branch timber supply analyst, that the reduced forest cover contribution will not noticeably affect the meeting of adjacency or other objectives. I am therefore satisfied that the implications for timber supply from removing the relatively small area of Schedule A lands are negligible.

After accounting for all the necessary land base exclusions (and disregarding, as noted, the subsequent small removal of 23 hectares of Schedule A land) the current timber harvesting land base derived in the analysis is 32 349 hectares, as shown in Table 1.

- Land base exclusions

In deriving the current timber harvesting land base used in the analysis, a land base deduction was applied in respect of each of the factors identified in Table 2 below. In sequencing the deductions, care was taken to avoid any potential double counting associated with overlapping objectives. This avoidance has been greatly assisted by the near completion of landscape planning which allows for maximizing the advantages of overlaps for multiple objectives. After accounting for these overlaps, the resulting total area identified, and the corresponding net deduction made from the productive forest area, in respect of each of the factors listed, was as follows:

Table 1: Land base deductions in derivation of timber harvesting land base

Factor	Total area identified with factor (hectares)	Associated net deduction from productive forest (hectares)
Inoperable areas	146 449	13 122
Non-commercial brush	8	8
Existing Roads, trails and landings	449	404
Eagle Habitat	701	374
Moose Winter Range	312	250
Grizzly Bear Habitat	5384	461
Goat Winter Range	11 838	1380
Old Growth Management Areas	6969	1140
Recreation	49 036	722
Riparian Reserves	9416	1586
Unstable (Class 5) Terrain	6321	2267
Low Site Productivity	6407	294
Total reduction to prod. forest		8886
Size of reduced land base		32 349

The derivations of the figures for each factor in Table 1 are given in the *Timber Supply Analysis Information Package For Tree Farm Licence 38*, International Forest Products Ltd., Management Plan #9, prepared by Timberline, October 2002. I have reviewed and considered each of these derivations, including any assumptions made, and I am in concurrence with the derivations of each of the figures so derived, except for ‘*Economic and physical operability*’, which I have discussed further below. With that qualification, I accept that the base case projection has modelled and projected the timber supply satisfactorily in respect of the land base reductions for each of the above tabulated considerations.

Table 1 includes some factors that are required to be considered under section 8(8)(a)(v) of the *Forest Act*, respecting constraints on the amount of available timber resulting from management for resources other than timber. Therefore, while these factors—such as wildlife habitats and riparian areas—were accounted for (at least in part) by the identified exclusions of productive forest area from the timber harvesting land base which I have accepted in Table 1, they are further discussed below under ‘Integrated Resource Management Objectives’.

Other factors requiring specific consideration for land base implications, including: harvesting performance in marginally economic areas; stands predominated by deciduous species; Wildlife Tree Patches; and Not-Satisfactorily Restocked areas; as well as the aggregation procedures applied in land base considerations, are discussed under their respective headings below.

In the analysis it was assumed that 1112 hectares of productive forest will become unavailable for harvest due to construction of future roads. I have reviewed the methodology supporting this finding, and I conclude that this is a reasonable estimate and that this will leave a long-term timber harvesting land base for TFL 38 of 31 237 hectares.

- Economic and physical operability

For assessing operability, the productive forest was classified into operable and inoperable areas in consideration of factors including economics, physical accessibility, environmental concerns, problem forest types and currently available harvesting systems. Operable areas were identified as (i) operable by conventional means—requiring a minimum of 350 to 400 cubic metres per hectare; (ii) operable by helicopter—above the physical accessibility line, meeting the Vancouver Region heli-logging guidelines and with volumes of at least 400 cubic metres per hectare; and (iii) of marginal operability, with high decay factors and averaging from 250 to 400 cubic metres per hectare.

Ministry staff informed me that all of these definitions are within reasonable ranges for coastal TFLs and TSAs with similar topography. In the previous AAC determination, the (then) licensee's lack of harvesting performance in marginal stands was a cause for concern; in the current determination, this concern is reduced but not entirely eliminated for the following reason. The productive area classified as 'marginal' in this analysis is reduced to 952 hectares from the 1928 hectares in the previous analysis, due to an updated operability classification. Moreover, overlaps with other areas excluded from the timber harvesting land base, for draft OGMAs, wildlife habitat and other objectives, reduce the net area of marginally economic stands in the timber harvesting land base to considerably less than the 952 hectares of productive forest. District staff indicate that these stands will likely be harvested if they are in close proximity to other, more economic stands.

From this, and from considering that the continued presence of these stands in the timber harvesting land base provides an ongoing small opportunity for economic activity without significant risk, I have assessed that the assumptions and data incorporated in the base case with respect to economic and physical operability, including harvesting in marginally economic areas, are adequate for use in this determination.

Nonetheless, since analysis indicates some sensitivity in the timber supply to changes in the size of the land base, in preparation for the next determination, I request that the licensee monitor and report to the district manager the extent to which these marginally economic stands are utilized, as I have noted below, in 'Implementation'.

- Harvest profile

The timber harvesting land base in TFL 38 consists of stands comprised primarily of western hemlock, balsam, Douglas-fir and western red cedar. District staff have expressed concerns over the extent to which some of these species are harvested relative to their representation on the land base. The concerns relate primarily to the economics of harvesting hemlock and balsam in the upper reaches of the Elaho valley.

Statistics on the licensee's harvesting over the past five years—not including BCTS harvesting—indicate that balsam, which represents 32.7 percent of the growing stock on the timber harvesting land base in the TFL as a whole, comprised 16.9 percent of the harvest. Since 2001, however, harvesting has only taken place outside the Wild Spirit Places, where balsam comprises 29.8 percent of the profile. In recent years, hemlock stands, which comprise overall about 30 percent of the forest profile both in the TFL and

on the area outside the Wild Spirit Places, have provided a fairly representative 27 percent of the harvest. Douglas-fir, which comprises 19 percent of the profile on the total TFL, and 23 percent on the non-Wild Spirit Places land base, has provided 24 percent of the harvest. Cedar, which comprises an evenly distributed 17 percent of the profile across the land base, has provided 25.8 percent of the harvest.

Any concern with respect to harvesting the profile will apply primarily to the area where harvesting is taking place—in this case, on the area outside the Wild Spirit Places. For this area I note that hemlock and Douglas-fir are being harvested in close proportion to their representation on the land base. I am concerned, however, that balsam, at 16.9 percent, is being harvested at a significantly lower proportion than its 29.8 percent representation, while cedar, at 25.8 percent, is being harvested at a significantly higher proportion than its 17 percent representation.

I recognize that a bias of this nature in the harvesting of these species has been a general concern on the coast for roughly a decade. Although hemlock is also often under-harvested, this is not the case on TFL 38 at this time. It is not unusual for market cycles to dictate which species are harvested and when, but in this case I am concerned over the implications for timber supply in this TFL from this ongoing uncertainty. For this reason, as noted in 'Implementation', I request that the licensee monitor, and report in the next analysis, the species profile of the harvest relative to the species profile of the area that is currently available for harvest. Meanwhile, I encourage the reconciliation of these profiles to the extent possible. The fact that roads and bridging are in place to access at least some of the stands in question indicates the likelihood that their continuing contribution to the overall species profile of the timber harvesting land base is an appropriate assumption at this time.

- Deciduous species

Only coniferous volumes were included in assessing the timber supply for TFL 38. In the analysis, the deciduous components of coniferous stands were excluded from volume estimates for existing natural stands based on their percentage contribution to the stand volume. Deciduous volumes were also removed from managed stand yield tables, using projected ecosystem-based deciduous contents of stands assessed from post-harvest silvicultural regimes.

I understand that management of deciduous-leading stands has been included in the current forest development and 20-year plans, and that with more deciduous stands now removed from the timber harvesting land base for landscape unit (LU) and stand-level biodiversity considerations, only about one-third of the deciduous area included in the analysis for the 1998 AAC determination remains in the timber harvesting land base in the current analysis.

I have reviewed the methodology for excluding deciduous stand volumes from contributing to the timber supply, and I am satisfied that the process adequately reflects both current management and the representative presence of these stands in the TFL.

Existing forest inventory

- General comments

A forest inventory has been maintained for TFL 38 since 1962. The present inventory is based on interpretation of aerial photography prepared by Weldwood of Canada Limited in 1981. In 1987, an inventory of second-growth stands over 10 years of age was conducted and integrated into the Mylar map base. Since then, the inventory has been updated annually for harvesting, road construction, reforestation, and silvicultural treatments. All spatial information is prepared to the Terrain Resource Inventory Mapping (TRIM), North American Datum (NAD) 83 base.

In 1993 the Mylar map base was transferred to a 1988 orthographic photo map base made to photo control from the Ministry of Environment, Lands and Parks' (MELP)'s TRIM format (NAD 83) by Timberline. Forest attributes were added to make the database compatible with current Ministry of Forests' standards, and the inventory was converted into a geographical information system (GIS) Arc/Info digital format. The planimetric base, including forest cover, was updated by Timberline to 1994 1:15,000 colour photography. This project updated altered geographic features and upgraded indistinct areas in the original orthographic photography. In 2001, a certified classifier from Timberline corrected some known errors in forest cover attributes for the upper Elaho region. In addition, in 2001, several forest cover polygons with incorrect site index assignments were corrected. A Terrestrial Ecosystem Mapping (TEM) project has also been completed.

In 1998, MoFR completed an inventory audit for TFL 38. The results of the audit showed that:

- inventory volumes for stands greater than 60 years of age were found to be statistically acceptable;
- site indices for young stands, aged higher than free-to-grow but younger than 60 years, were generally underestimated in the inventory. A site index adjustment project was completed to address this problem.

For the analysis, the inventory for TFL 38 has been adjusted for disturbance and projected to the year 2001.

Inventories available for resources other than timber in the TFL include: a Recreation Features Inventory; a Visual Landscape Inventory; Operability Mapping; classifications of streams and riparian areas; information on Grizzly Bear habitat, Moose habitat, Mountain Goat habitat, and Eagle Roosting Sites; Terrestrial Ecosystem Mapping; Potential Site Index Estimates; and Terrain Stability Mapping.

In view of the considerable work undertaken in recent years to update and upgrade the inventory for TFL 38, I am reassured that the licensee has responded to a multiplicity of resource values and public sensitivities; I am satisfied that the inventory, as currently projected, provides the best available information, and is suitable for use in the timber supply analysis supporting this determination.

- Aggregation procedures

To reduce the complexity of the description of the forest for the purposes of simulating timber supplies, the aggregation of individual forest stands is necessary. To avoid obscuring biological differences in stand productivity, stands are grouped into analysis units on the basis of similar species and site productivity. To avoid obscuring differences in management objectives and prescriptions, stands are grouped into landscape units and resource emphasis zones on the basis of similarity of management objectives. I have reviewed the aggregation procedures applied in TFL 38, which are consistent with standard practice in timber supply analysis. I am satisfied that the procedure is an appropriate component of the analysis process used in generating the base case forecast.

- Volume estimates for existing natural stands

In TFL 38, forest stands older than 35 years are considered existing natural (unmanaged) stands. In the analysis, these were categorized into two groups; ‘young’ stands of 140 years or less, and ‘old’ stands of 141 years or more.

