



c/o Tweedsmuir Forest Ltd.
3003 Riverview Road, Prince George, BC V2K 4Y5
Phone: (250) 564-1518 Fax: (250) 562-1518
Email: venturefc@telus.net

October 30, 2007

Bill Warner, RPF
Regional Executive Director
Northern Interior Forest Region
BC Ministry of Forests
1011 – 4th Avenue
Prince George, BC V2L 3H9

Re: Request for an Allowable Annual Cut Increase in the Morice Timber Supply Area

Dear Bill;

Members of the Morice & Lakes IFPA technical committee have met twice with regional and district staff to discuss concerns that were voiced following the submission of the Morice & Lakes Forestry Plan in January 2007. Specifically the meetings were to clarify questions related to the request in your May 2007 letter for a rationale supporting submission elements and their eligibility as innovative practices under the IFPA Regulation.

The attached Morice & Lakes IFPA Forestry Plan Supplement is intended to address that request and does so in two sections. The first section provides the rationale for the content in the January submission, and the second section presents a different but supporting rationale based upon comparisons with the recent Morice TSR III analysis and results. This supporting rationale is initially intended to provide an alternative way of looking at eligibility that avoids the necessity of a statutory decision related to the time of the Forestry Plan submission. It also can be viewed as a stand-alone rationale under section 2(e) of the IFPA Regulation.

We have also included the results of a sensitivity for secondary stand structure and have compared this to the analysis that supports the Forestry Plan. We are not making any request for a cut uplift that specifically relates to secondary stand structure, However, we felt that including this comparison in the submission supplement provides better information and reduces the uncertainty of how the harvest rule in the forestry plan analysis may impact secondary stand structure and volume flows in the mid term.

While we feel that the initially submitted innovative practices are eligible on their own, the TSR III comparison eliminates the question of timing as the TSR III analysis and discussion paper were not completed at the time of the Forestry Plan submission. It is our hope that you will consider the rationale put forth in both sections in your Section 59.1 AAC decision.

Please contact me if you have any further questions or concerns.

Sincerely,
Morice and Lakes IFPA

A handwritten signature in black ink, appearing to read "Jim Burbee".

Jim Burbee, RPF
Morice & Lakes IFPA General Manager

Response to May 14 2007 Rationale Request

A Forestry Plan and accompanying letter of request for an AAC uplift were submitted to the Regional Executive Director in January 2007. Regional staff reviewed this submission, identified concerns and the Regional Executive Director subsequently requested a rationale to address specific concerns. Discussion with regional staff revealed that it may be more appropriate to benchmark innovative activities against TSR III than against the base case used in the forestry plan submission. Members of the Morice & Lakes IFPA technical committee have met twice with district and/or regional staff to clarify questions related to the request for a rationale supporting submission elements and their eligibility as innovative practices under the IFPA Regulation.

This supplement provides rationale for comparisons of the forestry plan information, analysis and results to those of both the Current Status modified for MPB & LRMP scenario and TSR III. While a rationale is provided for considering the initial forestry plan elements innovative practices for the purpose of the IFPA regulation, the TSR III comparison rationale eliminates the question of timing as the TSR III analysis and discussion paper were not completed at the time of the Forestry Plan submission. It is our hope that all of the rationale put forth in this supplement will be considered in Section 59.1 AAC decisions.

Rationale for Benchmarking Against Current Status with LRMP and MPB Scenario

Section 2(a): implementation silviculture systems

The initial forestry plan submission makes requests under section 2(a) that deals with the implementation of harvesting methods & silviculture systems relative to innovative practices. The concern is that innovative practices have two potential definitions; those not in place at the time of the forestry plan submission, or those practices not in place at a time determined by the regional manager. The regulation provides no guidance as to which definition should take precedent. Presumably a regional manager could choose either definition if it was felt that the practice was beneficial and that the proponent had a role in seeing that it was implemented. A rationale was requested for selecting TSR II as the time reference point. This is actually defined in the forestry plan as the Current Status with LRMP Scenario, which was selected as the base case for Morice analysis and is not synonymous with TSR II.

The rationale for using the IFPA Current Status Scenario management practices as base case in time for 2(a) is that while some practices may have existed in some form on a voluntary basis prior to the forestry plan submission date there is no commitment to continue. Table 1 on page six in the submitted Forestry Plan outlines the elements put forth for consideration by the statutory decision maker. Section 2(a) was applied to elements four (planting revised species mix) and five (recognition of genetic worth consistent with Forest Genetics Council (FGC) species plans). In this forestry plan commitments are made to target a species mix in planting that will enhance midterm timber supply, and to produce increasingly improved seed according to the FGC species plans that will also increase midterm timber supply. This fact takes these practices to a new level not previously established and provides the rationale for classifying them as innovative practices.

Element 4

Element four clearly meets the definition of an innovative practice by either definition as it was not even a voluntary practice at the time of the forestry plan submission. The current practice of favouring pine in plantations is based upon regeneration performance to free growing rather than volume yield in the longer term. Spruce growth exceeds that of pine in the thrifty mature plantation stage and by shifting from the existing species balance to one more heavily weighted to spruce results in a positive allowable cut effect. This is particularly true, in cases where prompt reforestation of accelerated mountain pine beetle salvage operations will result in an age class bulge. This allowable cut effect is amplified by the fact that spruce seed is currently more abundant and of higher genetic gain than pine seed.

Element 5

The rationale for using 2(a) in the case of element five is that companies voluntarily established their own seed orchards and are growing and using seed of increasingly greater genetic worth. This practice could be dropped at any time which has happened elsewhere in the province and is threatening to happen again due to cost cutting measures. Licensees make a commitment to continue this practice in the forestry plan and that is the rationale for considering it an innovative practice.

In retrospect element five may fit better under 2(e) where it can be recognized as collection and analysis of new information. Timber supply analyses to date have only recognized genetic worth of existing seed or seedlings that are planted, while the IFPA analysis recognizes seed from seed orchards that are established or are part of the FGC orchard expansion program. The forestry plan analysis incorporates increases in both class A seed supply and genetic gain according to FG C species plans that are based upon progeny tested parent stock in seed orchards. Table 2a on page 15 documents the levels of class A seed planting and the genetic worth of those plantations. This is not perceived as a standard practice as not all companies grow their own seed, nor have previous analyses included future gains in seed supply and genetic worth from progeny tested orchard stock. The rationale for including these gains is that it is similar to projecting growth of trees in the forest and projecting class A seed parameters carries less risk for decision maker than projecting a natural forest inventory file over long time horizons. Companies are involved with the FGC through supplying seed and orchard information, participating in the FGC planning process, voluntarily improving orchards, growing improved seed (at their own cost), and planting seedlings from genetically selected seed on crown land. We feel that recognizing this in a timber supply analysis is new and qualifies as an innovative practice. The innovative practice issue raised in the forestry plan review letter was not anticipated, however, this practice is clearly eligible under 2(e) and can be placed there if it remains an issue in the regional manager's mind.

Section 2(e): collection & analysis of new information

The initial forestry plan submission makes requests under section 2(e) that deals with the collection and analysis of new data to provide a more accurate representation of forest composition, again with the same two time parameters for innovative practices; those not in place at the time of the forestry plan submission, or those practices not in place at a time determined by the regional manager. Again, the regulation provides no guidance as to which definition should take precedent.

The rationale for using the IFPA Current Status Scenario management practices as base case in the section 59.1 AAC request is that while certain practices may have existed in some form prior to either the current status establishment time or the forestry plan submission date they had not yet been quantified and used in a Morice TSA timber supply review prior to this forestry plan analysis. Section 2(e) is different than 2(a) in that it relies upon collection and use of new information and it is impossible to collect information on a practice that hasn't been implemented. The existence of a practice prior to plan submission does not disqualify its impact from consideration under section 2(e). The IFPA has undertaken numerous studies to quantify parameters that can be used in analysis models, has used much of that information in the forestry plan analysis, and has put forth the most significant results as part of this AAC request.

Element 1

Elements one (OAF1), two (SI enhancements), three (utilization to a 15 cm stump height) and six (implementation of MPB harvest rule) best align with this rationale although there is eligibility overlap with section 2(a) in the case of element three and six. Element five (use of future genetically improved seed) can also be considered under this section of the regulation. These elements are based upon collection of new information and use in an analysis. The latest analysis prior to the forestry plan analysis & submission was TSR II and it did not include this new information which clearly qualifies these elements as innovative practices under the regulation.

The IFPA conducted an OAF1 study that is summarized in a posted report outlining OAF1 values used in the forestry plan analysis, developed a survey method and committed to use that survey method to collect OAF1 information with free growing surveys to maintain current OAF1 information for operators in the TSA. Fewer plantation gaps exist in practice than is recognized in previous analyses and as such this information better represents the rate of growth in the TSA.

