

**British Columbia
Ministry of Forests and Range**

**Rationale for Increase in
Allowable Annual Cut (AAC)**

Innovative Forestry Practices Agreements

Issued to

Tolko Industries Ltd.
Aspen Planers Ltd.
Ardeu Wood Products Ltd.
Weyerhaeuser Canada Ltd.
Stuwix Resources Ltd.

**Effective
August 2, 2007**

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Regional Manager
Southern Interior Forest Region**

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Executive Summary

Section 59.1 of the *Forest Act* enables the Ministry of Forests and Range (MFR) regional manager to increase the current allowable annual cut (AAC) associated with the licence of an innovative forestry practices agreement (IFPA) holder. An increase in AAC must be justified based on the IFPA-holder documenting their innovative forestry practices or activities in a forestry plan approved by the regional manager and demonstrating the impacts of the practices on timber supply by methodology approved by the chief forester.

In the Merritt timber supply area (TSA) there are six forest licences with IFPAs. The licensees work collaboratively through the Nicola-Similkameen Innovative Forestry Society (NSIFS) in developing and implementing a consistent forestry plan and allowable annual cut increase application.

In the spring of 2003, NSIFS successfully submitted an application to the regional manager for an allowable cut increase. The regional manager awarded a 330 700 cubic metres per year increase based on the documented innovative forestry practices that included improved vegetation inventory, site productivity, deer winter range, old growth, and riparian information. On March 30, 2005 NSIFS made application for a further 500 000 cubic metres increase, based on innovative forestry practices that enhance efforts to suppress the Mountain pine beetle (MPB) infestation. The regional manager accepted the proposal and on July 13, 2005 determined the allowable annual cut increase under Section 59.1 of the six forest licences to be a total of 830 700 cubic metres. This increase was subjective to several conditions.

The innovative forestry practices agreements in the Merritt TSA were originally issued on March 25, 1998 for a ten year term. Recognizing this expiry date, the regional manager in his July 2005 rationale for an allowable annual cut increase had specified the increase would expire December 31, 2007. In January 2007 the Minister of Forests and Range authorized the regional managers to accept applications to extend agreements to August 31, 2011. Subsequently, the expiry date of the Merritt IFPAs has been extended, thus enabling the potential to extend the allowable annual cut increase.

On May 8, 2007 the NSIFS submitted an application to extend the current level of allowable annual cut increase of 830 700 cubic metres to August 31, 2011. I have reviewed that application in light of my previous rationale, information around current mountain pine beetle infestation, and consultation with First Nations.

In this rationale, I determine that it is reasonable to continue the current level of a 830 700 cubic metres increase for the allowable annual cut of the IFPA-holders' forest licences. I also recognize uncertainty related to several of the innovative forestry practices and therefore continue to make the increase subject to conditions.

The 830 700 cubic metres awarded under Section 59.1 will be allocated as follows:

- A18695 - Aspen Planers Ltd. by 59 649 cubic metres per year;
- A18696 - Tolko Industries Ltd. by 118 711 cubic metres per year;
- A18697 - Tolko Industries Ltd. by 7 640 cubic metres per year;
- A18698 - Weyerhaeuser Canada Ltd. by 160 926 cubic metres per year;
- A18039 - Ardeu Wood Products Ltd. by 29 369 cubic metres per year; and
- A65006 - Stuwix Resources Ltd. by 454 405 cubic metres per year.

The determination is effective July 31, 2007 and will remain in effect until August 31, 2011 unless otherwise determined.

Objective of this Document

This document is intended to provide an accounting of the factors that I, as regional manager of the Southern Interior Forest Region, have considered, and the rationale that I have used in making my determination, under Section 59.1 of the *Forest Act*, of a request dated May 7, 2007 to maintain the current increase in allowable annual cut (AAC) of the replaceable forest licences FL A18695, A18696, A18697, A18698, A18039, and A65006 under Innovative Forestry Practices Agreements (IFPAs).

The document outlines the background of the Merritt IFPAs, the statutory framework, guiding principles for the determination, the role of timber supply analysis in the process, the consideration of factors influencing the timber supply analysis, the impacts on other licensees, First Nations' considerations, the Reasons for Decision, the determination, conditions and recommendations. The appendices contain the IFPA legislation and memorandum from the chief forester on timber supply methodology. This rationale does not identify all the work completed by the IFPA-holders but is intended to address the allowable annual cut increase application and resulting determination needs.

Merritt Innovative Forestry Practices Agreements

In the Merritt timber supply area (TSA), IFPAs were issued on March 25, 1998 for a ten-year term to: A18695 – Aspen Planers Ltd.; A18696 – Tolko Industries Ltd.; A18697 – Riverside Forest Products Ltd. (now Tolko Industries Ltd.); A18698 – Weyerhaeuser Canada Ltd.; and A18039 – Ardeu Wood Products Ltd. On December 1, 2001 a sixth IFPA was issued to A65006 – 9135 Investments Ltd. (now known as Stuwix Resources Ltd.). On August 2, 2007, the expiry date of all six IFPAs was extended to August 31, 2011. The Nicola-Similkameen Innovative Forestry Society (NSIFS) acts on behalf of the six IFPA-holders.

Statutory Framework

Section 59.1 of the *Forest Act* enables the regional manager to increase the current allowable annual cut associated with the licence of an innovative forestry practices agreement holder. Prior to such approval, the regional manager must have approved a forestry plan in which the innovative forestry practices or activities are identified.

Eligible categories of innovative forestry practices and activities are described in the Innovative Forestry Practices Regulation. These categories include improvements due to harvesting or silvicultural systems, silvicultural treatments, collection and analysis of new data on forest composition and expected growth, and management activities to enhance and protect other resource values. To be eligible, the practices and activities must be within the forestry plan approved by the regional manager.

An increase in AAC must be justified based on timber supply analysis methodology approved by the chief forester. The chief forester has made known his approved timber supply analysis methodology in a memorandum dated April 6, 2001 to the regional managers. This memorandum provides the general principles of the timber supply analysis methodology that is required to justify an increase in allowable annual cut to the licence of an innovative forestry practices agreement holder. Further, the collection and analysis of new data must be in accordance with the available specifications of the chief forester.

Under section 59.1 of the *Forest Act*, the regional manager can limit an allowable annual cut increase to a period of time, area of land, type of timber or any other condition. The regional manager can also reduce or eliminate an increase at any future time given new information or for non-compliance with the forestry plan or the conditions set. The regional manager can suspend or cancel an innovative forestry practices agreement if the holder is not complying with the agreement, forestry plan, conditions, *Forest Act*, or *Forest and Range Practices Act*.

Section 59.1 of the *Forest Act*, the Innovative Forestry Practices Regulation, and the memorandum on timber supply methodology from the chief forester are appended to this rationale.

Guiding Principles

As I expected to make a number of decisions with respect to innovative forestry practices agreements under section 59.1 of the *Forest Act*, I have outlined the following guiding principles. These principles assist me in ensuring administrative fairness and consistency in how I approach my decisions.

- For an innovative practice or activity to be considered in an allowable annual cut increase decision, the practice or activity must be either currently implemented or the plans for the practice must be clear, practical, and feasible. Given the nature of

innovative practices, I accept that some innovative activities presented may be at an initiation stage rather than at a current practice stage.

- Innovative practices or activities identified in the approved forestry plan, but which are not addressed in an allowable annual cut increase request, need to be considered in the allowable annual cut increase determination. It is my expectation that the IFPA-holder will work towards implementing the forestry plan as approved. My approval is based on the whole plan, not simply components that might result in increased timber supply. As such, I may weigh the risks of practices not yet carried out against identified increases presented to me.
- Any allowable annual cut increase decision should be made in the context of current government policy. While I may be aware of proposed policy changes that could impact an allowable annual cut increase decision, I must be mindful of the ever changing nature of proposed policy and not speculate on the acceptance of proposed policy. Similarly, it would be inappropriate for me to speculate on the impacts of strategic land-use or treaty processes before the decisions have been made by government and the appropriate implementation details have been determined.
- The most recent timber supply review for the management unit in which the IFPA is located provides the basis for describing current practice. This base may be updated with new information or management practices that are not innovative practices or activities. While I will not credit the IFPA-holder for increases in harvest flow associated with practices that are not defined as innovative in the forestry plan and regulation, I must consider impacts on the harvest flow of these updates in relation to the base allowable annual cut and to any benefits derived from innovative practices and activities.
- The right of the IFPA-holder's licence to access timber volume within the timber supply area is not affected by the IFPA unless otherwise agreed upon. I expect that any increase in AAC will be harvested from within the IFPA boundaries in accordance with the information and practices identified in the IFPA review.
- An allowable annual cut increase awarded under the IFPA must not cause a negative impact on non-IFPA licensees operating within the IFPA boundaries without the approval of the non-IFPA licensee. The non-IFPA licensees can agree to manage their operating areas within the IFPA area in accordance with the IFPA forestry plan but are not eligible for any AAC increase. However, any AAC increase associated with innovative practices carried out under the IFPA forestry plan within the IFPA area can be attributable to the IFPA-holder, even if the activities are undertaken by a non-IFPA licensee.
- IFPA practices and activities can be assumed to apply to areas that are temporarily excluded from the IFPA (e.g., timber licences, partitions outside of the IFPA-holder's licence) only after they have reverted to timber supply area status. Any increases in harvest flow identified on these stands before they revert will not be eligible under the IFPA. However, I recognise that these areas, when they revert to TSA status, are subject to licensee negotiations and, while the IFPA-holder does not have a specific right to harvest from such future stands, the IFPA-holder is as likely as others to obtain such rights. As such, I will consider these stands to be within the IFPA area at the time they revert.

