

Southern Interior Beetle Action Coalition

Forest Sector Trends Analysis -
Estimated Mid-term Timber Supply Impact
Summary

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FINAL

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1 Introduction

The purpose of this summary is to document the potential timber supply impacts due to the mountain pine beetle (MPB) using currently available timber supply information. No new timber supply analysis was to be completed for this project.

The geographical region for this assessment is the SIBAC region which consists of eleven Timber Supply Areas (TSAs) as illustrated in Figure 1.

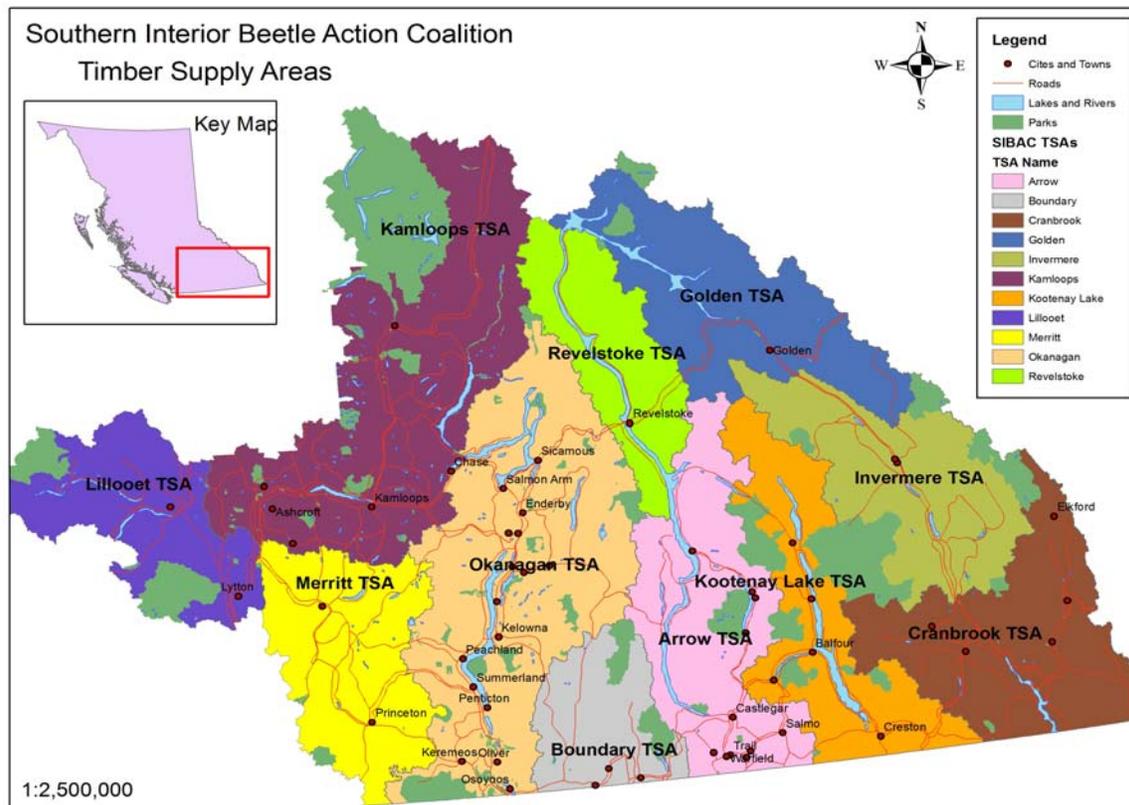


Figure 1 Southern Interior Beetle Action Coalition Timber Supply Areas (SIBAC TSAs)

As of the mid 1990's the MPB has been progressing to epidemic proportions through the northern and southern interior forests of British Columbia. Since then there have been numerous regional assessments (MOF 2003, COFI 2006, MOF 2007) of the anticipated MPB impacts on timber supply. Each of these studies providing updates and improved understanding and new information regarding the timber supply impacts due to the MPB. Given the uncertainty in the MPB spread, attack and kill of pine volume, the forecasting of timber supply impacts that will realized up to 60 years or more into the future remain equally uncertain. Considering this and the fact that some of the SIBAC TSAs have recently had updated timber supply analysis and the remainder will be updated over the next two years, an intensive timber supply update at this time would not significantly reduce the uncertainties and would be duplicating efforts that will be undertaken as part of the upcoming timber supply reviews (TSR).

2 SIBAC TSA Summary Information

The source data for the profile summaries and pine volume loss estimates were based on the same data the MOFR used for the Timber Supply and the Mountain Pine Beetle Infestation in British Columbia 2007 Update report. This report presented a summary and analysis of 20 MPB impacted TSAs throughout BC and was conducted as a regional analysis with broad assumptions applied across all TSAs. MOF provided the basic inventory and MPB attack information from the MPB analysis.