Element 2

The IFPA developed and used new growth curves in the forestry plan analysis and the growth curves and their genesis is documented in number of Forest Analysis Branch approved reports. It is widely recognized that site indices are understated in conventional forest inventories and new site index information was developed specifically for this analysis to better represent rate of growth in the Morice TSA. This information was developed from a Ministry of Forests Predictive Ecosystem Mapping (PEM) product that was tested for accuracy in parallel with the development of growth curves. The accuracy assessment showed that the PEM did not meet internal statistical targets for stand alone use in determining productivity for timber supply analyses which presented a temporary problem. Ecologists that undertook the accuracy assessment felt that the productivity numbers were realistic and would not significantly change with improved accuracy, but acknowledged that the confidence in the estimates would be increased.

The fall back position was to compare Old Growth Site Index (OGSI) values to those generated using the PEM, which showed virtually no difference in site indices between approaches. As OGSI information was based upon regional information, the PEM was used as local information to confirm that the regional OGSI is realistic for use in the Morice TSA. Although not as initially planned, the PEM provided a localization of OGSI for the Morice TSA confirming the legitimacy of productivity rates used in the forestry plan analysis. This development of growth curves was documented and approved by the Forest Analysis Branch. A new Morice PEM has subsequently been completed using more current PEM modeling inputs and is currently undergoing an accuracy assessment.

Element 3

The IFPA conducted a stump height survey across BEC units and across seasons of harvest and statistically determined that a 15 cm stump height is operationally feasible in the TSA. This report is posted on the IFPA website. The results of the study indicated that increasing utilization standards (i.e, changing from a 30cm stump height to 15cm stump height) resulted in a 2% increase in volume. These results were used in the forestry plan analysis and through a plus 2% adjustment of the yield curves thereby generated higher sustainable yields on the land base. This is a clear example of collecting new information from an existing practice for use in timber supply analysis as anticipated by section 2(e).

Element 6

A multi-tiered harvest rule was derived and used in the forestry plan analysis to ensure that planned harvest areas were modeled in a manner that optimally minimized non recoverable losses to MPB and maintained the mid term timber supply of the TSA. This harvest rule is documented on page 21 of the forestry plan and companies commit to implementing this harvest priority rule in operational planning. In addition, the harvesting rule was applied to an analysis file that contained many new information enhancements which the resulting harvest flow reflects. For this reason the harvest rule is cited as element six in the forestry plan to represent the collective effort to collect and analyze new information as anticipated under sections 2(e), and to commit to implementation of supporting practices as anticipated under 2(a).

First, implementing this new harvest rule is innovative by definition as it proposes a new practice, and thus the reference to section 2(a) in table 1. The MPB mitigation harvest rule has been developed as part of the forestry plan process and has been committed to operationally for the first time in the forestry plan. Initial results show similar pine content as current harvest volumes but it does not represent the same practice nor does it produce the same harvest flow. Specific harvest criteria for pine and other species guide the harvest both during and after the anticipated accelerated MPB salvage harvesting program to meet the above objectives. The rule was

selectively applied by licensees in the TSA during the forestry plan development process, but is committed to in the forestry plan. This harvest rule has recently been tested against the TSR III harvest rule and it produces a decrease of 400,000 m³ per annum in non recoverable losses (NRLs) from the TSR III harvest rule levels for the next decade. These facts qualify implementation of and commitment to a new harvest rule as an innovative practice under section 2(a) of the regulation.

Second, the MPB Mitigation harvest rule itself is new information that has been developed specifically for and used in the forestry plan analysis. The harvest rule was used to drive the harvest scheduling model to balance the recovery of dead pine through a 1.1 million m³ AAC uplift with midterm timber supply. As such it has played a key role in determining future species composition and rate of growth of the growing stock in the TSA. The fact that this harvest rule is new and was first used in the forestry plan analysis provides a rationale for classifying this element an innovative practice under section 2(e) of the regulation.

Also, the harvesting rule was applied to an analysis file that contained many new information enhancements which the resulting harvest flow reflects and the modeled AAC for the TSA is not solely the due to the harvest rule. There is a large component of new information used in this analysis. Element six is presented in this manner in table 1 as the harvest rule best typifies the scenario that demonstrates feasibility of a 1.1 million cubic meter salvage based uplift in the TSA. Although demonstrated, this entire uplift is not requested under section 59.1 of the *Forest Act* in recognition of the demands of others in the TSA and the dispersion of risk by allocating the uplift more broadly.

The breadth of new information included in this analysis is reflected in Appendix I of the forestry plan, which is newly submitted with this supplement. This appendix highlights numerous inputs described in the information package and analysis report where new information and strategies have been incorporated into the analysis to demonstrate the magnitude of scope in refinements to conventional TSR data and information packages. It is impractical to quantify the impact of each of these contributions as there are many of them and they are often interdependent. Suffice to say that, collectively the new information and harvest strategy support a 1.1 million cubic meter AAC uplift for a decade, and that commitments to implement the management strategies and practices supporting the new information and harvest rule are made in the forestry plan.

Third, innovative analysis techniques were employed to enhance the confidence in common analyses outputs, and to model more complex management conditions. Each forest polygon is spatially tracked through the entire modeling horizon which allows for more specific management manipulation of forest information such as species distribution, site productivity, spatial constraints such as patch size and temporal constraints such as seral stages from LRMP and SFMP decisions. For example, specific spatial enhancements such as pre-blocking of the THLB while considering aspatial/spatial constraints on the land base has allowed the spatial harvest scheduling algorithms to be more effective. For example, if a VQO or habitat related constraint indicated that harvest units no larger than 1ha could be harvested within a certain region, all the harvest units within the region were created to a 1ha size to allow entry into the area. The intent of this process was to mimic the operational reality of harvesting within these constrained zones through maximum block size requirements based on the constraints on the land base. The roads were also accounted for spatially, through using a road projection model to implement a realistic road network that would identify/test access limitations and apply the road network within the analysis directly through THLB reductions. In using these innovative modeling approaches, fewer interpretive assumptions were required to be made by analysts to deal with management circumstances (e.g. % aspatial reductions to make for future road construction, future landings, etc.) that are sensitive to spatial factors, which should lead to more confidence in analysis outcomes related to those aspects. The spatial model used for the analysis was tested and approved by Forest Analysis Branch for IFPA timber supply analyses, and has marked capability improvements over aspatial timber supply models that have been conventionally used in TSR. This capability adds to the innovative nature of element six.

Element 7

The rationale for risk reduction with this element is unchanged from the initial Forestry Plan submission. Essentially, the identified cut uplift was spatially modeled within the Sustainable Forest Management (SFM) Plan framework to meet landscape pattern targets for both the SFM Plan and the Morice LRMP. This addresses uncertainty about the ability to implement this accelerated plan without undue impact on other resources. While there is no AAC request attached to this element it is an eligible activity for consideration under section 2(f) of the IFPA regulation.

Rationale for Benchmarking Against TSR III Analysis

The simple facts above were the basis for presenting the elements of table 1 in the forestry plan as innovative practices. For this reason we are somewhat surprised with the concerns raised in the May 24th letter. However, at a meeting with regional staff to clarify these concerns it was agreed that further information would be put forth comparing the forestry plan analysis (MPB-mitigation composite scenario) to TSR III outcomes. The premise for comparing these analyses is that where different, the forestry plan analysis represents “innovative practices” as defined in the regulation, and the TSR III analysis represents “standard practices” as defined in the regulation. The timing of TSR III is after the submission of the forestry plan. This will relieve the concern that was expressed about the distinction between standard practices and innovative practices in the initial forestry plan submission that are potentially based upon the date of submission of the forestry plan. This comparison provides a rationale for citing differences in outputs as being the outcome of innovative forest practices under 2(e) of the IFPA regulation.

Other aspects of this rationale are essentially the same as those described under element six above. Table 1a below outlines elements that contribute to the section 59.1 AAC uplift request in the Morice TSA using this rationale.

Table 1a. Morice IFPA AAC Elements and the Associated Volume Contributions

Element	AAC Uplift Request Legislation Reference	Planning Horizon		
		Harvest for Periods 2 & 3 (2007-2016)	Harvest for Periods 4-20 (2017-2101)	Harvest for Periods 21-35 (2102-2252)
8. Analysis with MPB Mitigation Harvest Rule	IFPA Regulation. Paragraph 2e	400,000 m ³ /yr (reduced NRLs)	-	-
9. Implementation of MPB Mitigation Harvest Rule	IFPA Regulation. Paragraph 2a	400,000 m ³ /yr reduced NRLs (non cumulative)	-	-
10. Information package	IFPA Regulation. Paragraph 2e	515,000 m ³ /yr (midterm timber supply)	515,000 m ³ /yr (midterm timber supply)	-
11. Analysis techniques	IFPA Regulation. Paragraph 2e	515,000 m ³ /yr (midterm timber supply - non cumulative)	515,000 m ³ /yr (midterm timber supply – non cumulative)	-
Uplift Subtotal for elements 8 through 13	IFPA Regulation. Paragraph 2a and 2(e)	915,000	515,000	-
12. Secondary Stand Structure Sensitivity	IFPA Regulation. Paragraph 2e	Supports 1,098,883 m ³ /yr uplift reduces risk	Supports 515,000 m ³ /yr uplift reduces risk	Supports 82,000 m ³ /yr uplift reduces risk
13. Implement accelerated harvest within existing tenure system	IFPA Regulation. Paragraph 2f	Supports 1,098,883 m ³ /yr uplift reduces risk	Supports 515,000 m ³ /yr uplift reduces risk	Supports 82,000 m ³ /yr uplift reduces risk
Uplift Totals (m³/yr) with all elements	Revised from table 1	1,098,883	515,000	82,000
IFPA requested apportionment	Revised from table 1	500,000	257,500	-

Elements 8 & 9: Analysis with MBP-mitigation harvest rule

A forestry plan sensitivity analysis was recently modeled using Tesera’s Suite of spatial planning tools including the Tesera Scheduling Model (TSM) to compare the harvest rules from the MPB mitigation composite scenario harvest rule and the TSR III harvest rule. The sensitivity involved incorporating a spatial equivalent of the TSR III harvest rule into the dataset and re-running TSM to generate the harvest flow and resulting NRLs. The only difference between the Mitigation Composite scenario and the TSR III sensitivity was the harvest rule, everything else remained the same. The specific impact of the innovative harvest rule on the amount of non recoverable losses is summarized in Figure 1a and Table 1b. A total of 4 million m³ more pine volume (400,000 per year) is lost to NRLs in the first ten years using the TSR III harvest rule.