- Uncertainty exists in the data and management practices presented and modelled in a review of timber supply. In my decision, I must consider this uncertainty and associated risks and, where necessary, I can account for such.
 - One method to reduce risk is to periodically review the determination. As such, I will specifically assign a time period for which an allowable annual cut increase is applicable. Nevertheless, if prior to this time period, new information or an assessment of the innovative practices indicates that the increment is not justified, or the licensee is not complying, I have the right to remove or decrease any allowable annual cut increase that I may have determined.
 - A second method to reduce risk associated with an increased harvest flow is to award a lower AAC increase than the timber supply analysis suggests. The level of caution that I exercise will depend on the uncertainty of the timber supply increase being attributed to an innovative practice, which is normally related to the quality of the information on the practice, and to inherent uncertainties in ecological dynamics and biophysical factors.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from recent court decisions including those in the British Columbia Court of Appeal and the Supreme Court of Canada. The allowable annual cut increase that I may determine should not in any way be construed as limiting those obligations under these decisions.

In my decision, I have considered all information brought forward respecting First Nations' interests, including information from the chief forester resulting from his July 1, 2005 Section 8 determination and my previous Section 59.1 determinations. If, subsequent to my determination, I become aware of information respecting First Nations' interests that was not available to me at the time of this decision, and indications are that all or part of the allowable annual cut increase was not justified, I will re-visit my determination.

My acceptance of information on practices within this decision does not supersede or fetter other statutory decision-making authorities, and is not to be construed as approval required by any other authority or agency.

In making my decision, I am aware of my obligations as a steward of the forests of British Columbia and of the mandate of the Ministry of Forests and Range as set out under the relevant legislation.

Information Sources

In making this decision, I have considered information from a variety of sources. Many of these sources were used to compile a technical summary for my July 2005 determination and the chief forester's allowable annual cut determination for the Merritt TSA. This document was one of my primary sources for reviewing this decision.

- Ministry of Forests (unpublished). Urgent timber supply review for the Merritt TSA: technical summary for the allowable annual cut determination meeting for Section 9 and Section 59.1 decisions. May 18-19, 2005, Quilchena Hotel, Quilchena, BC.

I have also reviewed previous determinations:

- Zacharatos, T.P. Rationale for Increase in Allowable Annual Cut (AAC) Determination. Merritt Innovative Forestry Practices Agreement. Southern Interior Forest Region. British Columbia Ministry of Forests. Effective July 13, 2005.
- Baxter, F. Rationale for Increase in Allowable Annual Cut (AAC) Determination of Merritt Timber Supply Area Innovative Forestry Practices Agreements. Southern Interior Forest Region. British Columbia Ministry of Forests. Effective January 1, 2004.

Further information sources that underlie the technical summary and 2005 rationale are listed in Appendix 5 of the July 2005 rationale.

NISFS since the last determination have provided a number of updated documents including the application, a new forestry plan, annual reports, confirmation of the share agreement, and reports on the Mountain pine beetle infestation.

- Nicola-Similkameen Innovative Forestry Society. Letter on Share Agreement & Innovative Forest Practices Agreement Annual Allowable Cut Apportionments. June 7, 2007.
- Nicola-Similkameen Innovative Forestry Society. Merritt TSA Nicola-Similkameen Innovative Forestry Society (NSIFS) Extension Request. April 2007.
- Nicola Tribal Association. NSIFS Communications Liaison Final Report. Tmix^w Research Department. March 28, 2007.
- Nicola-Similkameen Innovative Forestry Society. Mountain Pine Beetle Strategy 2006 Annual Report. January 23, 2007.
- Nicola-Similkameen Innovative Forestry Society. 2005-06 Annual Report for the Merritt IFPAs. April 21, 2006.
- Nicola-Similkameen Innovative Forestry Society. Annual report for conditions arising from the July 13, 2005 AAC determination conditions. January 30, 2006.
- Nicola-Similkameen Innovative Forestry Society. 2005 Forestry Plan. for the Innovative Forestry Practices Agreements in the Merritt Timber Supply Area. August 24, 2005.

I have also considered other information sources that have been released since the July 2005 rationale including:

- Timberline Forest Inventory Consultants Ltd. Merritt TSA Enhanced Type 2 Silviculture Strategy Analysis. Prepared for Forest for Tomorrow, Southern Interior Forest Region, Ministry of Forest and Range, April 2007.
- Walton A., Hughes J., Eng, M. Fall, A., Shore, T., Riel, B., and Hall.P. 2007. Provincial-Level Projection of the Current Mountain Pine Beetle Outbreak: Update of the infestation projection based on the 2006 Provincial Aerial Overview of Forest Health and revisions to the “Model” (BCMPB.v4). Ministry of Forests and Range, Research Branch, Victoria, BC.
- Coleman, R. Letter to IFPA-holders about agreement extensions. January 19, 2007
- Snetsinger, J. Guidance on landscape- and stand-level structural retention in large-scale Mountain pine beetle salvage operations. December 2005.

With respect to First Nations consultation my staff have prepared an internal summary of the consultation.

- Pitts, K. 2007. Consultation summary - Merritt Innovative Forestry Practices Agreement Expiry Date Extension and Allowable Annual Cut Increase Extension. August 1, 2007 Memorandum to Regional Executive Director.

To assist me with my decision, I have had discussion with Ministry of Forest and Range staff around the technical review and evaluation of current operating conditions including a meeting April 5, 2007 with regional and district staff to review the July 2005 allowable annual cut increase in relation to current mountain pine beetle information and activities of the IFPA-holders.

Forestry Plan

Prior to awarding an allowable annual cut increase under Section 59.1, the regional manager must have approved a forestry plan in which the innovative forestry practices or activities are identified.

NSIFS presented an updated forestry plan on August 24, 2005 that addressed a condition of my July 5, 2004 letter extending the previous plan. I approved this updated forestry plan on February 24, 2006 and it remains valid until the expiry of the innovative forestry practices agreements.

Allowable Annual Cut Increase Application

In correspondence dated May 7, 2007, NSIFS applied to the regional manager to extend the current level of an allowable annual cut increase of 830 700 cubic metres from the current expiry date of December 31, 2007 to August 31, 2011.

The application affirmed the society's vision, strategic objectives, and innovative forestry practices around the Mountain pine beetle infestation. The application provided timber supply analysis that looked at harvest flow and the availability timber supply under a variety of assumptions. The application contained background on how the society addressed past conditions associated with previous allowable annual cut increases. The society also presented letters from First Nations in support of the extension of the agreements and the allowable annual cut increase.

The Role of Timber Supply Analysis

Section 59.1(7) of the *Forest Act* identifies that an increase in allowable annual cut must be justified according to timber supply analysis methodology approved by the chief forester. The chief forester has made known this methodology in a memorandum dated April 6, 2001. The memorandum provides the general principles, not detailed procedures, of timber supply analysis required to assist my decision.

The timber supply analysis consists of two components. The first component is an information package that includes information from three categories: land base and inventory; timber growth and yield; and management practices. The second component is a suite of timber supply forecasts based on the information package that investigates different harvest flow options and data uncertainty.

To determine an increase in AAC requires that I have both knowledge of timber supply based on current practices and of the changes associated with the IFPA innovative practices and activities. As such, the timber supply analysis provides separate forecasts without and with innovative forestry practices and activities.

For the current allowable annual cut increase application, I made use of timber supply analysis provided by NSIFS in their May 2007 application but I have also made use of the analysis provided for their 2003 and 2005 AAC increase applications. While none of these analyses are able to provide me with the "complete picture", I find that as whole they are sufficient to inform me about the timber supply dynamics with respect to current management.

These timber supply analyses with which I am provided are integral components to my review of the allowable annual cut increase application. However, the determination itself is not a calculation but a synthesis of judgement and analysis in which numerous risks and uncertainties are weighed. Analytical tools such as forest estate models cannot incorporate all the social, cultural, and economic factors that are relevant when making

forest management decisions. As such, depending upon the outcome of these considerations, the increase in AAC determined may or may not coincide with harvest flows identified in the timber supply analyses. It should be recognized that I may view the information, uncertainty, and risks of the various analyses different from previous determinations in light of new information.

In this rationale, I will not discuss in detail many of the timber supply analysis assumptions or factors where I am satisfied that such is appropriately considered and has not changed from the description in the July 2005 rationale. Nevertheless, I may elaborate on appropriately modelled factors for reasons such as the existence of a condition or high level of public input.

Consideration of Factors

I have reviewed the timber supply analysis considerations in my July 2005 rationale for the existing allowable annual cut increase. I find that this 2005 rationale still describes sufficiently my considerations around the timber supply analysis and I will not repeat those considerations in detail within the current rationale except where I believe changes have occurred or a need to elaborate is present.

In the 2005 rationale, I noted that the decision to set an expiry date of December 31, 2007 for the allowable annual increase was based upon my uncertainty around the appropriateness of assigning an increase beyond the term of the agreement. The society's strategy and analysis had suggested the need for 7 years of increased harvest levels to address Mountain pine beetle.

The factors below are those for which I believe some discussion is necessary. My primary consideration is around the society's Mountain pine beetle innovative forestry practices, as such, much of my discussion will be around these practices.