- Old natural stands

The TFL includes 20 222 hectares of stands older than 140 years. Since the forest cover inventory for the TFL does not include all of the attributes of a standard MoFR FC1 inventory, the volume tables used in the analysis for these older stands are based on Average Volume Lines (AVLs). I have reviewed, and find no fault in, the method used for assigning these stands to the analysis units for which volumes were computed from the 622 inventory ground plots within the timber harvesting land base (with deciduous volumes excluded). For these stands, in the 1998 inventory audit the difference between the average AVL volume of 517 cubic metres per hectare and the average audit volume of 503 cubic metres per hectare was found to be not statistically significant. The Inventory section staff of MoFR’s Forest Analysis and Inventory Branch (FAIB) identified no concerns in accepting the natural stand yield tables for use in the current analysis.

- Young natural stands

Young natural stands, between 36 and 141 years old, occupy 3356 hectares in TFL 38. Most of these stands are less than 10 hectares in size; the largest is 65 hectares. Estimates of the timber volumes in these stands were projected using yield tables produced by the Variable Density Yield Prediction (VDYP) batch program (Version 6.6d), using stand attributes from the forest cover inventory. Stands were grouped into analysis units based on Biogeoclimatic Ecosystem Classification subzones.

A small number of stands—less than one percent of the land base of the young, natural stands—with site index class 5, were included in the timber harvesting land base, although stands with this site index are not normally considered merchantable in coastal management areas. This arose because, for the current analysis, the licensee had corrected most but not all of the site indices for stands formerly with this low site index, but a small number remained uncorrected. Much of the area in question, however, is now assumed to be harvestable, given its proximity to higher value stands. In view of the

significantly improved inventory information discussed above, and noting that the associated land base is considerably smaller in this analysis than in the previous analysis when the inclusion of 'low-site' stands was of some concern, I am satisfied that the inclusion of the relatively small number of these stands does not harm the integrity of the base case projection.

The 1998 MoFR inventory audit showed that the analysis unit volumes for the young natural stands were not statistically different from the audit volumes.

The yield tables for natural stands (and managed stands) were developed by J.S. Thrower and Associates Ltd. and are documented in the April 2002 report '*Yield Tables for Natural and Managed Stands: Management Plan 9 on TFL 38*'. The tables were accepted by MoFR Forest Analysis and Inventory Branch, May 27, 2002, and MoFR Research Branch, May 17, 2002.

A sensitivity analysis showed that if the volume estimates for all existing natural stands were increased or decreased by 10 percent, the resulting forecast was identical to the base case for the first ten years, but with the lower estimates, dropped slightly below the base case thereafter (by less than 10 percent), and with higher estimates, remained mostly slightly above the base case. This less-than-proportional relationship indicates some flexibility in the forecast to absorb potential changes in information over time.

Based on all of the foregoing information, I conclude that stand yields were modelled in the base case in accordance with standard procedures accepted by government.

I therefore accept the estimates of timber volumes in existing natural stands as adequate for use in this determination.

- *Coastal log grades*

On April 1, 2006, new log grades were implemented for the BC Interior. Under the previous grade system, logs were assessed according to whether the trees they came from were alive or dead at the time of harvest. Under the new system, a log will be graded based on its size and quality at the time it is scaled or assessed, without regard to whether it was alive or dead at harvest. These 'dead potential' trees (i.e. dead trees that are potentially merchantable) will now also be accounted for in AAC determinations.

On the BC Coast, logs from dead trees have been harvested, scaled and charged to the AAC for some time now. Dead western red cedar and old growth Douglas-fir stems may remain sound and suitable for milling for many years. However, they are currently not included in the inventory and have therefore not been accounted for in AAC determinations. With the change in the BC Interior it is now appropriate to account for this dead potential volume in AAC determinations for coastal units as well.

Possible sources of data for assessing the 'dead potential' volume in a TFL include inventory audit plots, VRI phase 2 ground samples, permanent sample plots, temporary sample plots, and cruise data.

For TFL 38, the estimates of timber volume used in the base case did not account for dead merchantable logs. No estimates of dead potential volume were reported for TFL 38 in the MoFR report (March 2006), *Summary of dead potential volume estimates for management units within the Coastal Forest Region*.

Several considerations present difficulties when assessing the most appropriate figure to apply in particular areas. ‘Dead potential’ volume extracted from forest stands can vary significantly over time, depending on markets and other factors. The accounting is also complicated by the relationship between ‘dead potential’ volumes and the requirement to leave coarse woody debris on the ground for biodiversity objectives.

At this time MoFR and the new licensee’s staff have no estimates for potential dead volume for TFL 38. This information should be collected over the next five years. I note that a potentially comparable average percentage volume obtained for the adjacent Soo TSA was 4.7 percent. Applying this estimate to TFL 38, however, in order to obtain a figure applicable to only the timber harvesting land base, is an unreliable extrapolation which is subject to several uncertainties including those noted above.

Nonetheless, having reviewed this information with MoFR staff, I conclude in my “Reasons for Decision” that on this account the timber supply in TFL 38 has been underestimated by an unquantified amount over the forecast period. In ‘Implementation’ I have recommended that the licensee and MoFR staff work together to determine an appropriate method of tracking actual utilization of dead potential volumes so that this factor can be more fully accounted for in the next determination.

Expected rate of growth

- Site productivity estimates

Inventory data include estimates of site productivity for each forest stand, expressed in terms of a site index. The site index is based on a stand’s height as a function of its age. The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size.

The most accurate estimates of site productivity come from stands between 30 and 150 years of age. The growth history of stands less than 30 years of age is often not long enough to give accurate measurements of site productivity. Estimates derived from older stands underestimate site productivity as these stands are often well past the age of maximum height growth and have often been affected by disease, insects and top damage as they reach advanced age. The underestimate of site productivity based on forest inventory estimates for older stands has been verified in several studies (e.g. Old-Growth Site Index or OGSi study) in the province. These studies have confirmed that when old stands are harvested and regenerated, the site productivities realized are generally higher than those predicted for older stands from estimated site indices based on inventory data.

For natural, unmanaged stands in TFL 38, site indices for stands aged 36 to 140 years were taken from the forest inventory. For stands aged over 140 years, volumes were derived from the inventory audit plots; site indices were not used.

For managed stands, the Terrestrial Ecosystem Mapping (TEM) was accepted by MoFR in March 2001. Based on the TEM and site index adjustment project, in February, 2002 MoFR accepted Potential Site Index adjustments for Post Harvest Stands. Adjustments were not applied to Mountain Hemlock (MH) subzones or to the Coastal Western

Hemlock CWHvm2 variant. The MH subzones were not adjusted in view of the very limited harvesting history in these high elevation stands. Very little of the CWHvm2 occurs in the timber harvesting land base of TFL 38, so no field sampling was done; instead, site indices were derived from the inventory, and I am satisfied that any associated timber supply implications are minimal.

Site index adjustment projects for TFL 38 are described in two reports: *A method for predicting the yields of Douglas-fir plantations with natural regeneration*, by J.S. Thrower and Associates Ltd., 2002, and *Site index adjustment of major commercial tree species in the Coastal Western Hemlock biogeoclimatic zone on TFL 38*, again by J.S. Thrower and Associates Ltd.

I am satisfied that all reasonable efforts were made to ensure the use of the best available site index information in the analysis. However, to minimize future uncertainties, I encourage the licensee to monitor growth performance in relation to modelled or projected productivity on TFL 38. If and when MH stands are harvested, Potential Site Indices should be developed.

- Volume estimates for regenerated managed stands

Managed stands in TFL 38 are those stands that are less than 35 years old, that have been harvested once, and in which density has been controlled.

In the analysis, the standard MoFR growth and yield program, Table Interpolation Program for Stand Yields, or TIPSy (Batch Version 3.0a), was used to estimate the timber volumes for regenerated managed stands younger than 35 years and all post harvest, regenerating (PHR) stands. Inputs to the program included: improved estimates of potential site index (PSI) for PHR stands using the results of the site index adjustment (SIA) and terrestrial ecosystem mapping (TEM) projects for TFL 38; silviculture regimes for existing and future PHR stands developed by Interfor; the yield implications from planting improved stock in future PHR stands, and; improved estimates of operational adjustment factors (OAFs, see next section) from the TEM project.

At the time of the analysis, the TIPSy program did not provide yield estimates for natural regeneration occurring in forest stands. The firm J.S. Thrower and Associates Ltd. developed a proprietary procedure using simulations from the MoFR's Tree And Stand Simulator (TASS) model, to produce adjustment coefficients that were used to modify the TIPSy yield table outputs to reflect natural regeneration assumptions.

Yield tables were developed for each stand and aggregated based on BEC groupings.

The analysis recognized three eras for managed stands: Stands established between 1967 and 1992; stands established between 1993 and 2001; and future stands (as of the date of analysis).

The 1967 to 1992 stands were typically logged, burned and planted. Juvenile spacing was modelled on 608 hectares of the mesic and richer sites. The average site index was 31.1 metres and the average establishment density was 1866 stems/hectare.

The 1993 to 2001 stands (122) were typically logged and planted with genetically improved Douglas-fir and western red cedar. Genetic gain was modelled on 979 hectares and juvenile spacing was modelled on 180 hectares.

The 'future' stands reflect current practice including variable retention and Wildlife Tree Patches. Genetically improved stock is assumed to continue to be used for Douglas-fir and for western red cedar stands. Juvenile spacing is projected to occur on 1258 hectares and the average planting density is 2441 stems per hectare. The average site index is 26.2 metres, with a lower index attributable to the inclusion of MH and CWHvm2 stands.

Sensitivity analysis showed that when managed stand yields were increased or decreased by 10 percent, the 10-percent reduction reduced the projected long-term harvest level (LTHL) by 8 percent, while the 10-percent increase added 9.6 percent to the LTHL.

The managed stand yields were reviewed and accepted by MoFR Research Branch for use in the analysis, with concern expressed that, in view of the minimal harvesting performance in the high elevation MH stands to date but with the possibility of future harvest in these areas, the licensee should endeavour to confirm the assumed yields used in timber supply analysis for MH stands. Overall, having reviewed the methodology for their development, I consider the volume estimates for regenerated, managed stands to be the best available information in support of the base case.

- Operational adjustment factors

The TIPSYS projections of volume yields for managed stands are initially based on ideal conditions, assuming full site occupancy and the absence of pests, diseases and significant brush competition. However, certain operational conditions, such as a less-than-ideal distribution of trees, the presence of small non-productive areas, endemic pests and diseases, or age-dependent factors such as decay, waste and breakage, may cause yields to be reduced over time. Two operational adjustment factors (OAFs) are therefore applied to yields generated using TIPSYS, to account for losses of timber volume resulting from these operational conditions. OAF 1 is designed to account for factors affecting the yield curve across all ages, including small stand openings, uneven tree distribution, endemic pests and other factors. OAF 2 accounts for factors whose impacts tend to increase over time such as decay, and waste and breakage. Standard provincial reductions of 15 percent for OAF 1 and five percent for OAF 2 are often applied in timber supply analysis but these can be adjusted based on local conditions.