The identical TSR III harvest rule was not used in the sensitivity analysis because in TSR III it was applied only to stratified stands with 70% or greater pine content by volume. TSR III assumed a steady state annual harvest of 885,000 cubic meters from stands with less than 70% pine content in addition to the harvest from stands greater than 70% pine content. As the IFPA data was not stratified the TSM simply prioritized the harvest of stands containing 70% or greater pine content by volume during the uplift period in the sensitivity analysis. Pine stands with less than 70% pine were second in priority queue for harvest. Within these two stand groups the relative oldest criteria (age above minimum harvest volume) was used to select stands for harvest. Results of this sensitivity were compared to the forestry plan harvest rule results that flowed from the tiered harvest rule used in the forestry plan analysis.

The forestry plan harvest rule is directly responsible for capturing an additional 4 million cubic meters of dead pine during the uplift period and as such that volume is eligible under section 2(e) of the regulation for an AAC uplift award. Companies commit to implement the harvest rule.

Figure 1a: Graphic Comparison of NRLs resulting from Harvest Rules

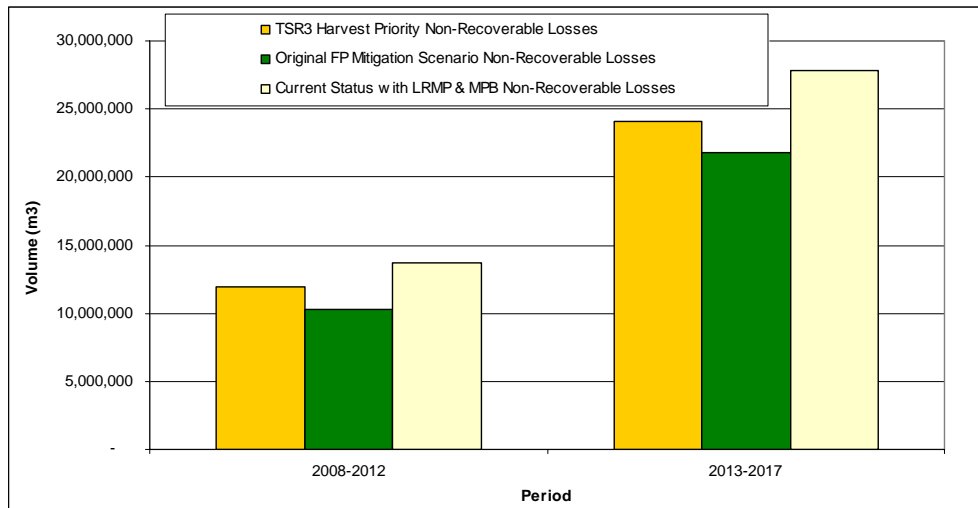


Table 1b: Tabular Comparison of NRLs resulting from Harvest Rules

		Volume Lost Due to Stands Being Under the Economic Rotation Age and Impacted by MPB	Volume Lost Due to Pine Becoming Unmerchantable (i.e. moving beyond the 5-year shelf life)	Total NRLs	Difference (Current Status with Morice LRMP & MPB - Mitigation Scenario)	Difference (Original FP Mitigation Scenario - TSR3 Harvest Priority)
Current Status with Morice LRMP & MPB (m3)	2008-2012	8,365,604	5,329,106	13,694,710		
	2013-2017	12,920,323	14,870,493	27,790,816		
	Totals	21,285,927	20,199,599	41,485,526		
Original FP Mitigation Scenario (m3)	2008-2012	5,426,325	4,857,210	10,283,535	3,411,175	
	2013-2017	8,998,499	12,755,297	21,753,796	6,037,020	
	Totals	14,424,824	17,612,507	32,037,331	9,448,195	
TSR3 Harvest Priority Sensitivity (m3)	2008-2012	5,423,211	6,549,018	11,972,229		(1,688,694)
	2013-2017	8,813,585	15,251,938	24,065,523		(2,311,728)
	Totals	14,236,796	21,800,956	36,037,752		(4,000,421)

Table 1c: Tabular Description of TSR III species groups harvested resulting from Mitigation Harvest Rule

Period Harvested	Volume Class	PineTypeGroup>=70%	Pine Volume	Non-Pine Volume	Operable Volume
2	>=400	Yes	696,776	29,792	726,567
2	300-399	No	30,199	18,142	48,341
2	300-399	Yes	3,167,177	416,952	3,584,129
2	200-299	No	976,685	690,421	1,667,106
2	200-299	Yes	3,472,129	966,729	4,438,858
2	100-199	No	1,773,901	2,335,622	4,109,524
2	100-199	Yes	193,887	67,554	261,441
2	50-99	No	30,202	88,359	118,561
2	50-99	Yes	707	145	853
2	1-49	No	2,261	14,682	16,943
2	1-49	Yes	89	18	107
2	All Other Stands	No	-	23,697	23,697
2	All Other Stands	Yes	-	-	-
Sub-Total for Period 2 where PineTypeGroup >=70% is "Yes"			7,530,765	1,481,190	9,011,955
Percent Contribution (Period 2 where PineTypeGroup >=70% is "Yes")			50%	10%	60%
Sub-Total for Period 2 where PineTypeGroup >=70% is "No"			2,813,249	3,170,922	5,984,171
Percent Contribution (Period 2 where PineTypeGroup >=70% is "No")			19%	21%	40%
Total Percentage of Volume Harvested in Period 2			69%	31%	100%
3	>=400	Yes	30,542	930	31,472
3	300-399	Yes	368,958	12,033	380,990
3	200-299	No	79,088	53,965	133,053
3	200-299	Yes	2,990,405	356,762	3,347,167
3	100-199	No	2,106,320	2,246,332	4,352,652
3	100-199	Yes	4,820,949	907,233	5,728,182
3	50-99	No	356,535	521,528	878,063
3	50-99	Yes	3,553	550	4,103
3	1-49	No	2,429	13,247	15,676
3	1-49	Yes	680	89	769
3	All Other Stands	No	-	14,341	14,341
3	All Other Stands	Yes	-	-	-
Sub-Total for Period 3 where PineTypeGroup >=70% is "Yes"			8,215,087	1,277,596	9,492,683
Percent Contribution (Period 3 where PineTypeGroup >=70% is "Yes")			55%	9%	64%
Sub-Total for Period 3 where PineTypeGroup >=70% is "No"			2,544,372	2,849,413	5,393,784
Percent Contribution (Period 3 where PineTypeGroup >=70% is "No")			17%	19%	36%
Total Percentage of Volume Harvested in Period 3			72%	28%	100%
Sub-Total for Uplift Period where PineTypeGroup >=70% is "Yes"			15,745,852	2,758,786	18,504,638
Percent Contribution (Uplift where PineTypeGroup >=70% is "Yes")			53%	9%	62%
Sub-Total for Uplift Period where PineTypeGroup >=70% is "No"			5,357,621	6,020,335	11,377,956
Percent Contribution (Uplift Period where PineTypeGroup >=70% is "No")			18%	20%	38%
Total Percentage of Volume Harvested in Uplift Period			71%	29%	100%

The intent of Table 1c is to show which TSR III stand groups are targeted by the forestry plan harvest rule during the cut uplift and the effectiveness of the harvest rule in capturing pine volume. For the duration of the ten year uplift 62% of the volume targeted is from TSR III pine stands (stands containing 70% or greater pine content) and 71% of the volume harvested is pine. The TSR III target for volume from pine stands is 70%, which can only be sustained for five years. Comparable species harvested data from the TSR III analysis is not available, but there are 885,000 cubic meters annually scheduled in TSR III from non pine stands and up to 30% non pine in the pine stands that are scheduled. Intuitively this should result in approximately the same amount of pine harvest for the five year uplift, as shown for the forestry plan harvest rule in table 1c. We believe it is safe to say that the forestry plan harvest rule meets the intent of the TSR III harvest rule with respect to focused salvage of dead and high risk pine in the Morice TSA, and that it can be expected to do so for twice as long.