Forest Inventory

The NSIFS initiated a Vegetation Resource Inventory (VRI) phase II program that consisted of 125 VRI timber emphasis plots established according to standards. This sample suggested that the inventory (vegetated treed stratum all age classes combined) was underestimated by 6%. Although this value was not statistically different from the unadjusted inventory volumes, standard procedures would result in the use of the mean of the adjusted values. In previous determinations, the regional manager has accepted this improved information as an innovative forestry practice.

Different methods are possible for adjusting the aerial photo based inventory (Phase I) based on the ground sample (Phase II). In the 2003 IFPA analysis, NSIFS did not use the government recommended Fraser Protocol adjustment procedures as they had

encountered problems with its application. As the problems were not well documented, I had asked that NSIFS identify and document the deficiencies in the Fraser Protocol adjustment and its implications for the analysis or alternatively complete a new timber supply analysis with accepted adjustment procedures. To fulfil this condition, NSIFS asked Timberline Forest Inventory Consultants Ltd to document the problem and concerns about the Fraser Protocol. Unfortunately, Timberline was not able to readily determine the reasons for the discrepancy. After conversation with the consultant, ministry staff agreed that further exploration would not provide a definitive answer.

For the current decision, the analysis information still does not address my concerns around the application of the adjustment. The timber supply analysis used in May 2007 application used an updated inventory file. However, this file did not include a VRI phase 2 adjustment as work on the associated net volume adjustment factor sampling needs to be completed. Nevertheless, the current forest inventory and the VRI phase 2 samples provides relative information on the existing forest.

Forest inventory provided information on the state of the forest at the time of the sample. With such information we can predict forest conditions into the future with growth and yield models. However, the Mountain pine beetle infestation will result in forest changes that are not predicted by current growth and yield models and were not captured in the Phase 2 samples. As such, over time, inventory information derived from the present Phase 2 samples becomes less relevant.

I find that it is important to view forest inventory as an activity that needs ongoing attention. Nevertheless, from a modelling context I note that improved information obtained from Phase 2 sampling is initially relevant. The dead trees will still have volume identified from Phase 2 until they are beyond their shelf life. I also note that future stand volumes are not directly impacted by a forest inventory adjustment as they are based on silvicultural assumptions, site index estimates independent of the inventory, and non-inventory based growth and yield models.

In conclusion, the uncertainty around the adjustment procedures and implications of Mountain pine beetle induced mortality causes me some concern. I will discuss my considerations within my Reasons for Decision.

Site Productivity

NSIFS had spent considerable effort around innovative forestry practices that better identified the productivity of the land base. This work involved developing improved potential site indices and applying adjustments, where obtainable, from statistically based field samples. These adjustment projects contributed to identifying an increase in available timber supply in the mid- and long-term and therefore enabled some increases in short-term availability of timber supply.

In the 2005 rationale, the society as a condition was to implement a growth and yield monitoring plan to identify deviations from the expected overall average site productivity estimates modelled. To date, the society has prepared a monitoring plan and has established 28 of a proposed 49 monitoring plots.

I continue to recognize that this work is an innovative forestry practice that contributes to harvest flow increases and I encourage the society to complete the establishment of monitoring plots that will improve our knowledge of the site productivity response. Given the importance of this knowledge for mid-term availability, this will remain a condition.

Landscape Biodiversity

NSIFS identified draft old growth management areas (OGMAs) to address landscape biodiversity requirements for the Merritt TSA. The identification of the OGMAs was assisted using the predictive ecosystem mapping (PEM) tools that NSIFS had developed. In the 2003 analysis, spatially located OGMAs were applied to 4 landscape units only. At the time, government staff had concerns that the impact of OGMAs would be significantly higher than modelled and in my previous rationales an accounting for such had been made that lowered the harvest flow expectations.

In the Merritt TSA (i.e., IFPA area) the landscape biodiversity objectives are identified within the Provincial Non-Spatial Old Growth Order effective June 30, 2004 issued under section 4 of the Forest Practices Code that approved landscape units and non-spatial old forest retention targets for BEC units. These non-spatial objectives were considered in my July 2005 determination. Subsequently, in March 2006 under Section 8 of the order draft spatial OGMAs were identified for the Merritt TSA. Further these OGMAs have been updated by ILMB and are expected to be made available for information purposes in the near future.

The May 2007 application included scenarios based on the April 2007 Enhanced Type 2 Silviculture Strategy Analysis. This analysis used a land base that included the draft spatial OGMAs. However, this analysis, while providing me an overall sense of harvest flow for the many changes, did not specifically provide further information specific to the timber supply implications of the OGMAs.

In December 2005, the chief forester provided guidance on landscape and stand-level retention to forest professionals to mitigate the impact of large-scale operations on other resource values such as biodiversity and hydrological function (“Forest Stewardship in the Context of Large-Scale Salvage Operations”). In that document, he recognized the key to good beetle harvest planning is to plan out for many years for both the retention and harvest areas. His guidance included developing temporally and spatial explicit plans that recognize the non-pine retention needs for the mid-term and the need to plan cooperatively. District staff had provided similar guidance that I noted within the July 2005 rationale.

The practices around Mountain pine beetle harvesting and the current cooperation of licensees in the Merritt TSA does reflect the chief forester's guidance. The society notes the commitment of companies and professionals involved with the forest planning to increased protection of other values through the beetle epidemic. In terms of planning, I encourage the society to further developed their proposed strategy around evaluation of understory species and to further consider the guidance of the chief forester with respect to retention planning.

For this determination, I find uncertainty still exists from both the analysis and from the on ground practices around landscape biodiversity. I have accounted for such uncertainty in the previous determinations and I will concur with the accounting of the July 2005 rationale for this rationale.

Stand Level Biodiversity

Biodiversity is assessed and managed at both the landscape and stand levels. At the stand level biodiversity is managed in part by retaining reserves of mature trees or wildlife tree patches within cutblocks to provide structural diversity and wildlife habitat. It is also managed by maintaining appropriate levels and placement of coarse woody debris.

In December 2005 guidance on "Forest Stewardship in the Context of Large-Scale Salvage Operations", the chief forester made several recommendations around stand-level planning and operations. These recommendations include increase stand level retention where large scale harvesting is occurring. Similarly the Cascades Forest District staff, as identified in the July 2005 rationale, have made recommendations with which I am in agreement are appropriate for good stewardship.

For the analysis associated with this application, NSIFS modelled a land base net down for wildlife tree patches. In the accounting for my July 2005 decision, I had found that this modelling was insufficient for existing wildlife tree management. Further, there is some expectation that with increased harvesting due to Mountain pine beetle, further retention is desirable.

No accounting is made for coarse woody debris in the analysis as it was expected that coarse woody debris can be appropriately managed without timber supply implications. This assumption is likely true for most sites but in certain situations I could envision the need for retention that might have small impacts.

In this decision, given the uncertainty around the exact management for stand-level biodiversity and timber supply impacts, I concur with my July 2005 accounting for wildlife tree management and for coarse woody debris.

Deer Winter Range

As an innovative forestry practice, NSIFS had created deer winter range management zones and assessment units based on tools that they developed (e.g., PEM) in their original allowable annual cut increase application. Subsequently, these draft areas provided information to government agencies responsible for developing such management zones and guidelines. The Ministry of Environment is currently finalizing mule deer winter range management zones but these zones have not yet been identified through an order.

In my 2003 decision, I had found that the modelling application of the identified deer winter range was wanting. Environment staff had expressed concerns that such application would be less constraining and at that time I had found a need to account for the uncertainty around the proposed deer winter ranges in relation to the observed increase in harvest flow. In this decision, I concur with my July 2005 accounting for deer winter range

In the July 2005 rationale, I had asked that NSIFS work with government where possible in completing deer winter range mapping and management objectives and when these plans were completed to submit an analysis of the impacts on timber supply within 6 months of the statutory decision maker approval of the deer winter range or as otherwise arranged with the regional manager. Recently, the Ministry of Environment has assessed the timber supply implications of their proposed deer winter range and objectives. I encourage the society to examine this analysis and report on the results in light of the conditions of the July 2005 rationale.

Mountain Pine Beetle Infestation

While Mountain pine beetle are part of the natural process of lodgepole pine ecosystems, the current outbreak has reached unprecedented levels in British Columbia. The Ministry of Forests and Range projects that 80 per cent of the merchantable pine in the province's central and southern Interior could be killed by 2013. In the Merritt TSA, Lodgepole pine is the leading component of 70% of the stands, making up 50% of the volume in the timber harvesting land base. Mortality in these stands due to the continued expansion of the infestation will substantially affect timber supply in the short and mid-term.

In the Merritt TSA, Mountain pine beetle populations are in the mid stages of rapid expansion. In 2003, regional aerial overview surveys indicated 7500 ha of MPB infested stands. Subsequently, the area infested has expanded to 30,000 ha in 2004, 75,700 ha in 2005, and 141,000 ha in 2006. A major portion of the current infestation occurs in the northern parts of the TSA in highly susceptible stands. Predictive models based on provincial averages of MPB infestation indicate rapid expansion in future years with a peak in green attack expected in 2008. The predicted cumulative pine killed is expected to increase from 16% in 2006, to 63% in 2010, and 75% in 2014.

Forest managers and entomologists have suggested that the diverse landscape of the Merritt TSA, in terms of geography and ecosystems, may allow the slowing of Mountain pine beetle expansion as compared to areas such as the central plateau where there were few geographic or species impediments to beetle expansion. The possibility of such control is suggested by the management of an outbreak in the southern portion of the TSA in 1999. Cascades Forest District staff and licensees believe that, through the effort of licensees who adjusted their harvest priorities, this outbreak in 1999 was contained to manageable levels.