For the analysis the standard OAF 2 of five percent was applied. The standard OAF 1 of 15 percent was adjusted using site specific information for small unproductive openings, obtained through the TEM project. MoFR Research Branch staff approved the adjusted factors for use in the analysis. I am satisfied that their application is appropriately reflected in the base case projection.

- Minimum harvestable ages

A minimum harvestable age is an estimate of the earliest age at which a forest stand has grown to a harvestable condition. The minimum harvestable age assumption mainly affects when second-growth stands will be available for harvest within the timber supply model. This, in turn, affects how quickly existing stands may be harvested such that a

stable flow of timber harvest may be maintained. In practice, many forest stands will be harvested at much older ages than the minimum harvestable age, due to economic considerations or forest cover constraints on harvesting that arise from managing for such values as visual quality, wildlife and water quality.

As noted earlier, in ‘volume estimates for existing natural stands’, the yield tables for older natural stands used in the analysis for TFL 38 are based on AVLs. These stands are older than 140 years old and are assumed to be available for harvest now. For managed stands, a minimum harvestable age is derived for each yield curve based on the age at which the culmination of mean annual increment is reached, that is, its ‘culmination age’.

I agree with the statement in the analysis report that the criteria for establishing minimum harvestable ages represent a somewhat arbitrary approach that leads to a ‘conservative estimate of this age’. Certainly many stands—especially managed stands—may be merchantable at lower ages. However, a sensitivity analysis showed that the base case projection was practically insensitive to an increase or decrease of 10 years in minimum harvestable ages.

In the analysis for the 1998 AAC determination, minimum harvestable ages were based on volume criteria, and district staff questioned the viability of harvesting stands of 250 cubic metres per hectare. Under the criteria applied in the current analysis, the volume at minimum harvestable age will be over 500 cubic metres per hectare for the majority of analysis units, except for high elevation stands, which are not conventionally operable and will likely only be harvested under optimal economic conditions.

From the foregoing I am satisfied that while the current criteria for establishing minimum harvestable ages may be somewhat conservative, they do avoid the concern over harvesting in lower-volume stands, and in my experience they are based on comparable criteria applied in analyses for many timber supply areas and TFLs in BC; I therefore consider them to be adequate for use in this determination.

- Gains from the use of select seed

The use of select seed with improved genetic traits can increase the timber volumes in managed stands in the long term and shorten the time required for a forest stand to reach a green-up height or the minimum harvestable age. The quantity and quality of select seed available in the province have increased in the past decade, and are projected to increase further. Licensees are required to use select seed when available.

Stands originating from 1993 to 2001 in TFL 38 were typically logged and planted with genetically improved Douglas-fir and western red cedar stock. For existing post-harvest, regenerating (PHR) stands from 1993 to 2001, genetic volume gains of 3-percent for cedar and 5-percent for Douglas-fir were modelled on 979 hectares. Genetically improved stock continues to be used for Douglas-fir and cedar stands, and corresponding gains were applied to 9518 hectares for future PHR stands. A sensitivity analysis showed that increasing the managed stand yields in the TFL by 10 percent increased the long-term harvest level by a nearly corresponding 9.6 percent.

Having reviewed this factor with MoFR staff, I am satisfied that current and expected use of select seed are adequately accounted for in the base case analysis.

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

Regeneration delay

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings. Changes in regeneration delay—either lengthening or shortening—can affect the timber supply by altering both the time at which a stand reaches green-up in order to satisfy adjacency requirements, and the time at which it reaches a minimum harvestable age.

In the analysis, regeneration delays of one or two years were assigned to analysis units, corresponding to the age and timing of the planted stock. This is consistent with the licensee’s practice of planting all harvested areas within three years, and usually sooner, using two-year-old stock.

A sensitivity analysis, performed to investigate the implications for timber supply of increasing or decreasing the regeneration delay by one year, showed only very small changes from the LTHL projected in the base case, the maximum reduction in the LTHL when the regeneration delay was increased by one year being 1.6 percent.

I am assured by district staff that the regeneration delays modelled in the base case are a reasonable reflection of the maximum delay that may be expected from the licensee’s history of planting performance, and in view of the low sensitivity in the timber supply projection to changes in this delay, I accept the values as modelled. However, if harvesting becomes more common in the MH zone, the regeneration delays experienced at the associated higher elevations should be closely monitored.

Not-satisfactorily-restocked areas

Not-satisfactorily-restocked (NSR) areas are areas where timber has been removed, either by harvesting or by natural causes, and a stand of suitable trees and stocking has yet to be established. Where a suitable stand has not been regenerated and the site was harvested prior to 1987, the classification is ‘backlog’ NSR. All other NSR is considered ‘current’ NSR.

There are no backlog NSR areas in TFL 38, and no additional areas are identified for site rehabilitation. However, during regular inventory updates, and from the TEM project, areas formerly classified as ‘non-commercial brush’ were re-classified as 92 hectares of productive forest, of which 64 hectares are now located in the timber harvesting land base. To reflect this in the analysis, these areas were assigned an age of minus one year, and considered part of the NSR land base, on the assumption that they would be regenerated within one year.

The licensee’s 2002 Information Package noted that not all of the 2001 harvest depletions were accounted for in that document, since the known area of current NSR at the end of the year was 272 hectares. However, the inventory used in the timber supply analysis was updated for all harvest depletions to the end of 2001, for a total of 302 hectares of current NSR; thus the base case correctly incorporated the actual harvesting history in the TFL. I am therefore satisfied that the base case accounts adequately for NSR areas.

(iii) silvicultural treatments to be applied to the area:

I have reviewed the silvicultural harvest systems in operation in the TFL as outlined in the Information Package, and their application in the base case as to conventional, helicopter, and marginal operating areas. From discussions with district staff I accept that these systems appropriately reflect past and current harvesting performance in the analysis.

Incremental silviculture

In general, incremental silviculture includes activities such as commercial thinning, juvenile spacing, pruning and fertilizing, that are not part of the basic silviculture obligations required to establish a free-growing forest stand following timber harvesting.

One of the previous licensees did carry out a small incremental silviculture program, any implications of which for timber supply are expected to be negligible. However, as I noted earlier in 'volume estimates for regenerated stands', the effects of juvenile spacing on 180 hectares (for 1993-2001 stands) and 608 hectares (for 1967-1992 stands) were conscientiously reflected in the appropriate yield curves.

Gains from the use of seed with improved genetic traits are discussed above, in 'gains from the use of select seed'.

From this I am satisfied that the base case analysis adequately reflects current practices in the TFL with respect to incremental silviculture.

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

I have reviewed the information regarding utilization standards and am satisfied that standards consistent with the coastal practices used in TFL 38 were incorporated in the analysis.

Decay, waste and breakage

I have reviewed the information regarding allowances for decay, waste and breakage used in the base case forecast for TFL 38. The MoFR Forest Analysis and Inventory Branch reviewed and approved the loss factors for use in the analysis. I note that the appropriate operational adjustment factors, or OAFs, were applied (see above, 'operational adjustment factors') and I am satisfied that these losses were appropriately accounted for in the base case analysis.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production:Integrated resource management objectives

The Ministry of Forests and Range is required under the *Ministry of Forests and Range Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting

of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

- Forest cover adjacency requirements

In the analysis, for areas of general or integrated resource management emphasis, no more than 33 percent of the timber harvesting land base in each landscape unit was permitted to be covered by stands lower than the green-up height of three metres. Sensitivity analysis showed that the base case was insensitive to increasing or decreasing the maximum permissible disturbance by 5 percentage points, indicating adequate flexibility in the available timber supply to absorb such changes, and further that, at all the levels investigated, forest cover requirements within the IRM zone are not directly constraining the timber supply. I am satisfied that these forest cover requirements, which were modelled consistently with the assumptions applied for similar coastal management units, were appropriately accounted for in the base case.

- Visually sensitive areas

The Code and FRPA enable scenic areas to be designated, and visual quality objectives (VQOs) to be established, so that the visible evidence of forest harvesting may be kept within acceptable limits. I have reviewed the VQOs and the amounts of affected area in the productive forest and in the timber harvesting land base, as well as the associated visual absorption capabilities, maximum allowable disturbances, and required green-up heights for TFL 38. To test the sensitivity of the base case to extreme changes in VQOs, all scenic areas were first assumed to be of high sensitivity, and then of low sensitivity. The analysis results show that in either scenario the base case projection could still be met for ten decades, with a slight reduction in the LTHL thereafter under high sensitivity, and a small increase in the LTHL under low sensitivity.

The visual landscape inventory has been accepted by MoFR staff. From the relative insensitivity of the base case to the indicated changes in VQOs, I conclude that the timber supply implications of visually sensitive areas are adequately accounted for in the base case.

- Riparian management areas

Riparian management areas (RMAs) along lakes, wetlands, streams and rivers provide key habitat for fish and wildlife and help conserve water quality and biodiversity. The Code and the FRPA provide for RMAs which include riparian reserve zones (RRZs) that exclude timber harvesting and riparian management zones (RMZs) where constraints are placed on timber harvesting. As I noted earlier, in '*land base exclusions*' a total of 9416 hectares of riparian reserve area were identified, for which (net of overlaps with exclusions already applied for other objectives) a total of 1586 hectares of productive forest were excluded from contributing to the timber harvesting land base.

In the 1998 AAC determination for TFL 38, due to problems with the classification of fish bearing streams and a lack of compensation for streams not shown on TRIM mapping, the chief forester instructed the licensee to 'complete further map-based

analysis of water bodies in order to provide a better understanding of actual riparian requirements for TFL 38' (1998 AAC rationale, p. 46). In preparation for the current analysis and determination, the licensee upgraded its riparian information by classifying all streams shown on TRIM maps, using the Riparian Management Area Guidebook (MoF and MELP, 1995) and Operational Planning Regulations of the Forest Practices Code (FPC). More local input was obtained to locate fish-bearing streams. In 2001, to compensate for the many small streams that had not been included in TRIM data since they were difficult to locate, in a revised inventory the buffers for S5 streams were assigned also to S6 streams and all unclassified streams shown in TRIM data were classified as S5 streams.

Interfor also assigned a 10-metre buffer to all wetlands and lakes larger than 0.5 hectares, that is, the maximum reserve was applied to all classes. While this was done for strategic purposes and may be modified during field operations, in general, MoFR staff concur that the RRZs and RMZs modelled in the analysis reflect current practice.

I recognize and appreciate the work undertaken to upgrade and improve the riparian inventory, and I accept the resulting assumptions applied in the base case as the best available information and as an adequate reflection of current practice.

- Wildlife habitat

TFL 38 provides habitat for numerous wildlife species, including Grizzly Bear, Moose, Mountain Goat, Deer, Spotted Owl, and Bald Eagle. The Conservation Data Centre of BC maintains forest district tracking lists that name those species and plant associations which are considered to be at risk and which are known to occur, are strongly expected to occur, or have occurred in the past, within a given forest district. The Identified Wildlife Management Strategy (IWMS) addresses habitat management for specific species considered to be at risk, as described in the next section.