Figure 1b below shows from which stand types the forestry plan harvest rule selects volume over the full term of the Mitigation Scenario analysis. The source of volume from the modeled harvest sequence has is broken down into the following stand categories; natural stands, existing managed and future managed that will be established as a result of beetle salvage harvesting. Within those categories volume is further differentiated as pine and non-pine. The intent of this graphic is to show how the harvest rule works its way through the growing stock in the analysis.

As one would expect, pine volume from natural stands is heavily exploited during the uplift period, natural non pine stands comprise the bulk of the early midterm followed by existing managed stands. Of interest is how soon the future managed stands become significant to the midterm timber supply. These stands provide half of the cut seventy years into the analysis and are the dominant volume contributor from that point forward.

Figure 1b demonstrates that the harvest rule is working as intended to maintain midterm timber supply. As well, This demonstrates the magnitude of the forest that can benefit from immediate implementation of innovative forest practices.

Figure 1b: Species Volume in Stand Types Harvested using the Mitigation Harvest Rule

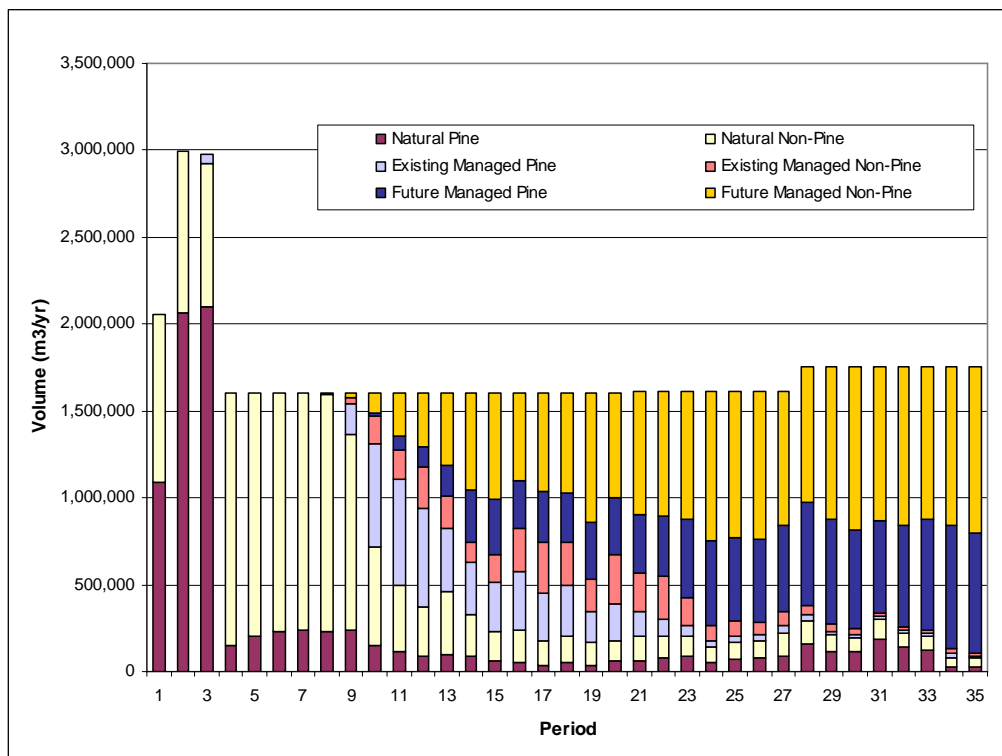


Table 1d and 1e show the tabular data used for Figure 1b.

Table 1d: Data Table of Species Volume in Stand Types Harvested using the Mitigation Harvest Rule

Period Harvested	Annual Harvested Volume (m3/yr)					
	Natural Pine	Natural Non-Pine	Future Managed Pine	Future Managed Non-Pine	Existing Managed Pine	Existing Managed Non-Pine
1	1,091,508	964,854	-	-	189	47
2	2,068,790	930,419	-	-	12	4
3	2,098,840	822,522	-	-	53,052	2,880
4	153,813	1,445,607	-	-	-	0
5	206,263	1,393,512	-	-	15	0
6	229,586	1,370,157	-	-	54	2
7	239,801	1,359,674	-	-	77	36
8	229,397	1,366,550	124	116	1,524	2,068
9	238,691	1,124,406	1,215	20,810	176,776	37,838
10	153,309	565,410	17,983	111,523	594,217	157,552
11	113,506	386,274	80,529	240,731	610,891	168,633
12	85,796	288,946	113,899	309,589	566,900	235,116
13	97,757	367,202	176,418	417,915	359,164	182,701
14	84,675	244,237	304,529	554,564	301,435	110,873
15	64,269	162,455	318,680	608,871	291,477	154,750
16	57,369	181,747	276,161	502,510	340,224	242,513
17	35,475	137,868	296,357	561,712	281,572	287,054
18	55,392	152,406	282,583	576,851	291,343	246,378
19	38,666	130,065	322,084	744,114	178,105	187,075
20	63,041	113,822	327,521	598,600	211,842	285,638
21	60,496	140,791	336,341	708,936	141,933	221,612
22	82,423	121,003	347,479	717,657	98,435	243,207
23	86,796	120,463	449,649	732,437	54,406	166,741
24	54,574	89,916	486,983	861,978	35,034	82,676
25	73,804	91,603	478,648	836,917	41,549	87,945
26	75,622	100,382	476,651	850,888	39,858	67,329
27	92,603	129,911	493,087	768,694	41,084	85,639
28	157,341	134,293	594,094	777,488	33,694	53,503
29	115,181	98,223	604,397	875,269	18,643	38,366
30	113,607	78,836	565,596	936,323	20,821	34,970
31	190,315	112,368	533,730	878,539	14,924	20,281
32	140,052	85,338	582,622	909,241	13,413	19,980
33	120,066	87,417	634,169	876,613	12,705	19,220
34	22,779	60,006	704,644	909,730	24,218	29,015
35	26,276	49,825	694,370	951,183	11,369	18,051

Table 1e: Data Table of *Species Percentage in Stand Types Harvested using the Mitigation Harvest Rule*

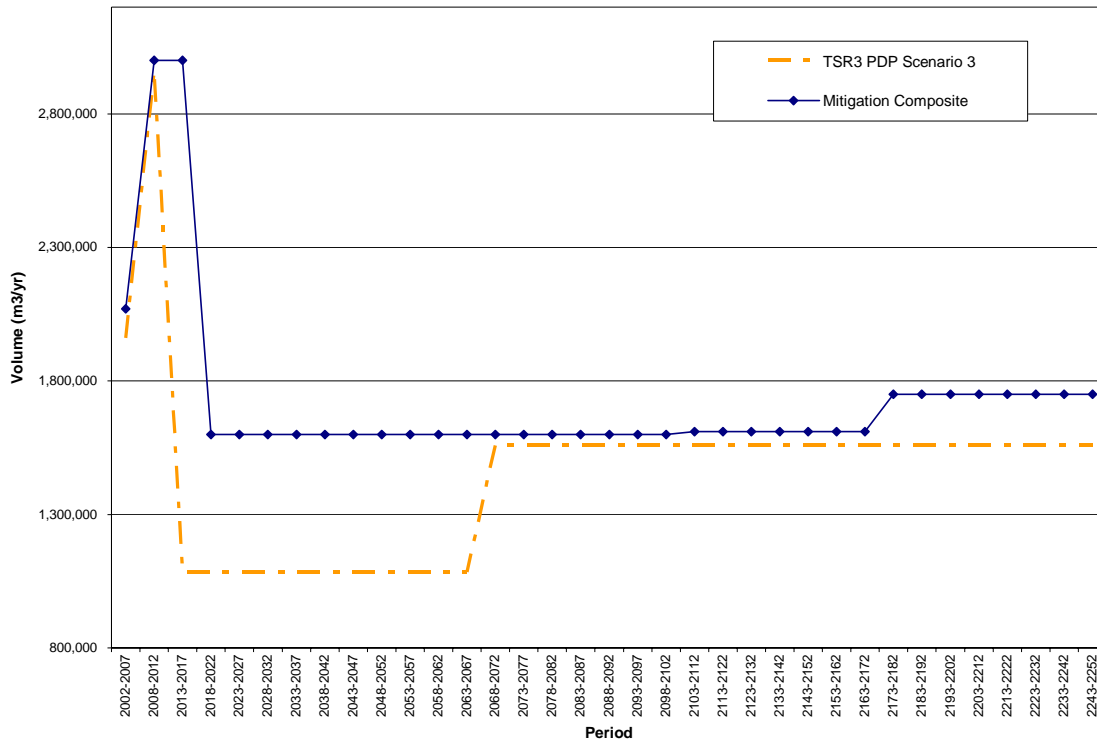
Period Harvested	Percentage of Harvested Volume (%)					
	Natural Pine	Natural Non-Pine	Future Managed Pine	Future Managed Non-Pine	Existing Managed Pine	Existing Managed Non-Pine
1	53%	47%	0%	0%	0%	0%
2	69%	31%	0%	0%	0%	0%
3	70%	28%	0%	0%	2%	0%
4	10%	90%	0%	0%	0%	0%
5	13%	87%	0%	0%	0%	0%
6	14%	86%	0%	0%	0%	0%
7	15%	85%	0%	0%	0%	0%
8	14%	85%	0%	0%	0%	0%
9	15%	70%	0%	1%	11%	2%
10	10%	35%	1%	7%	37%	10%
11	7%	24%	5%	15%	38%	11%
12	5%	18%	7%	19%	35%	15%
13	6%	23%	11%	26%	22%	11%
14	5%	15%	19%	35%	19%	7%
15	4%	10%	20%	38%	18%	10%
16	4%	11%	17%	31%	21%	15%
17	2%	9%	19%	35%	18%	18%
18	3%	9%	18%	36%	18%	15%
19	2%	8%	20%	47%	11%	12%
20	4%	7%	20%	37%	13%	18%
21	4%	9%	21%	44%	9%	14%
22	5%	8%	22%	45%	6%	15%
23	5%	7%	28%	45%	3%	10%
24	3%	6%	30%	54%	2%	5%
25	5%	6%	30%	52%	3%	5%
26	5%	6%	30%	53%	2%	4%
27	6%	8%	31%	48%	3%	5%
28	9%	8%	34%	44%	2%	3%
29	7%	6%	35%	50%	1%	2%
30	6%	5%	32%	53%	1%	2%
31	11%	6%	30%	50%	1%	1%
32	8%	5%	33%	52%	1%	1%
33	7%	5%	36%	50%	1%	1%
34	1%	3%	40%	52%	1%	2%
35	2%	3%	40%	54%	1%	1%