In 2005 to address the Mountain pine beetle expansion, NSIFS proposed, as an innovative forestry practice, a management strategy that was incremental to the forest health plan current at that time in Merritt TSA. The strategy was aimed at maintaining the existing mature pine inventory as long as possible and therefore minimizing the drop between the mid-term and long-term timber supply. The strategy was directed at timely harvest of infested stands through earlier detection of priority beetle infested stands, maximizing harvest by critical dates, silviculture performance on beetle affected areas, a roads ahead program to ensure access, and appropriate reporting to assess the outbreak.

In my July 2005 rationale, I accepted components of the proposed strategy as innovative forestry practices and increased the allowable annual cut awarded under Section 59.1 to 830,700 cubic metres. In the rationale I expressed concerns about the projected ability of the strategy to slow the beetle expansion. As such, this award was conditional for a number of factors particularly on the success of the Mountain pine beetle strategy.

At the time of the award, the strategy provided by the IFPA-holder was more of an outline than a specific document. Subsequent to the award, the IFPA-holders developed a more comprehensive beetle response and management strategy. This strategy is documented within annual reports provided to me as a condition of the allowable annual cut increase. The practices associated with the strategy included incremental data collection (i.e., early overview flights and follow up ground surveys), forecasting and monitoring of beetle spread, co-ordinated plans among licensees, roads ahead planning, and proactively considering environmental objectives. The strategy continues to evolve and the current application provides further considerations around issues such as stand selection.

Underlying the acceptance of these practices was the objective of slowing the spread of the infestation. The slowing of the spread of beetle results in forest managers being able to capture timber supply whose decay is delayed because it is infected later. If killed earlier the volume in these stands would have been lost due to the lack of physical access, lack resources for harvesting, or the undesirability of an accelerated harvest.

As a condition of the July 2005 allowable annual cut increase, the society was required to document their management, monitor the infestation spread, and to assess the success of their strategy within an annual report provided to the regional manager. The information from the society enhances information provided by MFR regional and district staff.

The 2006 annual report dated January 23, 2007 identifies that the IFPA-holders have acted upon their strategy through the completion of survey work, harvest planning, and the harvest of priority stands. The IFPA-holders collectively have increased the proportion of the harvested volumes that have been affected by Mountain pine beetle from 84% in 2005 to 96% in 2006. Further in 2007 the licensees plan that 100% of the harvest will be from infested stands.

NSIFS had provided projections of Mountain pine beetle expansion through a simple exponential model. At the time of the 2005 decision, Ministry staff expressed opinion that the rate of Mountain pine beetle expansion was likely low in the NSIFS model and was possibly high in the more complex MFR Research Branch model. On the ground results confirm that the rates expressed by the society initially were low. The initial NSIFS projected rate of increase was 1.5 but the realized expansion rate was 1.85 in 2005 and 1.73 in 2006.

These expansion rates might be considered to suggest that the Mountain pine beetle strategy of the IFPA-holders is not working and fails to slow the spread of the infestation. However, Lorraine Maclauchlan MFR regional entomologist has indicated that in her opinion the current strategy has locally slowed the infestation. At the TSA level the expansion has been greatly affected by infestation spread from outside of the TSA. Detailed summaries indicated that while the overall infestation has continued to grow, the area of heavily infested stands has not increased as rapidly likely due to the planning and harvesting strategy of the IFPA-holders.

NSIFS in 2006 revised their predictions of non-recoverable losses based on the higher spread rates. These predictions, while not as optimistic, suggest that the strategy will still enable the slowing of the expansion. This slowing still results in the recovery of more pine as shown in analysis from the society. Nevertheless, eventually most pine stands will be impacted by the Mountain pine beetle.

I am satisfied that the overall intent of, and individual practices within, the proposed Mountain pine beetle management strategy proposed by the IFPA-holders, meet criteria under the Innovative forestry practices regulation as authorized innovative forestry practices and activities, and that the approved forestry plan contains sufficient information for me to consider in determining if an increase in allowable annual cut is still justified.

I will discuss this factor further under 'Reasons for Decision'.

Impacts on Other Licensees

Under my guiding principles, I identify that an allowable annual cut increase to IFPA-holders should have no impact on rights of those who are not IFPA-holders.

In the original rationale for an allowable annual cut increase to the IFPA-holders, the concerns of smallwood licensees operating within the Merritt TSA and B.C. Timber Sales Kamloops were considered. At that time, four of the smallwood licensees who responded supported NSIFS's application (1 licensee had not responded) and BCTS agreed to work with the IFPA-holders.

No subsequent comments were brought to my attention by other timber tenure holders. I note that the current licences of IFPA-holders do not permit harvesting of smallwood except for reasons such as Mountain pine beetle outbreak. NSIFS also appears to be willing to freely share information with non-IFPA licensees and BCTS with respect to their innovative forestry practices as well as First Nations that have been awarded timber volume.

I do not foresee that the innovative forestry practices proposed would have negative impact on other licensees. I would expect that if increased harvest is needed in smallwood pine, licensees including BCTS would work together appropriately and that NSIFS would work to ensure that non-IFPA licensees are not negatively impacted.

First Nations Consultation

The Nlaka'pamux and Okanagan Nations have traditional territories within the IFPA area. The IFPA area covers the communities of the following six First Nations: Coldwater Indian Band, Lower Nicola Indian Band, Nooaitch Indian Band, Shackan Indian Band, Upper Nicola Indian Band and Upper Similkameen Indian Band. Six other First Nations' communities located outside the IFPA area have reserves and/or traditional interests within the IFPA area. These are the Westbank First Nations (Westbank), Lower Similkameen Indian Band (Keremeos), Nicomen Indian Band (near Spences Bridge), Cook's Ferry Indian Band (Spences Bridge), the Siska Indian Band (near Lytton), and the Kamloops Indian Band.

The above First Nations with interests within the Merritt TSA were engaged in consultation regarding the extension of the IFPA expiry date and the extension of the current allowable annual cut increase.

NSIFS initiated information sharing with First Nations in February 2007 with respect to the extension of the innovative forestry practice agreements and the current allowable annual cut increase. Within the allowable annual cut increase application, NSIFS presented signed letters from First Nations with interest in the Merritt TSA. These letters indicated that First Nations had been informed of the application and that they agreed with the expiry date extension and continuation of the current allowable annual cut increase. The following First Nations provided such letters: Upper Nicola Indian Band, Lower Nicola Indian Band, Nooaitch Indian Band, Upper Similkameen Indian Band, Coldwater Indian Band, Shackan Indian Band, Cook's Ferry Indian Band, Siska Indian Band, Lower Similkameen Indian Band, Nicomen Indian Band, and Westbank First Nation.

On May 7, 2007 NSIFS formally made their application to extend the current level of the allowable annual cut increase to August 31, 2011. Following receipt of this application, an invitation to a May 31, 2007 general consultation workshop to discuss the IFPA decision process was sent (May 9, 2007) to all First Nations with an interest in the Merritt TSA. The ministry formally initiated the consultation process at the workshop and by letter mailed to each First Nations on May 31, 2007.

At the May 31, 2007 consultation workshop held in Merritt, my staff presented a brief overview of my process for Section 59.1 decisions and solicited information from First Nations present. At the workshop representatives or technical advisors for the many but not all First Nations were present. Little discussion occurred around the Section 59.1 decisions, however, one point of note from Gary Arnold, Woodlands Manager, of the Upper Nicola Indian Band was that harvest volume needs to be brought to the community as a whole and that any allowable annual cut increase is extra impact on title. As a follow up to the workshop, my staff sent a letter to First Nations on July 13, 2007 summarizing the workshop and soliciting final input by August 1, 2007.

My staff has prepared for my consideration a summary of the consultation. This summary documents the key communications that I received and shared with respect to this decision and an overview of relevant information sources available within the Merritt TSA. I have also considered information received from other decisions processes, particularly with respect to my previous decision on an increase in allowable annual cut under Section 59.1 and the July 1, 2005 chief forester's AAC determination for the Merritt TSA. These sources have helped my awareness of First Nations concerns regarding the allocation of timber rights, accommodation agreements, incorporation of traditional use information, environmental issues of increased harvest, and capacity to participate in future planning initiatives and referral processes.

With respect to the Nicola Similkameen Innovative Forestry Society, I note that the society's actions have supported their identified strategic objective of:

Support First Nation's communities

- *Ensure First Nation's role in the management of the NSIFS*
- *Incorporate First Nation's values in the management of the IFPAs*
- *Increase forest sector business opportunities for First Nations.*

This support includes Ardeu Wood Products Ltd. offering part of their replaceable forest licence to local First Nations and thus allowing Stuwix Resources Ltd. to obtain an innovative forestry practice agreement. The share agreement also demonstrates a willingness to engage First Nations as Stuwix Resources Ltd. is recommended to receive the majority of any allowable annual cut increase. Projects of the society also have featured the development of cultural value models and involvement of First Nations. The engagement of First Nations in the Merritt TSA has been a highlight of the innovative forestry practices agreement pilot program. I do note one inquiry that identified a current lack of knowledge on the administration and funding of projects of the NSIFS.