- Identified wildlife

'Identified wildlife' refers to two categories of wildlife designated by the Minister of Environment under FRPA. These categories are: (1) species at risk (i.e., species that are endangered, threatened, or vulnerable); and (2) regionally important species that rely on habitat that may be adversely impacted by forest or range practices on Crown land and that may not be adequately protected by other management strategies, such as those for biodiversity or riparian management. The establishment of these categories of species enables a number of provisions under FRPA to be used to manage habitat for identified wildlife; including Wildlife Habitat Areas (WHAs) and objectives, and General Wildlife Measures and objectives.

The provincial government announced its Identified Wildlife Management Strategy (IWMS) Volume I in February 1999. The IWMS Version 2004 contains an updated list of identified wildlife, updated species accounts, and updated procedures for implementing the IWMS. Government has limited the impact of management for identified wildlife to a maximum of one percent of the short-term harvest level for the province.

Seven species of identified wildlife are considered likely to occur within TFL 38, Mountain Goat, Grizzly Bear, Rubber Boa, Tailed Frog, Bull Trout, Marbled Murrelet, and Northern Goshawk.

- Grizzly Bear Wildlife Management Zone

A Grizzly Bear Habitat Management Strategy was developed for TFL 38 in consultation with biologists from the MoFR and the Ministry of Environment. Under this strategy, each of the ecosystem-based polygons delineated through Terrestrial Ecosystem Mapping (TEM) was rated for its capability for supporting a supply of grizzly bear forage during early spring, late spring, summer, and fall. Then a six-class rating scheme ranging from 1 = high to 6 = nil—was used to rate the habitats in the TFL for suitability by season for grizzly bear forage. Under this strategy, most of the high value polygons, classes 1 to 3, are excluded from the timber harvesting land base while management is modified in some of the lower value polygons (classes 4 to 6).

From applying this strategy, as noted earlier in ‘*land base exclusions*’, a total associated area of 5384 hectares was identified, affecting 2307 hectares of productive forest and resulting in a reduction to the timber harvesting land base of 461 hectares, net of overlaps with other objectives.

The Grizzly Bear Habitat Management Zones have been submitted to the MoE for approval as Wildlife Habitat Areas (WHAs) under the Government Actions Regulation (GAR) 9(1) and 10(1), with a total of 72 WHA management zones covering an area of 7042 hectares in the current proposal. Most of the 1658 hectares additional to the 2002 data set of 5384 hectares are located in riparian or other ‘non-contributing’ areas outside the timber harvesting land base, such that the net impact of the updated proposal on the timber harvesting land base is quite small, probably 25 hectares or less. The plan has received formal review by the public, by stakeholders and by First Nations, and consultation with affected government agencies is complete pending review by MoFR. I am also advised that in accordance with the strategy, additional important forage areas that were not excluded from the timber harvesting land base will be managed or protected during harvest planning.

I am encouraged by the active dialogue between the Northwest Squamish Forestry Limited Partnership, the MoFR and MoE, to resolve these potentially difficult management issues. From my review of information related to the above considerations, I am satisfied that the forage areas and the exclusions required by the strategies developed for grizzly bear habitat, which represent current management practice, have been adequately incorporated in the base case projection, except for the small area noted, which I have addressed below in ‘*Summary of Wildlife Habitat Areas*’.

- Bald Eagle Wildlife Management Zone

A draft Over-wintering Bald Eagle Habitat Management Strategy has been developed cooperatively for TFL 38 by the licensee, the Squamish Forest District and the Ministry of Environment. The plan, which is applied by the district in reviewing Forest Development Plans, is not yet approved by Cabinet but is being implemented operationally by the licensee. The plan identifies four kinds of zones with appropriate

management for each. No harvesting is planned within Eagle Roost areas, Alternative Roosts, or Roost-Protection Buffers, and in 100-metre Eagle Roost Management Zones, a minimum of 30 percent of the zone is reserved from harvesting operations. The plan includes a 50-metre reserve zone on the Squamish River, with a management zone extending over the remainder of the flood plain. Much of the eagle plan area overlaps riparian management areas and to date little harvesting has occurred in any of the zones.

To model the plan in the analysis, all four kinds of zones were excluded from the timber harvesting land base, resulting, as noted earlier in '*land base exclusions*', in the identification of a total of 701 affected hectares, and necessitating a reduction to the timber harvesting land base of 374 hectares, after accounting for overlaps with other objectives.

Modifications in 2007 to the 2002 management strategy include minor additions to protected areas totalling less than 50 hectares for eagle habitat. All of these lie within one of the Squamish Nation's Wild Spirit Places, the overall implications of which I have considered below, under '*Other information – Wild Spirit Places – harvest level partition*'.

The Over-wintering Bald Eagle Habitat Management Strategy, being implemented operationally, can reasonably be viewed as current practice. I am satisfied that the modelling has adequately represented the management modifications under the strategy, and that the base case analysis is reliable in this respect.

- Moose Winter Range Wildlife Management Zone

The current Moose Winter Range Management Zone (MWRMZ) established as an Ungulate Winter Range plan in July 2005, includes most of the Elaho River floodplain that extends south from the junction of Chadwick Creek and the Elaho River to the junction of Ponor Creek and the Elaho River. This zone is slightly modified from the 1989 version in which Interfor had identified a mosaic of areas of mature and old seral forest stands, distributed throughout the MWRMZ, as having very high winter forage values or good snow interception properties. These areas, which include or are close to stands of 'good' forage value, are being protected as Core Moose Winter Range (CMWR), subsequent to which harvesting is not permitted. In the analysis a total associated area of 312 hectares necessitated a reduction to the timber harvesting land base of 250 hectares, net of overlaps with other objectives.

The moose management strategy also calls for maintaining 150 hectares within the timber harvesting land base in high forage production status. I am advised by district staff that maintaining an area of this size on the timber harvesting land base for this purpose can be accommodated under ongoing operational planning. Therefore, and since the land base exclusions were based on the best available information, I am satisfied that the base case projection accounts adequately for management considerations for Moose Winter Range.

- Mountain Goat Wildlife Management Zone

In areas of mountain goat habitat in TFL 38, all forest management and harvesting activities are to be planned and implemented with the objectives of maintaining the value

of Mountain Goat Winter Ranges (MGWR) and minimizing potential impacts on the animals.

At the time the analysis was completed, a plan incorporating two strategies was being implemented to address this objective. The first, Strategy A, was for MGWRs that contain limited amounts of productive forest, all of which is considered critical habitat for the winter survival of the goats. In such areas, no harvesting is permitted. The second strategy, Strategy B, was for MGWRs comprised of critical winter habitat with productive forest between the core areas, which provides thermal cover and forage for the wintering goats. Here modified management with some level of harvest was permitted, as long as restrictions on timing, and guidelines for road construction, were adhered to. In these areas:

- no harvesting activities were permitted within core habitat area;
- 50 percent of the productive forest within the winter forage portions were retained in age class 5 or greater (i.e. over 80 years);
- within the winter forage areas, green-up for goat habitat was defined as age 40 years or greater.

In the analysis, areas defined as critical winter habitat (in both strategy classes, A and B) were completely excluded from the timber harvesting land base, while the balance of the winter forage areas in habitat class B (comprising 176 hectares of timber harvesting land base on which modified management occurs) was not excluded. From the total of 11 838 hectares so identified, 3742 hectares were in productive forest, requiring a net reduction of 1380 hectares to the timber harvesting land base after accounting for overlaps.

Since the analysis was completed strategies A and B were replaced with a new strategy whereby areas are either excluded from the timber harvesting land base or no longer considered to be goat habitat. The new TFL 38 Mountain Goat Winter Ranges were submitted to MoE for approval as Ungulate Winter Range under the GAR 9(1). Some of the old MGWRs that were excluded from the timber harvesting land base are now assumed to contribute to timber harvesting and some of the strategy B areas are either no longer considered to be MGWR or are now excluded from timber harvesting. By the licensee's estimate the net change in area where no harvesting is to take place has increased by approximately 100 hectares. This indicates an overestimation in the timber supply projected in the base case which I have included in the accounting in '*Summary of wildlife habitat areas*' and discussed further in '*Reasons for Decision*'.

- *Deer habitat*

While the 2002 timber supply analysis made no specific provision for deer habitat requirements, in late 2006, the '*TFL 38 Deer Winter Range Plan*' was submitted to MoE for approval as an Ungulate Winter Range under the GAR 9(1). The plan identifies a total of 1242 hectares of deer winter range. Of this, 1082 hectares are 'Rotation' winter range which is available for harvest over the long term and constrained only by temporal cover requirements. A total of 160 hectares of 'Retention' deer winter range are unavailable for harvest. Since the plan had been anticipated for a considerable time, it

was possible to locate selected draft Old Growth Management Areas to overlap known areas of deer habitat, to minimise additional alterations to the timber harvesting land base, and in the 2002 analysis, approximately half the ‘Retention’ range area was already excluded from the timber harvesting land base in draft OGMAs.

I am advised that due to the incorporated overlaps, only a small area of the timber harvesting land base that will be affected by deer habitat is not already accounted for by OGMAs and other land base exclusions already incorporated in the base. I have accounted for a small consequent overestimation in the timber supply as noted below in ‘*Summary of Wildlife Habitat Areas*’ and in ‘Reasons for Decision’.

- *Spotted Owl*

The Northern Spotted Owl is found exclusively within the temperate coniferous forests of western North America, with its entire Canadian distribution limited to southwestern BC. In 1986, the spotted owl was designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as ‘endangered’; i.e. the owl is ‘threatened with imminent extirpation throughout all or a significant portion of its Canadian range’.

An extensive planning process for the management of spotted owl habitat was conducted jointly by the MoFR and MoE, which culminated in the release of the Cabinet-approved Northern Spotted Owl Management Plan (SOMP) in May 1997. The SOMP includes permanent protection of potentially suitable owl habitat in existing and new protected areas, as well as Special Resource Management Zones (SRMZs) that are intended to allow for constrained timber harvesting in order to meet owl habitat objectives.

Although Spotted Owls are not known to exist within TFL 38 at this time, a small part—roughly 100 hectares—of SRMZ 21(c) does overlap part of TFL 38. All of the affected area lies in a Squamish Nation Wild Spirit Places and is included in First Nations conservancy considerations under the Sea-to-Sky LRMP currently under review by the provincial Cabinet. While any outstanding associated implications for the timber harvesting land base are therefore likely to be small, I am aware that planning work on the now combined federal-provincial recovery strategy for Spotted Owls is progressing from Chilliwack toward Squamish, with the intention of refining the boundaries of affected areas; I have accounted for this in the following way.

In completing this AAC determination prior to Cabinet’s decision on the LRMP and prior to completion of Spotted Owl Recovery planning work in this area, to avoid increasing the impacts of harvesting in any portion of the TSA that may come under additional constraint, I have considered the implications of the Wild Spirit Places for timber supply separately, under ‘Other information – *Wild Spirit Places – harvest level partition*’. In that section I have specified a volume attributable to harvesting in the Wild Spirit Places areas. In determining the AAC for TFL 38 and in attributing an appropriate partitioned volume for the Wild Spirit Places areas, I have been mindful of a potential risk of additional constraint from the presence of the yet-to-be-refined SRMZ, as discussed in ‘Reasons for Decision’.