Elements 10 & 11: Information Package and Analysis Techniques

A host of new information and innovative analysis techniques are embodied in the data preparation, mitigation strategies and analysis techniques employed in the forestry plan analysis. A complete list of factors is described in detail in the forestry plan information package and analysis report. We submit that the collective activities associated with this analysis are innovative practices as described under section 2(e) of the IFPA regulation.

The harvest flow from the Morice Mitigation Composite scenario is shown in table 2a below, along with scenario 3 from the TSR III discussion paper. Scenario 3 was chosen from the TSR III discussion paper as it represents the best midterm timber supply of the options listed. The differences in information and analysis between these two analyses are substantial as one would expect given the time and resources available to the respective projects. So too are there significant differences in results, most notably the length of the uplift period and the magnitude of the midterm timber supply fall down. Information for the TSR III comparison was obtained from the public discussion paper and personal communication with Forest Analysis Branch analysts. Some highlights of these differences are compared in Appendix I to demonstrate the order of magnitude of factors considered in each analysis – the purpose of which is to establish the eligibility of the forestry plan analysis as an innovative practice under section 2(e) of the IFPA regulation.

Figure 2a: Graphic Comparison of Harvest Flows resulting from TSR III and forestry plan analyses



The combination of factors initiated in the forestry plan analysis increases the mid term timber supply by 515,000 m³ per year over the midterm timber supply forecast from the TSR III discussion paper. As discussed under element six on page five of this document, it is impractical to quantify the impact of each of the contributing factors as there are many and they are often interdependent. However, it can be said with reasonable confidence that collectively the new information, harvest and management strategies and innovative analysis techniques support a 1.1 million cubic meter AAC uplift for a decade, and the allowable cut effect of that collective effort over the short and midterm can sustain 515,000 m³ of timber supply in the TSA. This is substantiated by spatially referenced growing stock summaries and forecast harvest volumes that track by individual forest polygon where merchantable volume exists and where it is harvested from throughout the 350 year modeling horizon.

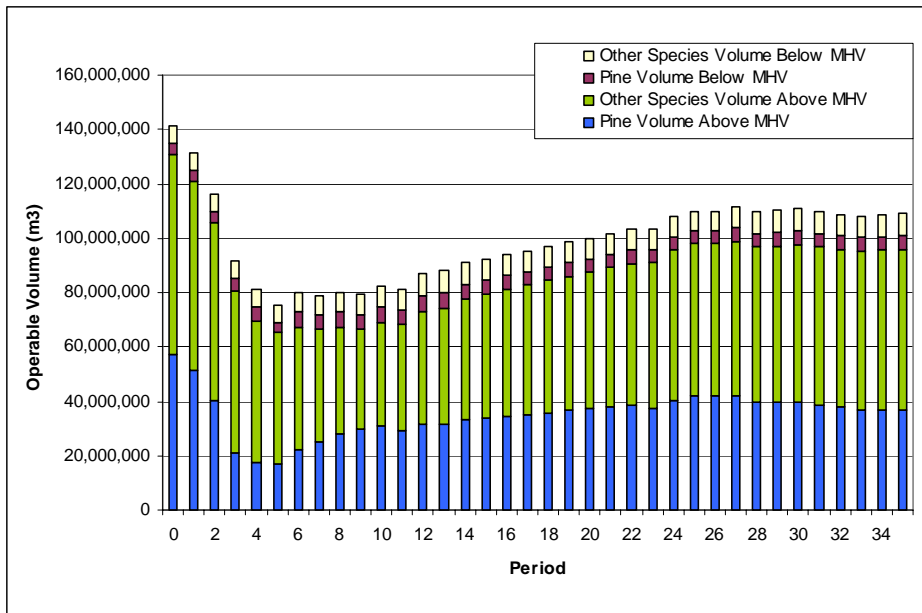
The innovative analysis work has been completed and is documented in information packages, analysis reports and the forestry plan. However, an implementation commitment is required to realize this timber supply benefit of the strategies outlined. These commitments are made in the initial forestry plan submission.

Table 2a: Tabular Comparison of Harvest Flows resulting from TSR III and forestry plan analyses

Period Harvested	Years	Mitigation Composite	TSR3 PDP Scenario 3	
		Annual Volume Request (m3)	Annual Volume Request (m3)	Difference from Adjusted Mitigation Composite
1	2002-2007	2,069,526	1,961,117	-5.2%
2	2008-2012	3,000,000	2,961,000	-1.3%
3	2013-2017	3,000,000	1,085,000	-63.8%
4	2018-2022	1,600,000	1,085,000	-32.2%
5	2023-2027	1,600,000	1,085,000	-32.2%
6	2028-2032	1,600,000	1,085,000	-32.2%
7	2033-2037	1,600,000	1,085,000	-32.2%
8	2038-2042	1,600,000	1,085,000	-32.2%
9	2043-2047	1,600,000	1,085,000	-32.2%
10	2048-2052	1,600,000	1,085,000	-32.2%
11	2053-2057	1,600,000	1,085,000	-32.2%
12	2058-2062	1,600,000	1,085,000	-32.2%
13	2063-2067	1,600,000	1,085,000	-32.2%
14	2068-2072	1,600,000	1,561,000	-2.4%
15	2073-2077	1,600,000	1,561,000	-2.4%
16	2078-2082	1,600,000	1,561,000	-2.4%
17	2083-2087	1,600,000	1,561,000	-2.4%
18	2088-2092	1,600,000	1,561,000	-2.4%
19	2093-2097	1,600,000	1,561,000	-2.4%
20	2098-2102	1,600,000	1,561,000	-2.4%
21	2103-2112	1,610,000	1,561,000	-3.0%
22	2113-2122	1,610,000	1,561,000	-3.0%
23	2123-2132	1,610,000	1,561,000	-3.0%
24	2133-2142	1,610,000	1,561,000	-3.0%
25	2143-2152	1,610,000	1,561,000	-3.0%
26	2153-2162	1,610,000	1,561,000	-3.0%
27	2163-2172	1,610,000	1,561,000	-3.0%
28	2173-2182	1,750,000	1,561,000	-10.8%
29	2183-2192	1,750,000	1,561,000	-10.8%
30	2193-2202	1,750,000	1,561,000	-10.8%
31	2203-2212	1,750,000	1,561,000	-10.8%
32	2213-2222	1,750,000	1,561,000	-10.8%
33	2223-2232	1,750,000	1,561,000	-10.8%
34	2233-2242	1,750,000	1,561,000	-10.8%
35	2243-2252	1,750,000	1,561,000	-10.8%

The timing and composition of scheduled harvest volumes and stand types is well documented under elements 8 & 9 in the above section, outlining where harvest volumes have come from. The growing stock, or standing merchantable inventory for the Mitigation scenario is provided in Figure 2b indicating the volumes available for consideration by the harvest scheduler. As expected, there is an initial large drop in growing stock in the first 5 periods predominantly due to the MPB mortality resulting in non recoverable losses and accelerated harvesting. The growing stock then starts to increase during the mid-term and becomes regulated by the long-term harvest level. Volume gains and species composition reflect the mitigation strategy of greater reliance on non pine species in future managed stands. The relative percentages between the different classifications stabilize in the latter part of the midterm harvest decline.

Figure 2b: Growing Stock graph illustrating the Amount of Pine/Non-Pine Volume Above & Below Minimum Harvest Volume (MHV) over time for the Mitigation Scenario.