With respect to the durability of the benefits to First Nations derived from the innovative forestry practice agreement, I note Chief David Walkem has expressed on many occasions a concern about the length of an awarded increase under Section 59.1. Chief Walkem identifies that the lack of “permanency” influences the ability of Stuwix Resources Ltd. to establish a market for their allocated volume and thus provide security for its work force. As noted in my previous rationale, I am not enabled to address the “permanency” issue and that this issue has been brought to the attention of the minister. While the issue of permanency has not yet been addressed, the current direction outlined in a January 19, 2007 letter emailed from the minister to all agreement holders is that the regional manager is not authorized to extend an allowable annual cut increase beyond the expiry of the innovative forestry practices agreement. The letter also indicates that the ministry is continuing to evaluate the IFPA program.

In my July 2005 decision rationale I detailed several conditions with respect to the documentation and provision of information on First Nations involvement and the development of tools around traditional use. I also desired that the ministry provide funding to assist with some of this work. As a result of this desire, the ministry provided to the NSIFS funding for liaison work around their cultural modeling and traditional use projects. Upper Nicola Indian Band received also received specific funding to address a proportionately larger Mountain pine beetle impact within their traditional area. For this decision I find that it is still reasonable to consider that it would be a measure of good faith by the ministry to seek funding to assist First Nations with activities associated with increased harvesting including the development of tools around traditional use.

Considering the information that I have been presented, I have concluded the following:

- I am satisfied that the Provincial Policy for Consultation with First Nations has been adhered to and, that even with the initial expedited review request, reasonable opportunities have been made to the First Nations Bands to make direct presentation about the allowable annual cut increase application.
- I have considered the issues and materials presented to me by First Nations and have put my mind to the specific concerns identified.
- The potential rights and title of First Nations in the Merritt TSA introduces uncertainty into my determination. I recognize that there is the potential for aboriginal rights and title to exist somewhere within the Merritt Timber Supply Area.

My authority as the decision maker under Section 59.1 enables me only to award an increase in allowable annual cut on the licences of innovative forestry practice agreement holders. I cannot award direct harvest volume to other forms of tenure. However, legislation does allow me to make various conditions on innovative forestry practice agreement holders if the licensees wish to access the awarded allowable annual cut. I recognize that such conditions can be used as a tool to accommodate aboriginal interests, where appropriate, but that such a tool needs to be used responsibly.

My accommodation of aboriginal interests for this decision, and rationalization of such, is as follows.

I feel that my decision provides indirect economic benefits to the eight bands involved with Stuwix Resources Ltd. If I were to follow the proposed share agreement that follows the current allocation Stuwix Resources Ltd. would receive about 55% of the allowable annual cut increase. This level reflects previous decisions made by the regional manager that provided more than the original share agreement suggestion of 50% of the allowable annual cut increase.

The Ministry of Forests and Range has and will continue to negotiate Interim Agreements on Forest and Range Opportunities and, where applicable, Mountain Pine Beetle Agreements to address economic accommodation matters. These agreements, between the Ministry of Forests and Range and eligible First Nations, are designed to provide for "workable accommodation" of aboriginal interests that may be impacted by forestry decisions during the term of the agreement, until such time as those interests are resolved through treaty. These agreements provide the Ministry with operational stability and assist First Nations to achieve their economic objectives by providing revenue and direct award of timber tenure. I note that five First Nations with interests in the Merritt TSA have entered into accommodation agreements.

First Nations have previously identified to me the need to have appropriate information, resources and tools to be able to be involved with operational decisions within their areas of interest and related traditional use. I recognize that within the current Forestry Plan the society identifies a need around traditional use information, and that the society's vision in part states "NSIFS uses innovative forestry management practices that incorporate Aboriginal knowledge and values and public involvement in order to increase the productivity of a healthy and resilient working forest."

In the July 2005 rationale I had requested that IFPA-holders provide a budget showing how the society will fund the collection, analysis, and modelling of traditional use information necessary for forest management planning within the area to be harvested under the beetle management strategy. NSIFS provided such a budget and project information on September 30, 2005. As it is important that First Nations continue to be aware of the work of NSIFS, I request in my conditions that NSIFS provide annually an update to this document and make it available to First Nations in the Merritt TSA.

As a result of the July 2005 allowable annual cut increase decision, the Ministry has provided monies to Upper Nicola Indian Band and NSIFS. For future fiscal years, I desire, subject to approval of funding, to continue to provide funding at a level of \$30 000 per year. However, as the Mountain pine beetle infestation has spread geographically, I recognize that needs also may change. As such rather than direct how such monies are used and by whom, I will consider a proposal for the use of such monies that is coordinated through NSIFS but agreed to by First Nations with interest in the Merritt TSA.

Stoyoma Mountain has been consistently identified by First Nations as a sacred mountain. However, government has not specifically recognized this area through legislative protection. As discussed under my “Guiding Principles”, it is inappropriate for me to attempt to speculate on the impacts on timber supply that may result from decisions that have not yet been made by government or to fetter other statutory decision-making authorities. However, as in my previous decision, I find it reasonable that within the scope of my decision that I set out as a condition that the IFPA-holders shall involve First Nations to a very high degree where requested in the planning and harvest monitoring on Stoyoma Mountain. Further, licensees are encouraged to communicate any plans to harvest on Stoyoma Mountain with the District Manager in order that the district may work proactively with the licensees and First Nations on the planning phases.

It is important that NSIFS continue to meet their objective to “ensure First Nation’s role in the management of the NSIFS”. To do so, requires that First Nations are aware of and involved in the operations of the society. The structure of the society has provided opportunities for many First Nations to be involved. However, especially for First Nations without direct involvement, on going communication about the society’s program and operations is necessary.

Through the above, I have attempted within my authority and understanding, to fairly accommodate First Nations for potential infringement in relation to my current decision. I am mindful that my decision is one in a line of decisions by government related to the eventual harvesting in the Merritt Timber Supply Area, particularly as related to areas infested by Mountain pine beetle. It is through this rationale that I make known my considerations with regard to accommodation of aboriginal interests that have been made known through the consultation process.

If information becomes available during the term of this allowable annual cut increase that concerns potential rights and title of First Nations in the Merritt TSA, I may re-visit this determination.

The allowable annual cut increase that I determine should not in any way be construed as limiting obligations under recent decisions by the British Columbia Court of Appeal or the Supreme Court of Canada. My determination does not prescribe a particular plan of harvesting activity within the Merritt TSA and does not affect consultation obligations with respect to referrals on harvest operations.

Reasons for Decision

In reaching my decision on a request for an increase in allowable annual cut to the forest licences held by the IFPA-holders, I have considered all of the factors presented to me, and I have reasoned as follows.

An increase in allowable annual cut is based upon the increment in short-term harvest flow attributable to the innovative forestry practices and activities. These innovative forestry practices and activities are identified in the forestry plan that I have previously approved, and have been, or will be carried out, by the IFPA-holders in accordance with the forestry plan. In the previous section, I have discussed my current concerns around specific innovative forestry practices.

I am in agreement with my previous decision around the acceptability of specific practices and activities as described in my July 13, 2005 rationale for improvements in information around forest inventory, site productivity, single tree selection, stream classification, landscape biodiversity, and deer winter range. I also continue to support the IFPA-holder's strategy and activities related to the current Mountain pine beetle infestation as an innovative forestry practice. While the strategy has not been able to meet initial expectations identified by NSIFS's projections, I recognize that the strategy and performance are meeting the underlying objective of reducing future merchantable volume losses through locally slowing the infestation spread and accessing impacted stands in a timely and strategic manner. I find that NSIFS Mountain pine beetle practices are likely to increase the amount of timber available to harvest than the amount that would have been available under practice that was standard previously.

Section 59.1 of the *Forest Act* requires that I justify an increase in allowable annual cut based on timber supply analysis methodology approved by the chief forester. The chief forester, in his timber supply analysis considerations for IFPAs, identifies the types of information that should be included in an analysis. This includes information around land base, inventory, growth and yield, and management objectives. This methodology also recognizes the need to consider operational feasibility, harvest flow patterns, consistency with legislation and policy, and the reflection of current and reasonably foreseeable practices.

The analysis supporting this application has 3 origins: the 2003 IFPA timber supply analysis, the 2005 MFR mountain pine beetle analysis, and 2007 IFPA scenarios based on the 2007 Enhanced Type 2 Silviculture Strategy Analysis. I have reviewed factors related to the land base and inventory, growth and yield, and management objectives and I am satisfied that the majority of the assumptions appropriately reflect the best available information and current practices. I have identified a number of forest management or data issues that either cause uncertainty or lead to changes in analysis assumptions relative to the analysis. Some of these factors can be quantified and their impacts assessed with dependability. Other factors may influence the timber supply by adding an element of risk or uncertainty to the decision but cannot be reliably quantified at the time of this determination. Some of these factors may favour an allowable annual cut increase while others may not.

Having reviewed my July 2005 rationale in light of the information presented, I am in concurrence with my previous reasons on identifying an allowable annual cut increase level based on the 2003 IFPA analysis and 2005 MFR mountain pine beetle analysis and I will not repeat those reasons here. The analysis for the 2007 IFPA scenarios, while

indicating a less optimistic mid-term timber supply under the status quo, does not cause me to deviate from the increase level of my previous decision.

I continue to have concerns around the application of the VRI phase 2 inventory. My risk of accepting identified harvest flow increases due to the phase 2 inventory is likely small as the Mountain pine beetle issue overwhelms short-term timber supply availability. For this decision, I am willing to accept the level of harvest flow increases for improved inventory information identified in my previous decision and to recognize that the innovative forestry practices for mountain pine beetle and the related harvest priorities overlap on such an increase. However, given the uncertainty around the application of the Phase 2 inventory and the rapid changes in forest inventory due to Mountain pine beetle, I am not willing to recognize identified gains beyond the short term.