- Marbled Murrelet

The 2002 analysis included no accounting for the management of habitat for the Marbled Murrelet. In late 2006, the Northwest Squamish Forestry Limited Partnership submitted a proposed Marbled Murrelet Wildlife Habitat Area to MoE for approval under the GAR 9(1). The total proposed WHA area for this purpose in TFL 38 comprises 440 hectares, much of which overlaps draft Old Growth Management Areas and inoperable areas. Analysts estimate that, with MoE's planning process now essentially complete, something less than 100 of these hectares are not already otherwise constrained to meet objectives for other forest values. This represents a small overestimation of the timber harvesting land base in the base case which I have noted in the following section and have accounted for in my determination as discussed in 'Reasons for Decision'.

- Summary of Wildlife Habitat Areas

Although the areas that are managed to provide wildlife habitat in TFL 38 appear to cover a very large area in combination, in practice many habitat areas are located in inoperable areas, within riparian areas, in draft OGMAs, or in areas already constrained from harvesting for other reasons. This reduces the total extent of the habitat area that must be excluded from the timber harvesting land base. In addition, in many cases the same hectares can be used to provide habitat for multiple purposes, where compatible objectives allow for overlap.

While the MoE has done much work with MoFR and the licensee to optimize the efficiency of allocating and locating the many kinds of habitats required in the TFL, District staff feel that more work is needed to further optimize this process to reconcile all the various programs and processes in the forest district, including the Soo TSA as well as the TFL. To ensure optimal results, the efficiencies gained by overlapping multiple objectives need to be continually monitored, as district staff believe the one-percent cap envisioned under the identified wildlife process is currently exceeded in the district. In the next Management Plan, MP No. 9, I therefore hope to see evidence of the intent to continue working with appropriate agencies to ensure the provision of adequate habitat as well as timber supply. The licensee and MoFR district staff may wish to contact MoFR regional staff in respect of related monitoring work already underway.

For the current determination I note that the licensee has estimated the total impact on the timber harvesting land base from habitat considerations not previously accounted for at approximately 300 hectares, or about one percent of the timber harvesting land base. Since the Northwest Squamish Forestry Limited Partnership is proposing to manage for these species according to the noted plans and strategies, I have assumed that these will represent current management, in respect of which I have remained mindful of the small associated overestimation in the base case timber supply projection, as discussed in 'Reasons for Decision'.

- Recreation Management Zone

The Sea-to-Sky LRMP area in which TFL 38 lies is one of the most heavily used recreation areas in the province, with about two million user days and a variety of water- and land-based activities. An exceptional blend of natural resources, protected areas,

services and proximity to a large regional market are expected to increase the demand and need for recreation lands in the future.

For TFL 38, a Recreation Features Inventory at a scale of 1:50 000 was completed in November 2001 by Recreation Resource Consultants Ltd., and was approved by MoFR staff. The inventory identifies areas of high, medium and low sensitivity, and areas of very high, high, medium and low significance. Areas of high and very high significance were 100-percent excluded from the timber harvesting land base if they are also of high sensitivity, and 50-percent excluded if of medium sensitivity. Areas of medium significance were 50-percent excluded if they were of high sensitivity. All lower combinations of sensitivity and significance were not excluded.

These procedures were developed by MoFR staff in consultation with recreation specialists, and are generally accepted for strategic analysis by the MoFR's Forest Analysis and Inventory Branch, although I am advised that, in operational practice, recreation features and polygons are assessed individually and are managed in a variety of ways that include harvesting exclusions, the application of forest cover constraints, and the planning and timing of patterns of harvest. The procedures applied in strategic analysis are assumed to reflect operational practice.

In the analysis, only the exclusions were represented, whereby a total identified recreation land base of 49 036 hectares required a net reduction of 722 hectares to the timber harvesting land base after accounting for overlapping objectives, as I noted earlier, under '*land base exclusions*'.

Since I am advised by district staff that, to date, activities other than exclusions of harvest have been successfully managed on the ground without constraining harvest activities, I conclude that the best available information has been used to incorporate recreation features in the analysis, and that recreation features are appropriately modelled in the base case. Given the proximity of this TFL to the large and growing urban population of Vancouver, this inventory contributes an important upgrade in the definition of current management practice for the TFL.

- Landscape-level biodiversity

Conserving landscape-level biodiversity involves maintaining forests with a variety of patch sizes, seral stages, and forest-stand attributes and structures, across a variety of ecosystems and landscapes. Together with other forest management provisions that provide for a diversity of forest stand conditions, the retention of old forest is a key landscape-level consideration. Old forest retention can be achieved through the location of OGMA's.

- Old-Growth Management Areas (OGMA's)

The establishment of OGMA's, generally through landscape unit planning, provides a means to conserve spatially distributed old forest to meet landscape-level biodiversity objectives. Through the landscape unit planning process, as described in the *Landscape Unit Planning Guide*, OGMA's are identified, wherever possible, in forests that are already unavailable for timber harvesting for other environmental reasons (such as moose or mountain goat winter range, for example) or for economic reasons such as physical

inoperability. Old forest retention requirements are only met by establishing new reserves in the timber harvesting land base where these requirements are not met in areas already excluded from the timber harvesting land base for other reasons. Where this is done, areas with high biological value should be identified. In general, where possible, reserves of productive forest for land-base exclusions are established for overlapping values, which helps to optimize their contribution to the non-timber values they are designed to protect, while also reducing impacts on timber supply.

For TFL 38, Squamish Forest District staff have completed draft landscape unit (LU) boundaries and established Biodiversity Emphasis Options (BEO). Within the forest district there are 20 LUs, but within TFL 38 there are just 2 LUs, the Elaho, with an intermediate BEO, and the Upper Squamish, with a low BEO.

The identification and selection of draft Old Growth Management Areas were based on the suitability of particular areas for providing representative old-growth characteristics to meet specified ecological objectives, and for providing a variety of habitat for Identified Wildlife and other species. The OGMA locations were selected by the licensee in co-operation with staff from the former Ministry of Sustainable Resource Management (MSRM), the former Ministry of Water, Land and Air Protection (MWLAP), and MoFR. The timber supply analysis provides details of the draft OGMAs in both the Elaho and Upper Squamish Landscape Units, which total 6969 hectares, of which 6168 hectares are in productive forest, and which required a reduction of 1140 hectares to the timber harvesting land base for the base case, as I noted earlier in *'land base exclusions'*.

Because the Old Growth Management Areas were in draft form at the time of the analysis—and remain so—the licensee also applied forest cover requirements in the analysis in accordance with the direction provided in the landscape unit planning guide, to ensure that the base case reflects the entire potential requirement for landscape-level biodiversity.

Since the OGMA locations were selected by the licensee in collaboration with the three ministries with relevant jurisdiction, I conclude that the draft OGMA locations are appropriate for the purposes of this determination and that their implications for timber supply have been adequately represented in the land base exclusions applied in deriving the timber harvesting land base for the base case analysis. I am satisfied that these exclusions, in conjunction with the forest cover requirements applied for landscape-level biodiversity, are consistent with the procedures documented in the *Landscape Unit Planning Guide* and provide an adequate accounting for landscape-level biodiversity requirements in the base case. I understand that the licensee has acknowledged that OGMAs will need to be reviewed with each MP, since natural disturbances, including wind, may alter the structure of forest stands.

I note that the draft landscape units in the TFL have not yet been approved by the designated environment official. However, unless the current draft landscape units are altered significantly, which seems unlikely at this stage with much of the planning complete and already reviewed, the draft landscape units provide an adequate basis for incorporating the planning objectives at this level into the timber supply forecast.

- *Stand-level biodiversity: wildlife tree patch retention*

Wildlife tree patches (WTPs) and coarse woody debris are important to the conservation of biodiversity at the forest stand level. The Code and FRPA both provide for the retention of wildlife trees in harvested areas.

The licensee indicates that, since wildlife tree patches began being retained on TFL 38 in 1996, the target retention level has been 10 percent of each cutblock. However, harvesting began in the TFL in 1962, and in 2001, 31 percent of the timber harvesting land base area was occupied by stands aged between 5 and 40 years, which are assumed to have been harvested without wildlife tree retention (WTR).

The TFL comprises two draft landscape units with 11 BEC subzones. In the analysis, the WTR requirements were calculated in accordance with Section 3.1 of the *Landscape Unit Planning Guide* (March 2000), accounting for the area harvested, the BEC subzone, and the BEO emphasis, for each landscape unit. In the analysis, on the assumption that 50 percent of the resulting total wildlife tree retention requirement of 6 percent will be met outside the timber harvesting land base, a reduction of 3 percent was applied to the volume harvested per hectare.

The licensee practices variable retention on TFL 38 and has found that due to the spatial constraints inherent in the definition and intent of variable retention, some retention patches must be located in operable and merchantable timber that is not otherwise constrained for other resources such as in riparian areas, visually sensitive areas or wildlife habitat. In the licensee's experience, wildlife tree retention can be implemented successfully to meet variable retention objectives, and the licensee estimates that the additional impact of variable retention harvesting is equivalent to an increase of five percentage points in the wildlife tree retention target. Consequently, the total amount of WTR assumed in the analysis was 8 percent of the timber harvesting land base, represented in the model in the form of an equivalent volume reduction applied to yield curves.

In considering the contribution of WTPs toward meeting biodiversity objectives, I note that the amount of retention required was appropriately calculated from the *Landscape Unit Planning Guide*. I further note that while in practice the WTPs and the trees left in variable retention areas may well contribute to mature or old-seral targets, no such benefit was accounted for in the analysis, since the WTR was modelled in the form of a volume reduction. From this it would appear that, overall, current practice in this respect meets or exceeds the guidebook requirements, and I am satisfied that this has been adequately accounted for in the base case analysis.

- *Summary of biodiversity considerations*

I have considered and reviewed the characteristics of the two recommended landscape units within TFL 38, the Elaho and the Upper Squamish, including the BEC zones, subzones and variants, and the natural disturbance types present. I have noted that the Elaho LU has been assigned an intermediate biodiversity emphasis, and the Upper Squamish a low biodiversity emphasis. I have noted that in the analysis, OMGAs appropriately contribute to achieving old-seral stage retention requirements, with

non-timber harvesting land base areas and recruitment of younger areas on the timber harvesting land base appropriately assumed to achieve the remaining areas needed for the seral requirements. I note also that the forest cover requirements used to model landscape-level biodiversity requirements are based on the *Landscape Unit Planning Guide* (March 2000). From my review and from discussions with MoFR staff and analysts, I am satisfied that biodiversity considerations have been represented by appropriate procedures in the base case analysis.

- *Cultural heritage values*

Both the Squamish (Skwxwumish7ulh) First Nation and the Lil'Wat First Nation (Mount Currie Band) have asserted traditional territories within TFL 38. In 2006, the Squamish Nation purchased TFL 38 from Interfor and established the Northwest Squamish Forestry Limited Partnership as the licence holder.

For protection of cultural values, the Squamish Nation has identified five Wild Spirit Places (Wild Spirit Places, as noted in 'Guiding Principles' and discussed in 'Other Information – *Wild Spirit Places – harvest level partition*'), three of which lie within TFL 38, and has also identified eight other cultural sites of varying sizes, mostly over 50 hectares and including sections of the timber harvesting land base, which it wishes to see protected.