It was suggested that an explanation be provided for the difference between the two harvest flows in Figure 2a. As time did not allow for an analysis report for the TSR III work this has proven to be a very speculative task. Most of the effort in this supplement has gone into substantiating the rigour and confidence of the IFPA analysis with supporting descriptions of information and analysis techniques and with summary results such as growing stock and harvest flow graphics. We are confident in the source of AAC contributions for the table 1 elements as these were developed from sensitivities run against current status practices. We also know that the harvest rule plays a significant role as described in the preceding section. A number of scenarios and sensitivities were run to select harvest and mitigation strategies (see Appendix I). Spatially explicit tracking of management constraints, blocks, roads and harvest schedules will increase implementation feasibility. Yield curves that reflect current site productivity and beetle mortality knowledge will increase confidence in volume projections. The commonly discussed concern of shelf life is not a significant contributor as there is little difference in shelf life assumptions although how they are modeled may be a factor.

Non pine volume from pine stands that go below minimum harvestable volume due to MPB mortality are kept in the growing stock graphs by a volume matching routine. These stand are put onto growth curves with reduced stocking until overtaken by naturally regenerating stands. At that point these stands are projected on yield curves for regenerated stands until they again reach harvestable volumes.

A request was made to explain when and in what quantity class A seed was used. This is explained in detail in the analysis report and forestry plan but is summarized here in response to the above request. All harvesting operations are assumed to be reforested promptly within 2 years and with 1st and 2nd generation genetically improved stock as it becomes available. Timings and availability of genetically improved stock depending on Forest Genetic Council species plans, and 2nd generation stock is projected to be available for spruce and pine by 2018. With genetically improved stock being used for reforestation starting 2018 and with the 17% to 25% in genetic worth one would expect to see a significant increase in available timber supply from this source in the mid-term due to use of the genetically improved stock. Figure 1b on page 9 graphically reflects this increase. Table 2a lists the annual area planted for each period, type of stock planted along with the genetic worth of the planting stock.

Table 2a: Annual Area Planted for the Mitigation Composite scenario

Period	Annual Planting Area (ha)	Type of Stock Planted	Expected Genetic Worth (Improvement)	Availability
1	5,833	1st Gen GI stock	Pine: 10.4-11.3 (depending on SPU Zone) Spruce: 17.5	30% for Pine; 100% for Spruce
2	8,402			
3	12,828	1st Gen GI stock	Pine: 10.4-11.3 (depending on SPU Zone) Spruce: 17.5	100% for Pine; 100% for Spruce
4	4,374	2nd Gen GI stock	Pine: 17-18 (depending on SPU Zone) Spruce: 24	100% for Spruce and Pine
5	4,838			
6	5,066			
7	5,295			
8	5,628			
9	6,114			
10	5,867			
11	6,236			
12	6,309			
13	6,303			
14	6,529			
15	6,577			
16	6,238			
17	6,243			
18	6,232			
19	6,459			
20	6,289			
21	6,445			
22	6,141			
23	6,294			
24	6,526			
25	6,312			
26	6,287			
27	6,188			
28	6,452			
29	6,639			
30	6,828			
31	6,630			
32	6,607			
33	6,467			
34	6,696			
35	6,779			

In reviewing the Morice TSR III Public Discussion Paper and the Data Package there were a number of differences between the two scenarios that would cause some differences, but most have already been mentioned. As stated earlier the most obvious of differences are elements one to five in table 1 of the forestry plan. A number of Timber Harvesting Land Base (THLB) factors were not explicitly mentioned in the forestry plan.

- For the TSR III analysis, Visual Quality was modeled using the same approach as in TSR2 (i.e. assumed a flat land base and applied the VEG Heights based only on growth of the stand and did not consider slope considerations). Whereas the Mitigation scenario used slope data and Plan to Perspective ratios to derive Visually Effective Green-up for Visual Assessment purposes. Since the TSR III data was not available, it's hard to

isolate the impact of this difference but initial investigations during the IFPA modeling had shown that modeling Visuals in the traditional approach did have a significant impact on the harvest level that could be achieved.

- In-block cut block retention within the Mitigation scenario was based upon varying retention levels by landscape unit and BEC variant based on the method described in the Landscape Unit Planning Guidebook. This resulted in an area weighted average of 6% across the Morice T.S.A.%. The cut block retention for the TSR III scenario was 10%.
- Road and landing deductions were spatially calculated rather than being inferred from previous analyses.
- Inclusion of previously excluded problem forest types based upon information from new studies.

Element 12: Secondary Stand Structure Sensitivity

The rationale for risk reduction with this element is similar to the element 7 rationale as it addresses the most recent significant uncertainty with mid term timber supply. The forestry plan harvest rule makes no specific provision for conserving sapling understory or mature non-pine for midterm timber supply, as is contemplated by draft regulation applicable to pine stands. While not protecting sapling understory may intuitively been seen as a risk to implementing the forestry plan harvest rule, this sensitivity demonstrates that it is not significant. Instead it demonstrates that even current AAC levels will crash if such a regulation is implemented in the TSA, as the abundance of understory will make the majority of pine stands ineligible for salvage harvesting.

Secondary stand structure has two components; residual non pine volume in pine stands, and the sapling understory in merchantable pine stands that can be expected to contribute to midterm timber supply if protected from salvage harvesting. Residual non pine volume in pine stands was maintained on a growth curve with reduced stocking in the Mitigation scenario and contributed to growing stock in the analysis. Secondary stand structure from understory sapling layers needed to be added to the growing stock to be included in the analysis.

Based upon Dave Coates August 2006 Report for the Chief Forester, "Abundance of Secondary Structure in Lodgepole Pine Stands affected by Mountain Pine Beetle", a sensitivity was developed to test the contribution of sapling understory to midterm timber supply in the Morice TSA. A method to incorporate this work was discussed with and endorsed by analysts from the Forest Analysis Branch. Merchantable stands with 50% or more pine volume were randomly assigned an understory proportional to the probability of understory occurring in the BEC classification for that stand. For example, if the SBS mc2 had a 70% percent probability of having a suitable sapling understory in the research, then 70% of the pine stand area in that category was assigned a sapling understory in the inventory. Adjusted yield curves were then developed to incorporate the growth contribution of the sapling understory into the forestry plan growth curve.

The forestry plan Mitigation Composite scenario analysis was remodeled using these adjusted growth curves and showed modest midterm improvements from the adjusted yield curves. As well, a sensitivity was run that deferred harvesting in non pine stands for a decade and deferred harvesting in understory stands until the understory was expected to become merchantable. For the sensitivity all stands with 150 or greater cubic meters per hectare of non pine were deferred from cutting for the uplift period. As well, stands with understory were deferred for 60 years to allow understory saplings to reach merchantable size. These were the only changes for the secondary stand structure sensitivity, and the Mitigation Composite scenario harvest rule was used to select stands from that constrained pool of growing stock. The results of these two modeling outputs are shown in Figure 3a.

Retaining understory stands to merchantability provides a midterm timber supply advantage of approximately 50,000 cubic meters annually for 80 years over the mitigation scenario harvest flow. Table 3a shows this volume to total 4.2 million cubic meters. However, the mid-term increase in harvest volume in the secondary species sensitivity does not make up for the volume lost during the AAC crash in period 3. There is a 2.5 million AAC decline in years six to ten for a total volume decline of 12.5 million cubic meters, and a net volume decline of 8.3 million cubic meters over 90 years.

While there is no AAC request attached to this element it is an eligible activity for consideration under section 2(e) of the IFPA regulation to reduce uncertainty in statutory decision making related to accelerated salvage harvesting.

Figure 3a: Comparison of the Adjusted Mitigation Composite and Secondary Structure Sensitivities (note that both runs include understory volumes).