In making allowable annual cut increase determinations, and particularly given the impacts on all forest values which may result from the current Mountain pine beetle infestation, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act*, and of my responsibilities under the *Forest Practices Code Act of BC* and the *Forest and Range Practices Act*.

In summary, I am satisfied that the information provided with the application is sufficient upon which for me to base a decision about an allowable annual cut increase on the IFPA-holder's licences.

Determination and Conditions

I have reviewed and considered all the factors and the associated uncertainties described in this document. I determine that 830 700 cubic metres per year from within the Merritt IFPA boundaries is still attributable to the innovative forestry practices of the IFPA-holders.

With respect to assigning the increases in allowable annual cut to individual Forest Licences, the share agreement between IFPA-holders dated June 7, 2007 provides me with the basis of the assignment of the increase. As noted in my previous rationales, I am aware of the subsidiary agreements made in the past such as between Aspen Planers Ltd. and Weyerhaeuser Canada Ltd and that I do not feel obligated in this decision to consider any subsidiary agreements, other than the share agreement that I have requested.

In this decision, I will assign an allowable annual cut increase to the Forest Licences of the IFPA-holders as follows:

- A18695 - Aspen Planers Ltd. by 59 649 cubic metres per year;
- A18696 - Tolko Industries Ltd. by 118 711 cubic metres per year;
- A18697 - Tolko Industries Ltd. by 7 640 cubic metres per year;
- A18698 - Weyerhaeuser Canada Ltd. by 160 926 cubic metres per year;

A18039 - Ardeu Wood Products Ltd. by 29 369 cubic metres per year; and
A65006 - Stuwix Resources Ltd. by 454 405 cubic metres per year.

The award on each licence is subject to the conditions below:

- (1) Submission of an annual report by April 30th of each year that summarizes the activities completed by the society in the past calendar year, the expected activities in the upcoming year, how conditions of this award have been met, and any other requirements identified in the below conditions.
- (2) Continue with the development and implementation of a detailed, peer reviewed monitoring plan and submit a summary of monitoring results with the annual report. The plan components are to include:
 - growth and yield monitoring that will identify deviations from expected overall average site productivity estimates for, but not limited to, low elevation, high elevation, and smallwood stands;
 - silviculture monitoring that enables comparison of actual silviculture and harvest operations with the regimes modelled in the allowable annual cut increase application.
- (3) Identify within the annual report changes in legislation, land base composition and forest management practices that would result in changes to timber supply. This includes completion of conditions in 2005 rationale around old growth management areas and mule deer winter range. Where changes are likely to significantly impact the modelled harvest flow increases (i.e., greater than 10 000 cubic metres per year), the impacts of the innovative forestry practices should be re-assessed by updated timber supply analysis.
- (4) Update as necessary the report describing the Mountain pine beetle strategy that (a) describes the co-ordinated beetle response and management strategy to be used by IFPA-holders, (b) methodology and schedule for forecasting beetle spread, (c) identifies biodiversity features at risk due to beetle spread or increased harvest associated with beetle management, and the recommended actions to mitigate threats, and (d) describes the strategy for a “roads ahead program”. This report with updates is to be provided annually by January 31.
- (5) Report annually by January 31 on the beetle management strategy and activities for the previous fiscal year. This report will include harvest activities, past and future projections of beetle spread, current beetle spread as identified from surveys, operational plans for next fiscal year.
- (6) Report how the awarded volume was distributed to holders through secondary agreements and identify the direct benefits to First Nations. This will include tracking and summarizing First Nation employment in relation to commitments made within forestry plans and within the Jobs Plan identified in the April 2, 2001

share agreement. This information should be submitted with the April 30th annual report.

- (7) Inform affected First Nations (Indian Bands) on a quarterly basis about the location of proposed and current harvesting, the status of the beetle infestation, how First Nations are being involved in the planning process in order to incorporate their interests, any harvesting economic opportunities available to First Nations, and on an annual basis about the general administration and operations of the society. Copies of the above communications updates will be filed annually with the April 30th annual report.
- (8) Involve First Nations to a very high degree in the planning and harvest monitoring for the Stoyoma Mountain area.
- (9) Provide to the MFR and First Nations with interest in the Merritt TSA, a budget approved by the society that details how NSIFS will fund the collection and use of traditional use information within their cultural value models and management. This budget for the 2007/2008 fiscal year should be provided within 8 weeks of this decision. In future years, this budget should be provided with the April annual report. Additionally, the NSIFS must deliver a detailed plan that identifies specifics around this budget. Details are to include: (a) study description, (b) area of study, (c) methodology, (d) timelines, (e) budget, (f) confidentiality/information sharing agreements, (g) how the information gathered will be used in planning to effectively address First Nations interests, and (h) how the information gathered will be catalogued. This plan is to be provided initially within 6 months of this decision and thereafter with the April annual report.
- (10) Submit a proposal for the hiring of a First Nations Liaison person. The First Nations Liaison person would communicate with potentially affected First Nations in the Merritt TSA on proposed harvesting, the status of beetle infestations, and identify economic opportunities. The First Nations Liaison person would also assist First Nations involvement in the planning process and assist with the administration of traditional use data collection. The ministry will consider entering into an agreement with the NSIFS to provided up to \$30 000 annually, subject to availability of funding, over the duration of the allowable annual cut increase to support this proposal. The proposal submitted by NSIFS would require the support of First Nations and must be submitted no later than December 31 in order to be funded the following fiscal year.

This determination is effective July 31, 2007 and will remain in effect until August 31, 2011, the date at which the innovative forestry practices agreements expire. I note that I am prepared to reduce the allowable annual cut increase awarded if I find information or assumptions upon which this decision is based are not justified or that conditions of this decision have not been met.

This rationale and the society's May 7, 2007 application is an integral part of the Nicola-Similkameen Innovative Forestry Society Forestry Plan and should be attached hereto.

Recommendations

The review of information in support of an allowable annual cut increase determination provides me with the opportunity to look at the forest management practices and information needs of the Merritt TSA. In the rationales of the two previous determinations a number of recommendations were made with which I still concur. I identify the following recommendations to the IFPA-holders that relate specifically to the discussion within the current rationale:

- Initiate and complete projects that result in the greater integration of First Nation's values and land uses and where appropriate incorporate into future timber supply analyses;
- Communicate any plans to harvest on Stoyoma Mountain as soon as possible to the District Manager, and to work proactively with the forest district and First Nations during the planning phases;
- Involve as appropriate, all First Nations with interest in the Merritt TSA in a meaningful manner within the society's operations.
- Continue to improve the forest inventory and site productivity estimates within the IFPA area;
- Create a new forest estate analysis that uses updated information around forest inventory, site productivity, landscape and stand level biodiversity, wildlife habitat, traditional use values and other resources in order to better assess current management and the innovative forestry practices.
- Continue to improve knowledge of the current Mountain pine beetle infestation and the society's management strategy with consideration to the chief forester's forest stewardship guidance and retention planning.

Yours Truly,



T.P. (Phil) Zacharatos, R.P.F.
Regional Manager
Southern Interior Forest Region

August 2, 2007

Appendix 1: Section 59.1 of Forest Act

Innovative forestry practices 59.1

- (1) For the purpose of improving the productivity of the forestry resource, the minister, at his or her discretion, may enter into an agreement with a person referred to in subsection (2) to allow that person to carry out, subject to subsection (5) and the *Forest and Range Practices Act*, one or more of the innovative forestry practices and other activities that are set out in a regulation made under subsection (4).
- (2) For the purposes of subsection (1), the minister may enter into an agreement with a person who
 - (a) is the holder of a forest licence or other agreement that is entered into under section 12 and specified in a regulation made under subsection (4) of this section, and
 - (b) presents a written proposal for an agreement to the minister.
- (3) An agreement under subsection (1) (a) must be for a term not exceeding 15 years, and (b) may include terms and conditions that (i) the minister considers are necessary to effectively carry out the purpose of the agreement and further the social and economic objectives of the government, and (ii) are consistent with this Act and the regulations and the *Forest and Range Practices Act*, and the regulations and standards made under that Act.
- (4) The Lieutenant Governor in Council may make regulations specifying (a) the innovative forestry practices and other activities that may be the subject of an agreement referred to in subsection (1), and (b) the agreements entered into under section 12, the holders of which may enter into an agreement with the minister under subsection (1) of this section.
- (5) A person may only carry out an innovative forestry practice or other activity referred to in subsection (1) if the person (a) has prepared and obtained the regional manager's approval of a forestry plan that meets the requirements of subsection (6), and (b) is carrying out the practice or activity in accordance with the plan.
- (6) A forestry plan (a) must contain a description of the management area where the innovative forestry practices or other activities will be carried out, (b) must specify the particulars of the innovative forestry practices or other activities, (c) must contain a description of how the innovative forestry practices or other activities will be carried out, (d) must contain a schedule of when the innovative forestry practices or other activities will be carried out, (e) must specify how the innovative forestry practices or other activities will contribute to improved productivity of the forestry resource, (f) must specify how the innovative forestry practices or other activities will justify an increase in the allowable annual cut of the participant's licence or agreement referred to in subsection (2) (a), and (g) may include other terms and conditions that (i) the regional manager believes are necessary to effectively carry out the agreement referred to in subsection (1), and (ii) are consistent with this Act and the regulations and the *Forest and Range Practices Act*, and the regulations and standards made under that Act.
- (7) After approving a person's forestry plan, the regional manager may increase the allowable annual cut authorized in the person's licence or agreement referred to in subsection (2) (a) by an amount that is justified according to timber supply analysis methodology approved by the chief forester or the chief forester's designate.
- (8) When the regional manager increases an allowable annual cut under subsection (7), the regional manager may limit the increase to a period of time, area of land and type of timber, and may make the increase subject to conditions.
- (9) If an assessment of (a) the innovative forestry practices or other activities being carried out under the forestry plan, or (b) information that was not available at the time the regional manager increased the

allowable annual cut under subsection (7) indicates that all or part of the allowable annual cut increase was not justified, the regional manager may reduce the allowable annual cut of the licence or agreement referred to in subsection (2) (a) by an amount not exceeding the increase granted under subsection (7).