The Lil'wat Nation has released its version of a land-use plan that includes the overlap of its territory with the TFL. Although there are some differences between the Lil'wat plan and that of the Squamish Nation, there are also significant similarities. For example, both plans propose the protection of the Upper Elaho River and both plans have assumed that forest harvesting activity can occur in the lower Elaho and Upper Squamish drainages.

An Archaeological Overview Assessment (AOA) has been prepared for the Squamish Forest District, including TFL 38, to show where the potential exists to find culturally modified trees (CMTs) and historic sites or sites of historic use, based on the locations of rivers and particular slopes or vegetation species. I have reviewed this AOA map, the '*Squamish Forest District Map of Archaeological Potential*', which is in use as a general management tool in decisions on where to employ archaeologists to carry out Archaeological Impact Assessments, which then guide operations on the ground. Two rock-shelters and habitation areas have already been confirmed. For the eight noted culturally significant sites, draft management direction under the LRMP has been to prohibit logging and some of these sites may eventually become fully reserved; in this case they will not be able to be accommodated through flexibility in operational planning alone.

In reviewing this information, the fact that the Squamish Nation now holds this tenure has reduced some of the operational uncertainties in the TFL, particularly in respect of accommodating cultural heritage values in daily operations. The ongoing avoidance of harvesting in the Wild Spirit Places, however, pending Cabinet's approval of applicable management regimes under the Sea-to-Sky LRMP, has prompted me to consider and resolve the associated implications for timber supply separately, through the partitioning

of a harvest level specifically attributable to the these areas, as discussed two sections below.

I am mindful of the eight culturally significant sites the Squamish Nation wishes to protect and that harvesting may be avoided in these areas, perhaps indefinitely. This indicates a potential risk of an overestimation of the timber supply in the base case to an extent that appears currently unquantifiable. I have accounted for this risk in ‘Reasons for Decision’.

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

Other information

- First Nations Consultation

As noted in ‘*cultural heritage values*’, both the Squamish First Nation and the Lil’Wat First Nation have asserted traditional territories within TFL 38. Both the Mount Currie Band and the Squamish First Nation have signed Forest and Range Agreements (FRAs) or Opportunities (FROs). The Mount Currie Band FRA does not include any timber volume commitment from areas within TFL 38. The Squamish Nation, however, has volume commitments in two agreements—one being a one-year FRA, signed in 2005, with a volume commitment of 98 800 cubic metres over a five-year period, and one a five-year FRA signed in 2006 with an additional volume commitment of 98 800 cubic metres per year to be found in TFL 38.

For the AAC determination for TFL 38, the standard consultation process was followed whereby the MoFR sent an initiation letter to each First Nation, which was followed by a 60-day consultation period commencing on January 18, 2007. No related correspondence was received from either First Nation by the close of the consultation period.

- Wild Spirit Places – harvest level partition

In 2001, the Squamish First Nation released a land use plan known as ‘Xay Temixw’ or ‘Sacred Land’, covering its asserted traditional territory. The Xay Temixw plan includes five ‘Wild Spirit Places’ or ‘WSPs’ which are highly valued for cultural and spiritual values, and three of which are located within TFL 38. Under Xay Temixw, the Squamish Nation plans to limit or exclude timber harvesting in the Wild Spirit Places which are included in the area covered by the Sea-to-Sky Land and Resource Management Plan currently under consideration by the provincial Cabinet. Consistent with Cabinet’s interim measures for the LRMP, both Interfor and the Northwest Squamish Forestry Limited Partnership have avoided harvesting in the Wild Spirit Places in TFL 38 since the release of Xay Temixw, in order not to limit the options currently under consideration by Cabinet. Until the LRMP is approved, and the status and management of each of the WSP areas is confirmed, the eventual extent of any associated timber supply implications cannot be known. However, it is understood that the total affected area will not be larger than that shown in the Xay Temixw plan.

For five years, forest management inside the Wild Spirit Places—i.e. no harvesting—has been different from that outside the Wild Spirit Places, and may reasonably be expected

to continue as such while government-to-government negotiation on the LRMP proceeds and is presented to Cabinet for decision. It is inappropriate for me to speculate on the final land status and kind of management that will be approved for these areas by Cabinet under the LRMP. However, the maximum potential impact to timber supply could be complete prohibition of harvesting in all three WSPs located in this TFL. In this substantial range of uncertainty, in determining an AAC for the TFL as a whole, I have considered it appropriate to specify a partitioned volume attributable to harvesting only in the Wild Spirit Places. I have done this to reduce the risk to timber supply sustainability and the potential conflict among integrated management objectives that might otherwise arise from having the TFL's entire AAC taken from the non-WSP land base.

In determining an appropriate harvest level for the Wild Spirit Places areas in TFL 38, my primary concern has been that whatever harvest level is determined as obtainable from areas outside the WSP areas must be sustainable indefinitely. From this primary concern I have reasoned as follows.

In 2003, Interfor performed a sensitivity analysis to estimate the maximum even-flow contribution to the timber supply of TFL 38 made by the forests outside the Wild Spirit Places. This was done by excluding from the timber harvesting land base the maximum WSP area in the Xay Temixw plan under consideration by the LRMP, and estimating the maximum even-flow harvest sustainable on the remaining land base of TFL 38. The objective of the sensitivity analysis was to identify the upper limit of the potential timber supply impact of management changes in WSP areas without speculating on any future decision by Cabinet as to what those changes might be.

While the data inputs and assumptions for the 2003 sensitivity analysis differ slightly in some respects from those in the current analysis, I am advised by analysts that the differences are small enough to permit a reliable estimation of the sustainable contribution to timber supply from the TFL area outside the three Wild Spirit Places. I have reviewed the classification of the land base of the TFL before and after the 'removal' of the entire area associated with the three WSPs, and I note in particular that the removal of this land base in the sensitivity analysis reduced the total area of TFL 38 by 22 percent, the productive forest by 27 percent, and the timber harvesting land base by 24 percent.

In the timber supply analysis, in addition to the base case projection in which the initial harvest level was set at the current AAC of 250 500 cubic metres, an even-flow alternative was provided (discussed below in 'Alternative Harvest Flows') in which, in order to maintain the maximum possible non-declining even-flow harvest from the whole TFL over the entire forecast period, the initial harvest level was set at the long-term level of 217 500 cubic metres. In the Wild Spirit Places sensitivity analysis, with all of the land base associated with the WSPs removed, the maximum, non-declining, even-flow harvest level achievable in the rest of the TFL was reduced by 46 500 cubic metres to 171 000 cubic metres. This represents a 21.4-percent reduction, brought about by the timber harvesting land base reduction of 24 percent, indicating that the forest productivity in the Wild Spirit Places is slightly less (89.2 percent) than the average for the timber harvesting land base in the TFL as a whole.

Having determined that the non-declining, even-flow harvest sustainable from the non-WSP area of the TFL is 171 000 cubic metres per year, it is apparent that the appropriate corresponding harvest level attributable to the WSP areas during the next five years will be the difference between the total AAC that I determine for the overall management unit and the 171 000 cubic metres per year harvest level for the non-WSP area. I will provide specific values for the overall AAC and the Wild Spirit Places partition in my 'Reasons for Decision'.

- Twenty-year plan

The licensee provided a 20-Year Spatial Feasibility analysis to indicate that the short-term harvest, as projected for the first 20 years, can be located on the landscape with all of the base case assumptions and cutblock adjacency in place. The analysis was not designed to be an operational plan, but a test of timber availability given the current structural characteristics and spatial distribution of components of the resource, as well as the structural and spatial management objectives associated with the Forest Practices Code (now in transition to FRPA). The plan sets out a hypothetical sequence of harvesting over a period of 20 years and utilizes spatial constraints, to test the achievement of a harvest level that conforms to current standards and practices as defined for the base case in the Timber Supply Analysis Information Package (October 2002, Final Version).

In accepting the plan in a letter dated June 23, 2003, the district manager noted that the review indicated the presence in the TFL of sufficient unconstrained areas to accommodate any additional area required to meet the 20-year plan without compromising current forest management requirements, noting that 'even when marginal stands were excluded, less than 50 percent of the remaining operable, mature timber has been identified for harvest in the 20 year plan'.

As noted earlier in 'Timber Supply Analysis', the 20-Year Spatial Feasibility analysis was applied as a non-declining, even-flow projection of 217 500 cubic metres, not as the current base case with its proposed AAC of 250 500 cubic metres. It was also based on the entire TFL land base including the WSP areas in which harvesting is now being avoided pending Cabinet's approval of the LRMP.

Since the 20-year plan was submitted, five years of harvesting have taken place, albeit at substantially less than the AAC. The plan's application in showing that the base case forecast can be met as projected in each of the first four five-year periods from the land base outside the Wild Spirit Places from now on would thus appear to require some interpretation.

However, I also note that the licensee used the CASH 6 model to perform the analysis and that this model includes the capability for spatially explicit modelling. I understand that this functionality was applied for the first 20 years of the base case forecast period, confirming the spatial availability of cutblocks to meet the first 20 years of harvest as projected in the base case (personal communication with the Timberline analyst February, 2007). I am therefore satisfied that the base case projection is adequately supported by spatial analysis over the first 20 years.

- Management Plan No. 9

Former TFL licensee Interfor was scheduled to submit MP No. 9 for approval in 2003, but did not do so owing to overriding uncertainties associated with factors including the Sea-to-Sky LRMP process, ongoing negotiations with First Nations, the size and locations of Wild Spirit Places, and other factors.

Since no draft MP No 9 has been submitted, no new plan has been available to subject to public review or consultation with First Nations. Rather, the (former) licensee has applied for and has been granted yearly extensions to MP No. 8. In December, 2006, the current licensee requested another extension, and the MoFR initiated related First Nations consultation on January 17, 2007, with a defined review period of 60 days.

In ‘Implementation’ below, I have instructed the licensee to study the Sea-to-Sky LRMP decision upon its release by the provincial Cabinet, to make interpretations with respect to practices both inside and outside the Wild Spirit Places, to determine the implications for timber supply, to submit for my review no later than six months after the public release of the LRMP decision a timetable indicating the progression of steps leading to the updating of the analysis and the Management Plan, and to submit a new Management Plan and a new timber supply analysis within two-and-a-half years of the release of the land use decision.

- Outstanding planning issues

As noted in ‘Guiding Principles’, ‘*Wild Spirit Places—harvest level partition*’ and ‘Management Plan No 9’, the Sea to Sky LRMP is currently under review by the provincial Cabinet for approval, and timber supply implications could arise from protection of the Wild Spirit Places and other culturally significant sites (noted under cultural heritage values above). A government announcement on the LRMP is expected in the coming months. In accordance with my ‘Guiding Principles’ I will not speculate on any associated implications for timber supply. However, depending on the outcome of the LRMP with respect to changes in land use and management, as I have noted in ‘Determination’ below, I fully expect to revisit this AAC earlier than the statutorily required period, to which end I have issued the instruction in the previous section ‘Management Plan No 9’, reiterated in ‘Implementation below’, to prepare a new analysis and Management Plan in an appropriately timely fashion.