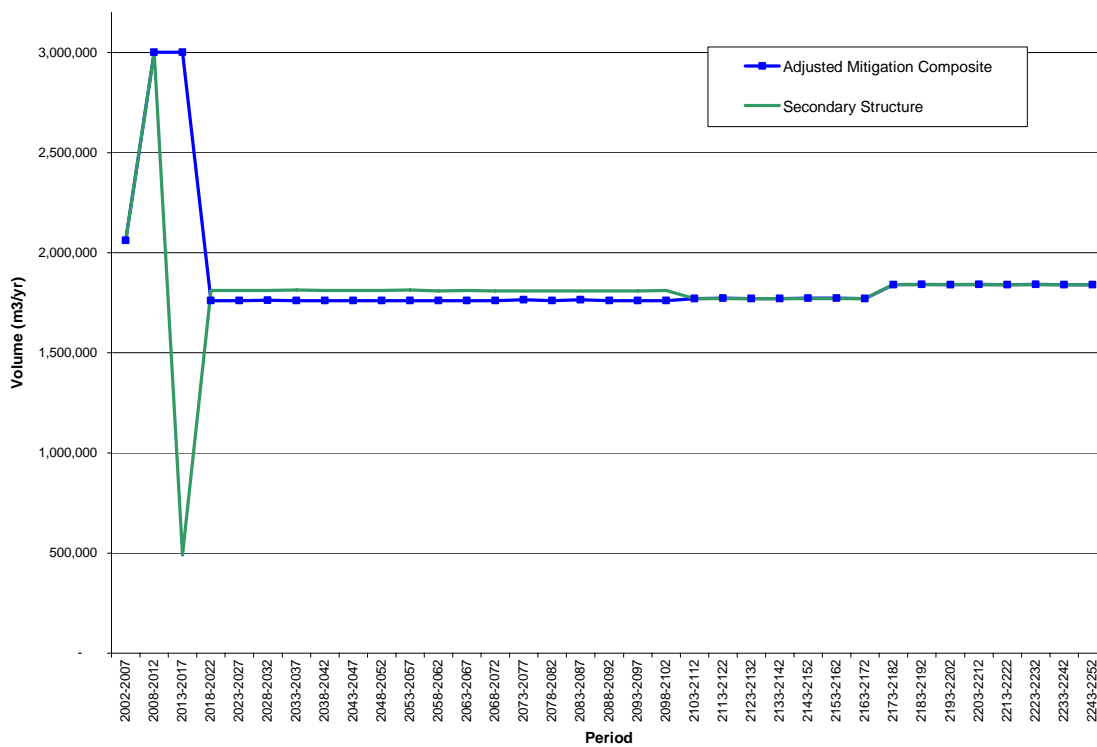


Table 3a: Data Table comparing the Adjusted Mitigation Composite and Secondary Structure Sensitivities (note that both runs include understory volumes).

Period Harvested	Years	Adjusted Mitigation Composite	Secondary Structure	
		Annual Volume Request (m3)	Annual Volume Request (m3)	Difference from Adjusted Mitigation Composite
1	2002-2007	2,060,590	2,060,637	0.0%
2	2008-2012	3,000,747	3,000,246	0.0%
3	2013-2017	3,001,084	491,502	-83.6%
4	2018-2022	1,760,207	1,810,228	2.8%
5	2023-2027	1,760,312	1,810,504	2.9%
6	2028-2032	1,761,540	1,810,332	2.8%
7	2033-2037	1,760,319	1,813,033	3.0%
8	2038-2042	1,760,316	1,810,225	2.8%
9	2043-2047	1,760,213	1,811,467	2.9%
10	2048-2052	1,761,074	1,810,385	2.8%
11	2053-2057	1,761,076	1,812,420	2.9%
12	2058-2062	1,760,467	1,809,790	2.8%
13	2063-2067	1,760,182	1,810,350	2.9%
14	2068-2072	1,760,261	1,809,846	2.8%
15	2073-2077	1,763,786	1,810,061	2.6%
16	2078-2082	1,760,193	1,809,894	2.8%
17	2083-2087	1,763,611	1,809,848	2.6%
18	2088-2092	1,760,468	1,810,080	2.8%
19	2093-2097	1,760,913	1,810,092	2.8%
20	2098-2102	1,760,622	1,810,403	2.8%
21	2103-2112	1,771,277	1,771,137	0.0%
22	2113-2122	1,772,073	1,771,067	-0.1%
23	2123-2132	1,771,138	1,771,149	0.0%
24	2133-2142	1,771,199	1,771,234	0.0%
25	2143-2152	1,771,649	1,771,374	0.0%
26	2153-2162	1,772,186	1,771,467	0.0%
27	2163-2172	1,771,312	1,771,414	0.0%
28	2173-2182	1,840,496	1,842,092	0.1%
29	2183-2192	1,841,048	1,840,304	0.0%
30	2193-2202	1,840,420	1,841,743	0.1%
31	2203-2212	1,841,186	1,840,414	0.0%
32	2213-2222	1,840,154	1,840,469	0.0%
33	2223-2232	1,840,653	1,840,443	0.0%
34	2233-2242	1,840,187	1,840,418	0.0%
35	2243-2252	1,840,173	1,840,199	0.0%

Also included in this section are the growing stock graphs for the Adjusted Mitigation Composite scenario and the Secondary Structure sensitivity, Figures 3b and 3 respectively. The trends for the two scenarios are quite similar, both start at ~140 million and there is an expected large drop in growing stock in the first 5 periods predominantly due to the MPB mortality. The growing stock then starts to increase during the mid-term and becomes regulated by the long-term harvest level. The relative percentages between the different classifications remain pretty constant throughout the planning horizon.

Figure 3b: Growing Stock graph illustrating the Amount of Pine/Non-Pine Volume Above & Below Minimum Harvest Volume (MHV) over time for the Adjusted Mitigation Scenario.

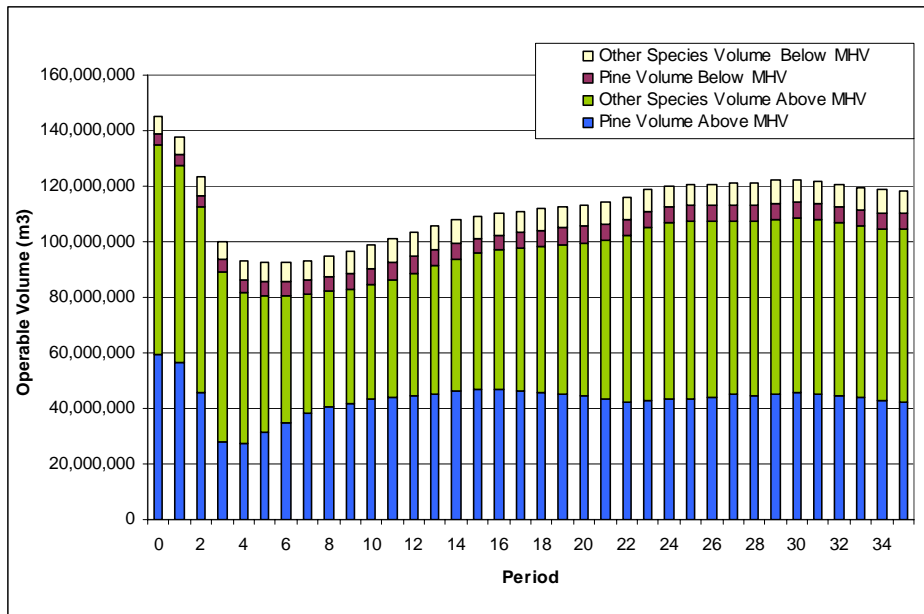
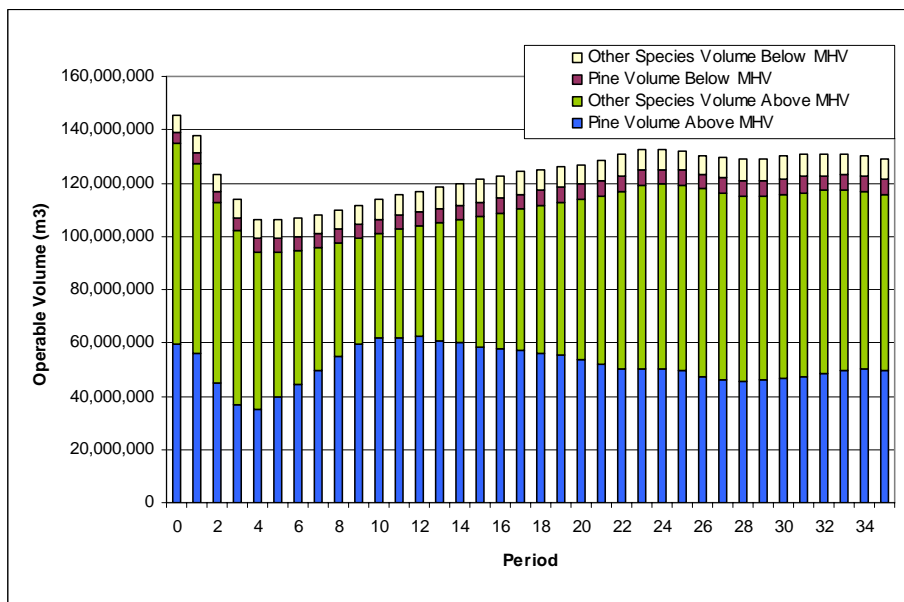


Figure 3c: Growing Stock graph illustrating the Amount of Pine/Non-Pine Volume Above & Below Minimum Harvest Volume (MHV) over time for the Secondary Structure Sensitivity.



Element 13: Prompt Implementation

In any salvage strategy the capacity for prompt implementation is normally a key success factor. Licensees applying for the uplift in this forestry plan have strategic and operational plans in place that can be quickly ramped up to address accelerated harvesting in the Morice TSA. Approved plans and competent staff are in place to address the accelerated need for cutting authorities. This surge capacity has been an obstacle in implementation of nearly all of the previous MPB expedited AAC decisions. While there is no AAC request attached to this element it is an eligible activity for consideration under section 2(f) of the IFPA regulation, particularly as implementation delays have resulted in significant non recoverable losses in other TSAs.

Appendix I
Information Package and Analysis Highlights

Appendix I: Innovative elements of the data and analysis

This section serves to provide context in the amount of analysis work that has been undertaken in the Morice TSA.