- (10) If, with respect to an innovative forestry practice or other activity, a person is not complying with (a) the agreement referred to in subsection (1), (b) the forestry plan approved under subsection (5), (c) any limitation or conditions imposed under subsection (8), or (d) this Act and the regulations made under this Act, or the *Forest and Range Practices Act* and the regulations or standards made under that Act, the regional manager may do one or both of the following: (e) suspend or cancel the agreement referred to in subsection (1) and sections 76 and 77 apply with respect to that suspension or cancellation; (f) reduce the allowable annual cut of the person's licence or agreement referred to in subsection (2) (a) by an amount the regional manager determines is attributable to the default.
- (11) A reduction under subsection (9) or (10) may be apportioned over a period of up to 5 years.
- (12) If the forest licence, or other agreement referred to in subsection (2) (a), is suspended, the agreement under subsection (1) is suspended.
- (13) If the forest licence, or other agreement referred to in subsection (2) (a), is cancelled or surrendered, the agreement under subsection (1) is cancelled.
- (14) If the agreement referred to in subsection (1) is suspended or cancelled, the forestry plan is suspended or cancelled, as the case may be.

Appendix 2: Innovative forestry practices regulation

B.C. Reg. 197/97, O.C. 0694/97 - Deposited June 18, 1997
Consolidated to August 5, 2003

1. Definitions
2. Authorized innovative forestry practices and activities
3. Authorized forms of agreement

Definitions

1. In this regulation:

"**Act**" means the *Forest Act*;

"**forestry plan**" means a forestry plan required to be submitted for approval under section 59.1(5) of the Act;

"**forest practice**" has the same meaning as in the *Forest Practices Code of British Columbia Act*;

"**free-growing stand**" has the same meaning as in the *Forest Practices Code of British Columbia Act*;

"**holder**" means a person that presents a written proposal for an agreement under section 59.1(2)(b) of the Act;

"**permanent access structure**" has the same meaning as in the *Forest Practices Code of British Columbia Act*;

"**standard practices**" means the forest practices routinely applied by licensees in the timber supply area when the forestry plan is submitted or at any other time determined by the regional manager;

"**stocking requirements**" has the same meaning as in section 1 (1) of the Operational and Site Planning Regulation, B.C. Reg. 107/98.

Authorized innovative forestry practices and activities

2. The innovative forestry practices and other activities that may be the subject of an agreement under section 59.1(1) of the Act are the following:

- (a) the implementation of harvesting methods or silvicultural systems that may

(i) increase the total amount of timber available to harvest in the timber supply area over the amount available under standard practices, or

(ii) reduce the loss of productivity associated with permanent access structures from the loss of productivity under standard practices for similar terrain and timber types in the timber supply area;

(b) activities that result in the establishment of free-growing stands on

(i) previously unforested areas,

(ii) areas that are below stocking requirements and are not part of the holder's free-growing responsibilities under section 69.1 (3) and 70(3) of the *Forest Practices Code of British Columbia Act*, or

(iii) areas that

(A) have stands of timber with repressed growth or that contain brush or species that are not commercially valuable, and

(B) are not part of the holder's free-growing responsibilities under section 69.1 (3) and 70 (3) of the *Forest Practices Code of British Columbia Act*;

(c) silviculture treatments on free-growing stands;

(d) silviculture treatments on sites that are not free growing in order to produce stands that exceed current growth performance or standards achieved using standard practices for the timber supply area;

(e) the collection and analysis of new data, in accordance with the specifications of the chief forester, to provide a more accurate representation of the forest composition and its expected rate of growth compared to the rate existing when the forest plan is submitted or at any other time determined by the regional manager;

(f) activities that will enhance and protect other resource values, including, but not limited to, water, fisheries, wildlife, biological diversity, soil productivity and stability, forage production, grazing and recreation values.

Authorized forms of agreement

3. The holders of the following agreements under section 12 of the Act may enter into an agreement under section 59.1 of the Act:

(a) replaceable forest licences, and

(b) replaceable timber sale licences with an allowable annual cut greater than 10 000 cubic metres.

Appendix 3: Memorandum from chief forester on timber supply methodology



Ministry of
Forests

Chief Forester

MEMORANDUM

File: 19500-01/IFPA

April 6, 2001

To: Regional Managers

From: Larry Pedersen
Chief Forester

Re: Timber Supply Analysis Methodology Related to Innovative Forest Practices Agreements (IFPAs)

I am certain you are aware that the *Forest Act*, section 59.1, gives regional managers the responsibility for determining if increases in allowable annual cuts (AACs) for IFPA holders are justified. The *Act* requires regional managers to make their judgements according to a timber supply analysis methodology approved by the Chief Forester or the Chief Forester's designate. Attached to this memorandum is a timber supply analysis methodology to fulfill my responsibility under section 59.1 of the *Act*.

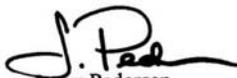


The methodology covers general analytical issues related to information needs, analysis outputs, links between AACs for IFPAs and TSAs, harvest flow, AAC increases, and legislation and policy. The method does not dictate the types of innovative practices that should or may be considered appropriate for approval as part of forestry plans, or for justifying AAC increases. Approval of forestry plans is clearly the regional managers' responsibility under the *Act*. Further, I believe that information and practices must be evaluated on their own merits within specific contexts; hence it would not be reasonable for me to prescribe evaluative criteria.

In the end, regional managers must make their own determinations based on analysis that provides insight on the full range of relevant factors, including the important risks and uncertainties. The analysis methodology is designed to assist in this undertaking.

Timber supply analysis methodology – IFPAs
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The methodology should be included as an appendix to the Forestry Plan Outline to ensure the approach is clear to all government staff and external stakeholders. Please contact Chris Fletcher of Timber Supply Branch (250-356-5959, Chris.Fletcher@gems8.gov.bc.ca) with comments or concerns.


Larry Pedersen
Chief Forester

Attachment: Timber Supply Analysis Considerations for Innovative Practices Agreements

cc: Gary Townsend, Director, Timber Supply Branch
Ralph Archibald, Director, Forest Practices Branch
Henry Benskin, Director, Research Branch
Dave Gilbert, Director, Resources Inventory Branch
Dale Draper, Director, Tree Improvement Branch
Jim Langridge, Director, Resource Tenures and Engineering Branch
Drew Brazier, Resource Tenures and Engineering Branch

Timber Supply Analysis Considerations for Innovative Forest Practices Agreements

Section 59.1 (7) of the *Forest Act* allows regional managers, after approving an IFPA forestry plan, to increase the allowable annual cut of the holder's forest licence by an amount that is justified according to a timber supply analysis method approved by the chief forester or the chief forester's designate. The following discussion outlines the timber supply analysis method and allowable annual cut decision principles used by the chief forester.

The focus is on components and principles of timber supply analysis that are crucial in gaining an understanding of factors that determine timber supply in an area. Because of the complexities involved in determining harvest levels, it is not possible to develop precise procedures or simple calculations for timber supply analysis. The process can be guided by general principles—which are outlined below—however, the detailed aspects must be developed using case specific professional judgement. In this light, the following ideas are provided as guidance, not as firm procedural requirements that must be followed in all cases. While the general ideas apply in almost all cases, each case must be viewed as unique: some cases may require additional analysis to that outlined, while others may be assessed satisfactorily with less detail than suggested here.

If a timber supply analysis incorporates the types of information noted below, and facilitates evaluation of the considerations discussed, it will have followed a timber supply analysis method supported by the chief forester.

The chief forester's task under the *Forest Act* is to provide an analysis method, not to evaluate, or provide a method for evaluating information quality. Hence, the discussion here does not address information quality, rather it focuses on an analytical method. Nevertheless, the results of any analysis depend heavily on the quality of the information used in the analysis; that is, information about the forest land base, growth and yield, and management objectives. Evaluation of information quality must be done on a case-specific basis, which regional managers, in their evaluation of IFPA analyses, are best positioned to do.

Analysis should consist of clear descriptions of issues, information sources, assumptions, and any relevant data manipulations or adjustments related to the following three categories:

Land base:

- A tabular description of the categories of land and forest that are excluded from the timber harvesting land base, and the area excluded in each category. Such tabular descriptions are included in all timber supply analysis reports published for TSAs as part of the Timber Supply Review.
- A detailed description of the criteria employed in deriving the area included in the above table. This description should follow a format similar to the Information Package for Tree Farm Licence analyses.

- A description of the composition of the timber harvesting land base and the total forested land base in terms of species, site quality, stand age, and any other features relevant in the area.