The draft landscape units in the TFL have not yet been approved by the designated environment official. However, unless the current draft landscape units are altered significantly, which seems unlikely at this stage with much of the planning complete and already reviewed, the draft landscape units provide an adequate basis for incorporating the planning objectives at this level into the timber supply forecast.

- Harvest sequencing

In timber supply analysis, the order in which eligible stands are assumed to be harvested can affect the projected timber supply in a number of ways. Any difference between the modelling assumptions made and the order in which stands are actually harvested in operational practice must be examined and accounted for.

In the base case analysis for TFL 38, it was assumed that the oldest stands would be harvested first, based on their eligibility within a given zone and subject to the applied forest cover constraints. While no harvest sequencing assumption completely emulates actual harvest performance, the assumption used in the base case represents a reasonable approach to operational management in a TFL with the age-class structure of TFL 38, in which for the first 60 years (subject to forest cover constraints) most of the harvest will come from existing mature forest, in order to capture the higher volumes in the mature forest first. I therefore accept the assumption used in the base case as appropriate for the purposes of this determination.

- Actual harvest level

During the recent several-year period of uncertainty in the land base with respect to Wild Spirit Places, and during depressed market conditions for Hemlock and Balsam, the full volume of 250 500 cubic metres available each year under the licence has not been harvested. Harvesting records indicate that from 2002 to 2006, the licensee harvested an average of about 140 000 cubic metres per year of the 206 000 cubic metre average AAC available to the licensee (i.e. net of AAC allocated to BCTS and the Squamish First Nation in its FRA) over that period. No harvesting at all was conducted in WSP areas.

This has resulted in an accumulated ‘undercut’ by the licensee of just over 325 000 cubic metres. I agree with district staff that under currently foreseeable conditions, this accumulated unharvested volume is less likely to become harvested by an increase in rates of cut, and more likely to remain on the landscape in support of harvests in the coming years. While the continued availability of the undercut volume for this purpose is not a guaranteed condition, its current presence does add a degree of ‘back-up’ stability in the timber supply supporting the harvest forecast in the first decade or so, and I have discussed this further in ‘Reasons for Decision’.

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

Alternative Harvest Flows

The nature of the transition from harvesting old growth to harvesting second growth is a major consideration in determining AACs in many parts of the province. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be regularly determined to ensure that short-term harvest levels are compatible with a smooth transition to medium- and long-term levels. Timber supplies need to remain sufficiently stable so that there are no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

In the base case chosen for reference in this determination, harvest flow objectives included: (1) maintaining an initial harvest level that achieves the current AAC to provide for short-term timber supply requirements until reductions become necessary for long-term sustainability; (2) (with the exception of the first decade) limiting any

reductions in harvest level to 10 percent of the level prior to the change; (3) achieving a non-declining, sustainable, long-term harvest level over a 250-year period with a non-declining growing stock; and (4) prohibiting the harvest level from falling at any point below the long-term harvest level.

In addition to the base case chosen as discussed earlier in ‘Timber supply analysis’, the licensee examined five alternative harvest flows with the following objectives:

- (A) maintain non-declining harvest level for the entire 250-year forecast;
- (B) maintain an initial harvest level of 250 500 cubic metres per year for two decades;
- (C) maintain an initial harvest level of 250 500 cubic metres per year for three decades;
- (D) maintain an initial harvest level of 250 500 cubic metres per year for four decades;
- (E) maintain an initial harvest level of 250 500 cubic meters per year for one decade.

Alternative (F) was the base case discussed earlier and used as a reference in the considerations documented throughout this rationale statement.

In each of the cases (A) to (E), the initial harvest level could be maintained as described in the desired harvest flow, but also in each case this resulted in the projected mid-term harvest level falling to various extents below the long-term level.

In reviewing all of the alternative harvest flows, I am satisfied that, overall, the harvest flow objectives established for the base case chosen and used as the primary reference for my considerations in this determination are the most consistent with the socio-economic objectives of government as expressed by the minister in his letter of July 4, 2006. This letter is discussed in the section below with particular reference to my consideration of ‘the importance of a stable timber supply in maintaining a competitive and sustainable forest industry, while being mindful of other forest values’.

I have also relied in this determination on alternative harvest flow (E) and on related further work by the MoFR analyst. Flow (E) indicates adequate flexibility in the growing stock in the TFL to extend the initial harvest level of 250 500 cubic metres for ten years from 2002, followed by thirty years at 225 450 cubic metres, followed by a small dip for thirty years just below the base case long-term level of 217 500 cubic metres, rising to that long-term level at year 71. The MoFR analyst has shown that if the harvest flow maintains the proposed level of 250 500 cubic metres for ten years, but avoids the intermediate step of 225 450 cubic metres by reaching the long-term level of 217 500 cubic metres after ten years, the growing stock in the TFL is sufficiently flexible to permit the small ‘mid-term dip’ to be essentially eliminated.

I have taken this conclusion into account in my determination, as discussed in ‘Reasons for Decision’.

- Community dependence on forest industry

In its Management Plan No. 8, the previous licensee Interfor identified 971 direct and indirect jobs supported by TFL 38.

The current socio-economic context of TFL 38 is helpfully reviewed by reference to information for the general surrounding area covered by the Sea-to-Sky LRMP, which supports approximately 34 000 residents. In the LRMP area in 2001, the forest industry accounted for 10 percent of the employment (1,608 jobs) and 12 percent of the income (\$73.7 million). This area is unusual in BC in that the forest sector represents a relatively small proportion of the local economy in comparison with tourism which is the largest single sector in the economy of the LRMP area, supporting 43 percent of all jobs. Forestry does comprise a significant portion of the economy in Squamish and rural areas, but contributes only in lower proportions in Pemberton, Whistler, and Lions Bay.

Two nearby major mills have recently closed permanently—Interfor’s Squamish sawmill, in 2004, and Doman-Western’s Woodfibre pulp mill, in 2006. Some small mills remain in Brackendale, Mt. Currie, Whistler and Pemberton. Almost all of the timber harvested in the LRMP area is processed outside the area, mainly on the south coast.

Notably, timber harvests in the LRMP area as well as in TFL 38 have been below the AAC in recent years. Contributing factors include low timber and pulp prices, high production costs, changes in forestry legislation and policy, company-specific issues, and social / land base issues.

In 2001, the mining sector accounted for 97 direct and 69 indirect (supply and service) jobs, about one percent of the employment in the LRMP area, and a very small agriculture economy provided 175 person years of employment.

From this information it is clear that while forestry currently plays a somewhat reduced role, it is still an important component of the local economy.

- (c) **the nature, production capabilities and timber requirements of established and proposed timber processing facilities;**

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

- (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;**

Minister’s letter

The Minister has expressed the economic and social objectives of the Crown for the province in a letter dated July 4, 2006 to the chief forester (attached as Appendix 3). This letter replaces the July 28, 1994 letter and the February 26, 1996 memorandum to the chief forester regarding economic and social objectives.

The July 4, 2006 letter stresses the importance of a stable timber supply while being mindful of other forest values. The letter also notes that the coast of BC is experiencing a period of significant change and transition, and urges that the nature of timber supply that can maintain a competitive and sustainable forest industry, while reflecting decisions made in land and resource management plans, be considered in AAC determinations. In that regard, I believe the harvest flow objectives assumed in the base case will help to provide a relatively stable transition from the short-term harvest levels to the lower, even-flow, long-term harvest level.

As I have noted in ‘Timber Supply Analysis’ and ‘Alternative harvest flows’ the principles of stability are incorporated in the harvest flow objectives assumed in the base case projection which I have considered extensively in this determination and, as I have noted in ‘Reasons for Decision,’ the AAC I have determined both takes into account the need for stability in the long-term timber supply, and accommodates objectives for all forest resources.

The letter also refers to local objectives, which are considered in the following section.

Local objectives

The Minister’s letter of July 4, 2006 suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government’s broader objectives as well as any relevant information received from First Nations.

No information was forthcoming from the First Nations consultation. Local objectives will be made clear for the area including TFL 38 when the Sea-to-Sky LRMP is approved by Cabinet, at which time further consideration may need to be given to some aspects of the timber supply projection, in order to determine the ongoing feasibility of the base case in respect of any significant changes in land use or management.

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

I have reviewed the information regarding unsalvaged losses and am satisfied that the assumptions made and documented in the analysis in accounting for this factor represent the best available information and are appropriate for use in support of this determination.

Reasons for Decision

In reaching my AAC determination for TFL 38, I have made all of the considerations documented above, and have reasoned from them as follows.

The current AAC determination for TFL 38 is more than three years overdue for reasons including overriding uncertainties related to government-to-government negotiations which are now progressing toward a conclusion. However, government’s Sea-to-Sky LRMP announcement is still pending at this time, including the associated matters of future land status, boundaries and management regimes applicable to the Wild Spirit Places. Therefore, to be consistent with my Guiding Principles, I will not speculate on government’s eventual LRMP decision and how it will be interpreted and implemented on the ground. Consequently, this determination is based on current land use and current forest management practices.

The licensee has proposed that, based on information first submitted in 2003, the existing AAC of 250 500 cubic metres can be maintained for the next five years and that the AAC should include a specified harvest level attributable to the Wild Spirit Places as these were first defined in 2001. The licensee considers the feasibility of this to be increased by the recent accumulation of an ‘undercut’ of just over 325 000 cubic metres attributable to the AAC available to the licensee.

My own considerations are based on the TFL as a whole, taking all requisite factors into account as described throughout this document.

In my considerations I have noted the significant proportions of balsam and hemlock stands present in the TFL, which together form roughly 55 percent of the available volume. In considering associated challenges in harvesting the TFL species profile representatively, I have noted some undercutting of balsam and slight over-harvesting of cedar and Douglas-fir, though the fir harvest is in fair balance for the profile outside the Wild Spirit Places. Hemlock is also representatively harvested.

I have also noted with appreciation the extensive inventories undertaken by the previous licensee Interfor to address the many forest resource values other than timber present in the TFL and the substantial habitat areas required by the diverse, high-profile resident species. As I noted in *'Summary of Wildlife Habitat Areas'* much of the wildlife habitat area lies in non-contributing areas or overlaps with the draft OGMAs and other constrained areas. However, roughly four hundred hectares of habitat were still unaccounted for in the base case timber supply analysis, representing a relatively small overestimation of about one percent in the projected harvest level throughout the forecast period, which I will address below. Other constraints may arise from future land use decisions; while I cannot speculate on these, current information indicates that any additional requirements may be accommodated in non-contributing areas, without impact.

With respect to cultural heritage values for the Squamish and the Lil'wat First Nations in TFL 38, the situation is that the Squamish Nation wholly owns the company holding the licence for the area and has placed a high priority on recognizing its cultural interests, especially in the Wild Spirit Places and potentially in other culturally significant sites that will become clear when the land use plan is announced. For this determination, I have also reviewed and considered the information from the AOA maps used by the district to assess the probability of encountering culturally significant sites. I am further satisfied that MoFR staff followed the currently accepted procedures in the consultation process with the Lil'wat and the Squamish First Nations about this decision.