Starting in 2002 a Current Status scenario was developed for the Morice TSA using the TSR2 as the basis for comparison. This scenario was followed up by a number of learning scenarios during 2003 and 2004 which focused on specific resource issues, Agriculture, Recreation, Ecosystem and Forest Productivity. Criteria to measure Indicator Reporting protocols were developed within an SFM Framework and these scenarios were also used to help guide development of targets for each indicator. In 2005 to 2006, the Decision and Mitigation scenarios were developed using some of the learnings from the previous scenarios. SFM Plan targets were developed for the land base based on these scenarios. These targets that were developed are evaluated periodically based on the indicator in question through an Annual Indicator Monitoring project.

During 2006 when preparing for the Forestry Plan submission, discussions with Forest Analysis Branch recommended that we include the MPB epidemic mortality and the Morice LRMP into the Current Status datasets to provide a benchmark for evaluation. MPB was deemed to be current status at the time, so both the revised "Current Status" and "Current Status with LRMP" includes MPB mortality. There were a number of sensitivities developed to identify the impact of a "changed issue" on timber supply. These sensitivities were based on either the Decision or Mitigation scenarios as indicated.

- Decision scenario
 - Change Future species comp to 60:40 Spruce/Pine mix
 - Relax Visual Constraints
 - Relax Seral Constraints
 - Change Minimum Harvest Volumes to 80m³/ha for Spruce/Pine and 100 for Balsam.
 - Use OAF1 values from TSR
 - TSR2 Genetic Worth
 - Non-Adjusted Site Index
- Mitigation Scenario
 - TSR2 Genetic Worth
 - Relative Oldest First harvest priority (only, no other priorities were inferred)
 - Use OAF1 values from TSR
 - Only use paired-plot study (OGSI) to adjust SI
 - Change Future Species % to better meet operational requirements, keep pine on dry sites, etc.
 - 1st implementation of Genetically Improved Stock sensitivity, required revision based on operational timing considerations

Data/Analysis	Elements	Current Status with LRMP and MPB	TSR III Scenario	Mitigation Scenario	Comments
Data – Yield Curves	Yield Curves – Developed Polygon specific curves to retain unique characteristics of the forest inventory	Yes	No – used area weighted averages	Yes	<i>Polygon specific yield curves provides for enhanced resolution of the projected forest attributes. See approved Forest Productivity Scenario Yield Curves Report & Approval Letter.</i>
	Yield Curves – Adjusted Future Managed SI based on SIBEC/OGSI	No	Yes, but only made adjustments based on paired-plot study (OGSI)	Yes	<i>Reflects better future Site Index values which are known to be understated. See Approved Forest Productivity Scenario Yield Curves Report & Approval Letter.</i>
	Yield Curves – Adjusted Volume based on Increased Utilization Specs (15cm stump height)	No	No	Yes	<i>Represents current management not incorporated in previous TSR analyses.</i> Operationally this practice has been occurring on the land base but has not been recognized in TSR analyses. The IFPA had undertaken studies to evaluate the impact of decreasing the stump height from 30cm to 15cm. The studies have shown a 2% increase in volume. See approved Forest Productivity Scenario Yield Curves Report, & Approval Letter.
	Yield Curves – Adjusted Volume based on OAF1	No	No	Yes	<i>IFPA Study and Report indicate that 15% OAF1 value is overstated and the current actual OAF1 value should be lower.</i> See approved Forest Productivity Scenario Yield Curves Report, & Approval Letter.

Data/Analysis	Elements	Current Status with LRMP and MPB	TSR III Scenario	Mitigation Scenario	Comments
	Yield Curves – Incorporated MPB Reductions based on BC MPB Project	Yes	Yes – though not sure how TSR III integrated MPB reductions.	Yes	<p><i>Integrated a detailed adjustment process to account for MPB reductions in a spatially refined manner (by landscape unit).</i></p> <p>See approved “Epidemic Mountain Pine Beetle Curve Adjustments” Report & Approval Letter.</p>
	Yield Curves – Included shelf life in attacked MPB stands.	Yes – 5 years	Yes – Effectively a 4 year shelf life (2.5 years, 2 years after attack 100% of trees available, 3 rd year 50% of trees available and 4 th year 0% available for saw logs).	Yes – 5 years	<p><i>Integrated shelf life in a detailed yield curve adjustment process to spatially refined shelf-life within each landscape unit and be able to report on NRLs.</i></p> <p>See approved “Epidemic Mountain Pine Beetle Curve Adjustments” Report & Approval Letter.</p>
	Yield Curves – Adjusted curves based on free-growing densities experienced in the silviculture Free-Growing surveys	No	No	Yes	<p><i>Improved volume/density estimates by using Free-growing surveys to benchmark the managed stand yield, density and other attributes. Improved estimates were stratified using BEC classification as well.</i></p> <p>See approved Forest Productivity Scenario Yield Curves Report & Approval Letter.</p>
	Yield Curves – Incorporated FGC predictions of Genetic Gain for future managed stands	No	No	Yes - Implements forecast progeny tested FGC seed availability for Seed Planning Units in the TSA.	<p><i>Captures investment in forest genetics and seed production.</i></p> <p>See approved Forest Productivity Scenario Yield Curves Report & Approval Letter.</p>

Data/Analysis	Elements	Current Status with LRMP and MPB	TSR III Scenario	Mitigation Scenario	Comments
	Yield Curves – Incorporated additional items into the yield curves for habitat assessment, e.g. CWD, Snags, ECA, Crown Closure, Carbon.	Yes	No	Yes	<p><i>Allows measurement of Non-Timber values for SFM indicators.</i></p> <p>See approved Forest Productivity Scenario Yield Curves Report, & approval letter.</p>
Data – Land Base	Source Data – Forest Cover updates	Updated for depletions to 2004	Updated for depletions to 2005 using NWDSN data.	Updated for depletions to 2004	<i>Increased resolution of the Forest Inventory Information</i>
	Morice LRMP Integration – where spatially possible LRMP datasets/intents were incorporated into the analysis.	Yes	Yes	Yes	<i>Increased resolution of the constraints on the land base, incorporating public values where possible.</i>

Data/Analysis	Elements	Current Status with LRMP and MPB	TSR III Scenario	Mitigation Scenario	Comments
	Roads – Full road access network spatially modeled based upon operational road parameters, access constraints and merch volumes	10m for operational; 5m for spur	Same as Current Status with LRMP and MPB	18m for operational; 10m for spur	<i>Better representation of road impacts on THLB.</i>
	Landings	2.1% for all landings	Same as Current Status with LRMP and MPB	2.1% reduction for existing landings; no reduction for future landings	<i>Better representation of road impacts on THLB as most harvesting in the TSA now uses roadside processing instead of landings.</i>
	Non-Merchantable Forest Types – different assumptions were applied to the Mitigation and TSR III scenarios to allow for stand conversions to commercial species.	Excluded the following stands from the THLB: Fir leading (Type 1-8); Hemlock leading (Type 12-17); Spruce/Fir Mixed (Type 22) Spruce/Hemlock Mixed (Type 23) Larch Leading (Type 33 – 34) Cottonwood Leading (Type 35 - 36) Birch Leading (Type = 40) Aspen Leading (Type 41 - 42)	Same as Current Status with LRMP and MPB	Excluded the following stands from the THLB: Cottonwood Leading (Type 35 - 36) Birch Leading (Type = 40)	<i>Enhanced information. Many Problem forest types in the Inventory may in fact be merchantable. See IFPA Report Analysis of PFT and Low site polygons. http://www.moricelakes-ifpa.com/publications/documents/SFM24Web.pdf</i>

Data/Analysis	Elements	Current Status with LRMP and MPB	TSR III Scenario	Mitigation Scenario	Comments
	Areas Unavailable for harvest due to economics	Maintained Uneconomic areas from TSR2.	Same as Current Status with LRMP and MPB	Included areas previously deemed uneconomic into the THLB	<i>Mitigation scenario assumed that in the future these stands would potentially be harvested with the shortage in fibre supply</i>
	Harvest scheduling units	Polygon specific spatial constraints based upon operationally driven blocking algorithm	Not Used	Polygon specific spatial constraints based upon operationally driven blocking algorithm	Better represents the composition, growth and harvesting constraints of the growing stock and provides an operationally realistic harvest block design.
Analysis – Modeling	Harvest Priorities	Relative Oldest First harvest Priority	Pine stands >=70% pine harvest prioritized during uplift period	Stands classified into 7 pine volume classes, 1 being highest volume/ha of pine and 7 being lowest volume/ha pine) Pine volume classes were prioritized for harvest based on the volume classes 1-7.	<i>Allows flexibility in removing stands with a greater volume of pine than TSR III and reduces NRLs more than TSR III scenario.</i>
	SFMP landscape level indicators (biodiversity patterns)	No	Unknown	Substantial efforts – patch, seral, interior forest	Recognizes explicit landscape pattern constraints, Applies BGB, LUPG, LRMP and SFM constraints spatially.
	Visual Constraints	Modeled in traditional TSR2 approach	Modeled in traditional TSR2 approach	Used Slope info and Plan to Perspective ratios to derive new VEG Heights.	Better represents operational factors that are considered when determining Visual Impacts