2.1 Species Profile

TSA species profiles provide an indication of the risk to future harvest based on the composition of pine leading stands as compared to other species. Figure 2 provides the distribution of species by timber harvesting land base (THLB) area for each of the SIBAC TSAs.

Overall, the SIBAC region THLB consists of approximately 37% pine leading stands and as shown, the Merritt TSA exhibits the largest proportion of pine leading THLB (70%) while the Revelstoke TSA has the least. Along with Merritt, the Cranbrook, Boundary, Invermere and Lillooet TSA's exhibit more than the SIBAC average pine leading THLB.

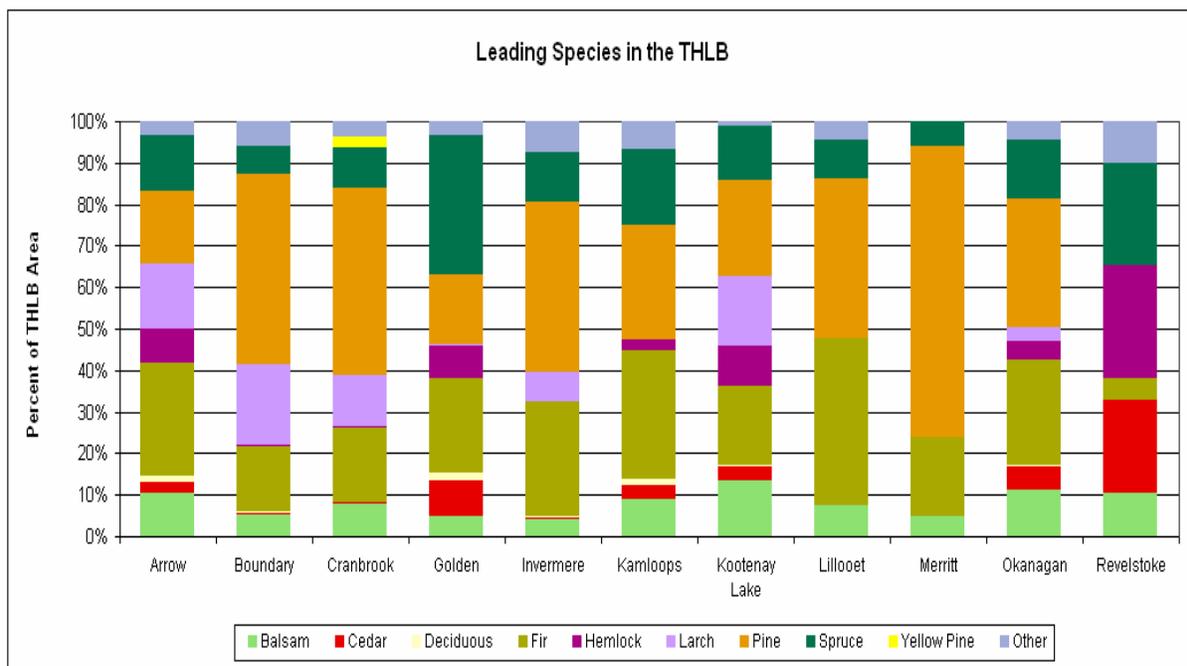


Figure 2. Leading species distribution for SIBAC TSAs.

2.2 Current AAC

Allowable Annual Cut (AAC) determinations have been established since the early 1980s in British Columbia. Figure 3 shows the current AACs for each of the SIBAC TSAs. The Kamloops, Merritt and Okanagan TSAs currently have established MPB uplifts and have the

largest AACs contributing almost 70% of the overall AAC within the SIBAC region totaling over 10 million m³/year.