As I noted in *'Timber supply analysis'*, the final version of the licensee's timber supply analysis (revised in March, 2004 and corrected in December 2004) shows a base case harvest forecast in which the initial harvest rate is 250 500 cubic metres per year, identical to the current AAC. This level is maintained for 5 years before dropping by 10 percent to 225 000 cubic metres. After 5 years at this level, the harvest is projected to drop again, by approximately 3.3 percent, to 217 500 cubic metres, the long-term level.

I have given my reasons in *'Alternative harvest flows'* for considering that, of the six alternative forecasts provided, this projection maintains the most consistency with the economic and social objectives of the Crown for the province as expressed by the Minister of Forests and Range. I have also indicated my awareness of the flexibility demonstrated in alternative harvest flow (E) regarding the availability of timber to meet short-term harvest levels while minimizing reductions in the mid-term.

The reference year for the base case projection was 2002, but the data were prepared in 2001. So, technically, the first stepdown from the 250 500 cubic metres to 225 500 cubic

metres would therefore be projected to occur at the beginning of 2007. However, in this determination, in addition to the base case projection I have also relied on alternative harvest flow (E) and on a variant to this flow generated through related work by the MoFR analyst. This work shows that the harvest level of 250 500 cubic metres can be continued for a total of 10 years after 2002, dropping thereafter to the stable long-term level of 217 500 cubic metres. While this future drop would appear to incur a certain economic and social risk, in fact the licensee's reduced harvest level compared to its allotment in the TFL in recent years—which over the past five years has averaged 140 000 cubic metres—has already resulted in a 325 000 cubic metre undercut. This already reduced level of economic activity significantly mitigates the potential risk of future adverse consequences that might otherwise accompany such a reduction in harvest level. I also recognize that the undercut represents timber volume that in the base case was assumed to have been harvested by now but which in fact remains on the landscape to support future harvesting.

From all of this I conclude (i) that a harvest level of 250 500 cubic metres for the TFL is both analytically achievable for the effective period of the new AAC and supported by an adequate growing stock as discussed further below, (ii) that any socio-economic adjustment arising from a future harvest level reduction is already partially mitigated, and (iii) that continuing the allowable harvest at its current level is consistent with the priority placed by the Minister on maintaining a stable timber supply.

District staff have expressed concern over the operability and economic viability of some of the hemlock and balsam stands assumed to contribute to timber supply in the analysis. I have considered this in detail, particularly in context of the historical progression of harvesting within the TFL. The development activity in the northern reaches of the TFL, in the upper Elaho area, which began as recently as 2001 and was quickly delayed to accommodate environmental and First Nations concerns, indicates that plans existed to progressively access the marginally economic northern limits of the TFL. Consequently, I have included them in the timber harvesting land base at this time, prior to the LRMP announcement. This contributes to my reassurance that the AAC of 250 500 cubic metres for the TFL as a whole is supported by an adequate profile of growing stock and is also achievable on the ground.

In view of the Squamish Nation's clear attachment to the cultural objectives of the Wild Spirit Places, I have been mindful of the need to recognize and accommodate in some way the effective 'log-around' which is ongoing in the WSPs, pending government's decision on the LRMP. I will therefore establish a 'partition' that recognizes the significant uncertainty concerning the future of timber harvesting in these areas.

Since some form of modified management, or even no harvesting at all, is likely to continue for the foreseeable future, it is necessary to avoid potential conflict among integrated management objectives that might otherwise arise from attempting to locate the whole AAC for the entire TFL in the reduced area outside the Wild Spirit Places. I have therefore assessed an appropriate level of harvest that can be expected to be sustained from areas outside the WSPs, where all the harvest in the TFL is now occurring.

Analysis has identified 171 000 cubic metres per year as a sustainable rate of harvest for the areas of the TFL outside the Wild Spirit Places, and I note that this level is relatively consistent with the licensee's recent and current average harvest performance of 140 000 cubic metres per year from the TFL plus the 42 000 cubic metre allocation to BCTS. This harvest flow was derived by aspatial analysis, but is supported and can be maintained by existing stocks of mature timber until second-growth stands, which are well developed in this TFL, become available for harvest. I note that if any difficulty is experienced in the harvest transition from mature to second-growth stands in the non-WSP areas, there is some flexibility to reduce the relatively conservative assumption for minimum harvestable age of harvesting at culmination of mean annual increment, at least for a limited period, to achieve the necessary supplemental harvest volume, without incurring any undue consequences for the long-term harvest level.

Deducting the sustainable harvest level of 171 000 cubic metres for the non-WSP areas from the AAC of 250 500 cubic metres for the TFL as a whole permits the derivation of a harvest level of 79 500 cubic metres that may be appropriately specified as attributable (i.e. 'partitioned') to the WSP areas. While I am satisfied that timber exists in the WSP areas to support this harvest, in reality it is unlikely that such a level of harvest will be pursued.

In conclusion, I have noted that after accounting for all incorporated overlaps, the total area of the timber harvesting land base that will be affected by habitat considerations not previously accounted for amounts to 300 hectares, which indicates an overestimation of about one percent in the harvest level. I have also noted an unquantifiable risk of an overestimation due to the eight identified culturally significant sites and the potential for implications from Spotted Owl. Counterbalancing these factors is the currently unquantifiable underestimation in the timber supply, as discussed in '*Coastal Log Grades*', which is introduced by the lack of accounting in the base case for dead potential volumes, which must now be taken into account. In context of all the other considerations noted throughout this rationale, in my judgment it is appropriate for the effective period of this AAC to assume that these over- and underestimations may be considered to be roughly mutually offsetting and requiring of no further specific accounting in this determination.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties in the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years and that reflects current management practices as well as the socio-economic objectives of the Crown can be best achieved on TFL 38 at this time by establishing an AAC of 250 500 cubic metres for the TFL, of which 79 500 cubic metres are specified as attributable to the Wild Spirit Places.

This determination is effective March 28, 2007, and will remain in effect until a new AAC is determined, which must take place within five years of the effective date of this determination. Depending on the outcome of the Sea-to-Sky LRMP with respect to

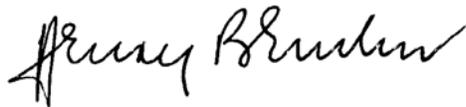
changes in land use and management, I anticipate revisiting this AAC considerably earlier than the statutorily required period.

Implementation

In the period following this decision and leading to the subsequent determination, I encourage the licensee and/or MoFR staff to undertake the tasks noted below that I have also described further in the appropriate sections of this rationale. These projects are important to help reduce the risk and uncertainty associated with key factors that affect the future timber supply in TFL 38. I therefore request that the following be completed before the next determination:

- *Land Use Decision*: Upon Cabinet's release of its decision on the Sea-to-Sky LRMP, the licensee should study the decision and make interpretations with respect to practices both inside and outside the Wild Spirit Places, to determine the implications for timber supply. Within six months after Cabinet's release of the LRMP decision, the licensee should submit for my review a timetable indicating the progression of steps leading to the updating of the analysis and the Management Plan. I expect this to lead to an approved new Management Plan and a new AAC determination within two-and-a-half years of the release of the land use decision.
- *Marginally economic stands*: In recognition of the potential risk of assuming that marginally economic stands, including balsam stands, will contribute to the timber supply to their full extent, the licensee should monitor, and report to the district manager, the ongoing extents to which these stands are utilized, to provide the information justifying their inclusion in the timber harvesting land base that will reduce uncertainty in the next timber supply analysis in preparation for the next determination.
- *Species Profile*: Notwithstanding the acknowledged implications of market pressures on the selection of species for harvest, the present undercutting of balsam and over-cutting of cedar in proportion to their respective representations in the species profile on the timber harvesting land base in the TFL could, if continued, lead to excessive harvesting pressure and a decline in particular species. The licensee should therefore monitor, and report on in the next analysis, the species profile of the harvest relative to the species profile of the area that is currently available for harvest. Meanwhile, I encourage the reconciliation of these profiles to the extent possible.
- *Site productivity estimates and pests and disease in managed second-growth stands*: I request that the licensee (a) monitor growth in natural and managed stands to confirm the site productivity estimates for TFL 38 and (b) monitor risks from pests and disease—in particular for root-rot in fir plantations—to ensure the yield projections used in future analyses appropriately reflect volumes per hectare realized on the ground.
- *Coastal log grades*: I urge that the licensee and MoFR staff work together to determine an appropriate method of tracking actual utilization of dead potential volumes so that this factor can be more fully accounted for in the next determination.

- *Non-WSP land base:* This area will continue to be the focus of future harvesting activity in the TFL, but is subject to consideration of many non-timber values. In preparation for the next management plan and timber supply review, the licensee should develop a precise accounting of the implications for timber supply from interactions of these non-timber values on the non-WSP land base, so that risks and uncertainties in the timber supply for that area can be adequately reflected in the next AAC determination.



Henry Benskin, R.P.F.
Deputy Chief Forester

March 28, 2007



Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157
Consolidated to October 21, 2004, reads as follows:

Allowable annual cut

- 8** (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for
- (a) the Crown land in each timber supply area, *excluding tree farm licence areas, community forest areas and woodlot licence areas*, and
 - (b) each tree farm licence area.
- (2) If the minister
- (a) makes an order under section 7 (b) respecting a timber supply area, or
 - (b) amends or enters into a tree farm licence to accomplish the 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 5 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 5 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 5 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 10 years after the date of the relevant last determination, and
 - (b) must give written reasons for the postponement.
- (3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection

- (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she
- (a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and
 - (b) must give written reasons for setting the earlier date.
- (4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).
- (5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to
- (a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and
 - (b) different types of timber and terrain in different parts of private land within a tree farm licence area,
 - (c) [Repealed 1999-10-1.]
- (6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.
- (7) The regional manager or the regional manager's designate must determine a an allowable annual cut for each community forest agreement area, in accordance with
- (a) the community forest agreement, and
 - (b) any directions of the chief forester.
- (8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider
- (a) the rate of timber production that may be sustained on the area, taking into account
 - (i) the composition of the forest and its expected rate of growth on the area,
 - (ii) the expected time that it will take the forest to become re-established on the area following denudation,
 - (iii) silviculture treatments to be applied to the area,
 - (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,
 - (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and
 - (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,
 - (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

- (c) Repealed [2003-31-02]
- (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.

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

Section 4 of the *Ministry of Forests and Range Act* (consolidated 2006) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to
 - (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 co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the government and with the private sector;
 - (d) encourage a vigorous, efficient and world competitive (i) timber processing industry, and (ii) ranching sector in British Columbia; and
 - (e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Document attached:

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



JUL 04 2006

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

Dear Jim:

Re: Economic and Social Objectives of the Crown

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

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

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

Page 1 of 2

**Minister of
Forests and Range
and Minister Responsible
for Housing**

Office of the
Minister

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

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

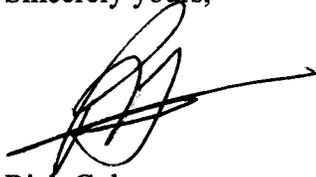
Jim Snetsinger

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

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

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

Sincerely yours,

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

Rich Coleman
Minister