Growth and yield:

- A description of the models and methods used in generating timber yield tables for existing and regenerated stands.
- The yield tables used for each species and site quality group and silvicultural regime.
- Detailed descriptions of methods and concepts underlying site productivity estimates and yield tables that reflect any planned innovative management.
- Notice of acceptance by appropriate BC Ministry of Forests staff of site productivity or yield estimates or adjustments corresponding to both baseline and innovative practices, and of any sampling or study methods related to deriving the estimates.
- MFR, Regional Growth and Yield Foresters will coordinate the growth and yield review process.

Management objectives:

- A description of the various management objectives that apply to the area and the methods used to represent actions used to achieve the objectives (e.g., silvicultural regimes, utilization levels, seral forest cover requirements, extended “rotations,” alternative harvesting systems). The description should specify the component of the land base to which the objective applies; for example, timber harvesting land base, or Crown forested area. The template for Information Packages for Tree Farm Licence analyses provides a framework for organizing relevant information.

Analysis is facilitated if communication between relevant ministry staff and the agreement holders regarding land base, growth and yield, and management inputs occurs as early as possible in the analysis process.

Other considerations include:

Model review and benchmarking. There are no specific requirements or limitations on which analysis models may be used. However, interpretation of results and confidence that timber supply effects can be attributed to innovative practices rather than model differences requires a detailed understanding of assumptions made in the model about relevant processes and features. The best method of gaining this understanding is to benchmark the model with FSSIM, or other models used and understood by Timber Supply Branch staff. This is not to imply that FSSIM is a better model, or produces more accurate results than other models. It is simply the case that Ministry of Forests staff understands how FSSIM works, and can therefore use it as a basis for understanding how other models work. If the model to be used has not been reviewed and benchmarked by Ministry of Forests staff, the agreement holder should develop a review process in cooperation with Timber Supply Branch or a regional timber supply analyst. If the model being benchmarked produces different results from FSSIM (or other models used and understood by Timber Supply Branch staff), the agreement holder or its representative should be responsible for explaining the differences in detail in a technical document.

Even with a benchmarked model, the potential to increase harvest levels should be evaluated using the same model for both current and innovative practices. For example, a timber supply forecast corresponding to an innovative management regime and generated with a model other than FSSIM should not be compared directly to a forecast derived using FSSIM and the current management regime. Using results generated with the same model will help ensure any timber supply increase is based on management not model differences.

Results and reporting. The analysis report and related appendices should include sufficient output information to allow understanding of the main factors determining timber supply, and if applicable, reasons behind timber supply changes due to proposed innovative practices. Management, land base and growth and yield assumptions are to be documented in an Information Package. The timber supply analysis should demonstrate how these assumptions affect timber supply. The outputs should allow for examination of all relevant forest management objectives; for example, areas in seral stages by landscape unit, or area achieving visually effective green-up in visual management zones. Outputs related to timber inventory levels, areas and average volumes harvested, average age of harvested stands, and age class distributions over time all assist in understanding timber supply dynamics and evaluating the feasibility and realism of analysis results.

Sensitivity analysis. The analysis report must include results of sensitivity analyses that examine a reasonable range of uncertainty around management, land base and growth and yield assumptions and proposed innovative practices. The implications of changes in available funding to undertake planned innovative practice may be an important consideration for sensitivity analysis.

Operational feasibility. The analysis should examine any issues that may affect the operational feasibility of harvesting at the levels indicated. The most common issue involves the ability to locate harvest opportunities spatially.

Interactions between IFPA area and the TSA. IFPA timber supply analysis should demonstrate that any harvest level increases related to IFPAs will not disadvantage timber supply at the TSA level, or timber supply available to other operators in the TSA. An IFPA area may not be representative of the forest and management conditions for the TSA, and hence analysis results for the IFPA area should not be extrapolated and assumed to apply to the whole TSA.

Administration of IFPAs is the purview of the regional manager, and it is the regional manager's prerogative to require or request any analysis that s/he believes will assist in clarifying matters regarding IFPA AACs. It may be appropriate to investigate, using timber supply analysis, the advantages and disadvantages of different approaches to administering timber supply in the IFPA in the context of the TSA. For example, benefits may be gained by administering timber supply flexibly at the TSA level (e.g., allowing for harvesting of an IFPA increase from throughout the TSA not only the IFPA area) rather than combining timber supplies that have been assessed separately for spatial sub-units of the TSA. Ultimately, the regional manager will decide on the administrative

approach, and the analysis must be consistent with that approach.

The intent here is to highlight that analysis must show that timber supply benefits for IFPAs will not come at the cost of supply at the TSA level or other operators in the area.

Harvest flow. Timber supply forecasts employing assumptions/estimates of both current and proposed innovative practices must follow reasonable flow patterns over time. In general, a reasonable flow pattern provides for a controlled and gradual transition from short-term to medium- and long-term harvests, and avoids large and abrupt disruptions in supply. Considerations include: rate of harvest level decline if any is necessary; the degree to which mid-term timber supply may appropriately drop below the long-term sustainable harvest level; and the timing of increase to the long-term sustainable timber supply if it is higher than mid-term levels.

A difference between mid-term and long-term levels may be justified because mid-term supply depends more on the existing stock of timber and the timing of availability of regenerated stands, while long-term timber supply is based on timber growth which is affected by site productivity and forest management practices. Maintaining mid-term levels above or equal to the long-term level could in some circumstances delay the achievement of, or lead to failure to achieve the maximum long-term level, or cause timber supply disruptions, because of limited supply of existing timber. Likewise, a decline in timber supply from a higher short-term supply to a lower mid-term may be appropriate if it can be shown that the associated harvests do not jeopardize or cause disruptions in long-term productivity.

The analysis should include different harvest flows that examine each of these considerations. A "base case" harvest flow for current practices must be chosen from the range of possibilities. The choice should be explained. In most cases this explanation can be brief, and consist primarily of reference to alternative harvest flow patterns. The IFPA base case harvest flow should reflect that used in the Timber Supply Review base case, if relevant. This will ensure that any change in short-term timber supply is due to changes in management, not harvest flow.

The analysis report should describe the criteria used to determine:

- the long-term harvest level and growing stock (criteria for sustainability);
- the harvest flow (e.g., maintain current harvest level for as long as possible, maximize volume harvested over a specified time frame, control the rate of decline);
- the minimum harvest level allowed in the medium term.

Allowable cut increases. Harvest forecasts for many management units in B.C. show declining timber supply over a period of decades. The general approach in cases of declining timber supply is that short-term allowable cuts are not usually increased unless there is a sound demonstrated forest management reason. This approach ensures that allowable cuts are not increased in the short term only to force reductions in the near future. There may be sound forest management reasons, such as existence of high risk of loss of stands to fire, insects or disease due to current or developing stand attributes (e.g., age or diameter distribution favourable to beetle attack, etc.).

An AAC increase in the short term should not decrease future timber supply below the

levels forecast without the increase, unless there is a documented and compelling reason to do so.

The general approach described above for TSA and TFL AAC determinations with respect to potential increases leads to some issues for IFPAs. One of the explicit aims of the IFPA initiative is to allow AAC increases for IFPA-holders. However, one stipulation of an increase is that other license holders will not be negatively affected by any AAC increases for the IFPA. In this context, important considerations in designing and interpreting an IFPA timber supply analysis would include:

- what are the forest management reasons that justify an AAC increase?
- what effects would an increase have on future timber supply?
- would a boost in AAC increase the sensitivity of future timber supply to uncertainties?
- if the forecast is for a temporary short-term increase (that is, timber supply is forecast to decline from the higher level) what actions will be taken to mitigate or avoid future socio-economic impacts? In other words: in the absence of a forest management objective for increasing the AAC, how will a temporary increase assist in strengthening the long-term role of timber harvesting and processing in the social and economic fabric of the area (capacity-building, diversification, etc.)?

Consistency with legislation and policy. The land base, growth and yield and management regime modeled in the analysis should be consistent with current legislation and policy. While the need for consistency with laws and policy is perhaps self-evident, it must be acknowledged that one of the goals of IFPAs is to move management in new directions. Therefore, it is imperative that modeling of proposed innovative management does not imply conflicts with legislation and policy. This analytical consideration differs from the approval of innovative management that is the regional manager's responsibility as part of forestry plan approval. The intent here is to highlight the need to evaluate analysis inputs and results to ensure that they do not create or imply conflicts. If a timber supply forecast is based on conflicts with designations or objectives that are the responsibility of other statutory decision makers under existing laws or policies, that forecast cannot reasonably be accepted as a basis for harvest level determination.

Relationship between chief forester (TSA) and regional manager (IFPA) determinations. The concern has been raised that AAC determinations for TSAs under Section 8 of the *Forest Act* may conflict in some way with AAC determinations for IFPAs. Communication between the chief forester and regional manager will be necessary to avoid discrepancies or conflicts regarding AAC determinations. It is not possible to generalize about the relationship between TSA AAC determinations and related to IFPAs given the diversity of timber supply conditions across the province.

A guiding principle for TSA and TFL AACs is that the determination should reflect current or reasonably foreseeable practices. Use of the preceding method and considerations should ensure that practices approved under IFPAs will constitute current or reasonably foreseeable management, and will be considered as such in TSA AAC determinations.

Documentation of decisions. Documentation of Reasons for Decision is useful to ensure the basis for the decision is clear and understandable. Further, both the regional manager and the chief forester have AAC determination responsibilities under the *Forest Act*. Reasonably detailed decision documentation, referring to the technical considerations discussed in this methods document, would help ensure consistency between regional manager and chief forester determinations, particularly when the time period between the decisions is long.