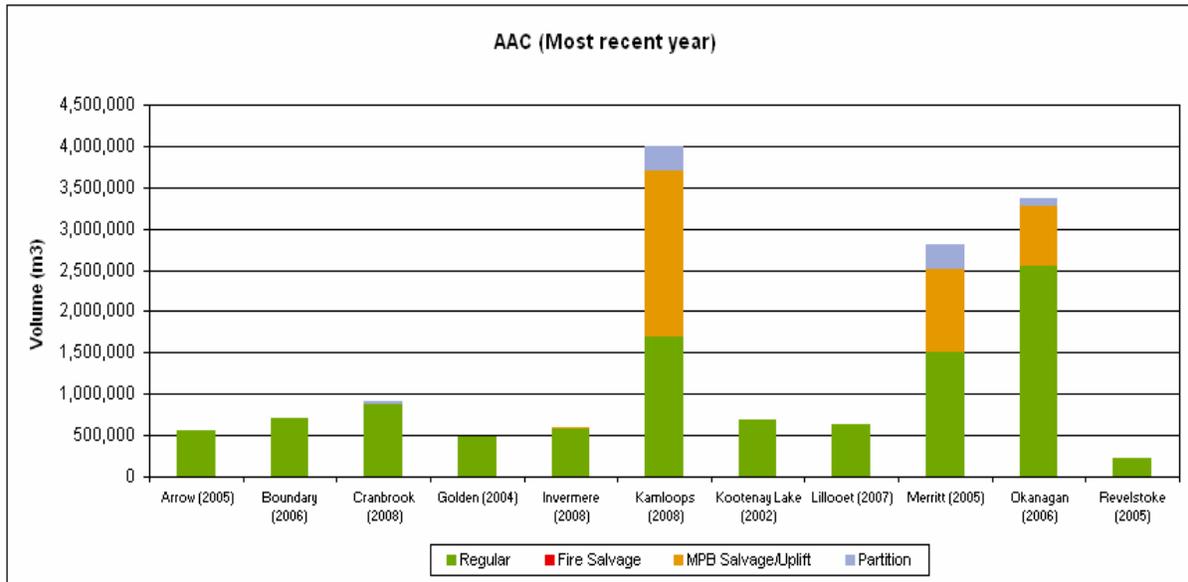


Figure 3. Current AAC and date of currency for SIBAC TSAs.

The Kamloops, Okanagan and Merritt TSAs have significant AAC uplifts currently in place to address the MPB epidemic. Other factors including fire salvage, land base and information improvements have also resulted in previous SIBAC TSA AAC increases including: assumptions surrounding the growth and yield, inventory and forest management improvements.

Most of the current SIBAC TSAs AACs will be revised during 2009/10 with the exception of Kamloops, Cranbrook and Invermere, which are relatively recent being completed in 2008, and Boundary, which is not scheduled for completion until 2011 (Table 1). The Kamloops TSA AAC was increased significantly for pine salvage while the Cranbrook and Invermere AAC were postponed under section 8 (3.1) of the Forest Act, which allows the chief forester to postpone the AAC up to 10 years from the previous determination if there is no expected change in timber supply.

The postponement for the Cranbrook and Invermere TSAs considered the current status of MPB within the TSAs and even though there is a significant component of pine, did not establish any uplifts at this time. For the Cranbrook TSA, the uncertainty associated with the MPB in terms of future attack and potential impact was noted, however, the population is thought to be stable but is expected to increase over the next few years. For the Invermere TSA it was noted that the MPB infestation has not been as significant and current harvest levels have been sufficient to allow licensees to prioritize attacked stands and as such no additional uplift was required.

Table 1. AAC Decision schedule for SIBAC TSAs.

TSA	AAC Decision
Kamloops	May-08
Cranbrook	September-08
Invermere	September-08
Lillooet	March-09
Golden	May-09
Kootenay Lake	July-09
Merritt	October-09
Revelstoke	December-09
Okanagan	April-10
Arrow	June-10
Boundary	February-11

Except for Kamloops, Lillooet and to a lesser extent Merritt and Okanagan most of the other TSAs timber supply projections, MPB and “current” forest management assumptions are dated in the timber supply reviews. The addendum for the Lillooet TSA for Mountain Pine Beetle Impact Assessment provides up to date, detailed analysis investigating the impacts of the MPB on timber supply. The ongoing and future SIBAC TSA TSRs will provide an updated timber supply projection which is likely to incorporate more detailed MPB attack assumptions and future harvest level impacts. There is the potential for more uplifts in the SIBAC TSAs, however, there is no guarantee that the volume will be allocated or utilized, especially given current economic conditions.

SIBAC are encouraged to monitor the timber supply review process as they are completed for their respective TSAs to provide input to and an opportunity to assess the timber supply dynamics, changes and variations to the estimates provided in this report.

2.3 Current Timber Supply

The Timber Supply Review (TSR) process is typically completed every 5 years in British Columbia in support of the AAC determination by the chief forester unless postponed under Section 8 (3.1) of the Forest Act.

The timber supply analysis completed for each SIBAC TSA was completed independently of other TSAs. For summary purposes the most recent TSR timber supply base case projection for each TSA were combined for SIBAC and are presented in Figure 4. This is presented only for information purposes and should not be viewed as a dynamic timber supply forecast for the SIBAC region given the variation in data, assumptions and vintages of the projections. Of special note, only a few of the TSA forecasts include MPB attack, spread and kill assumptions while most others did not.

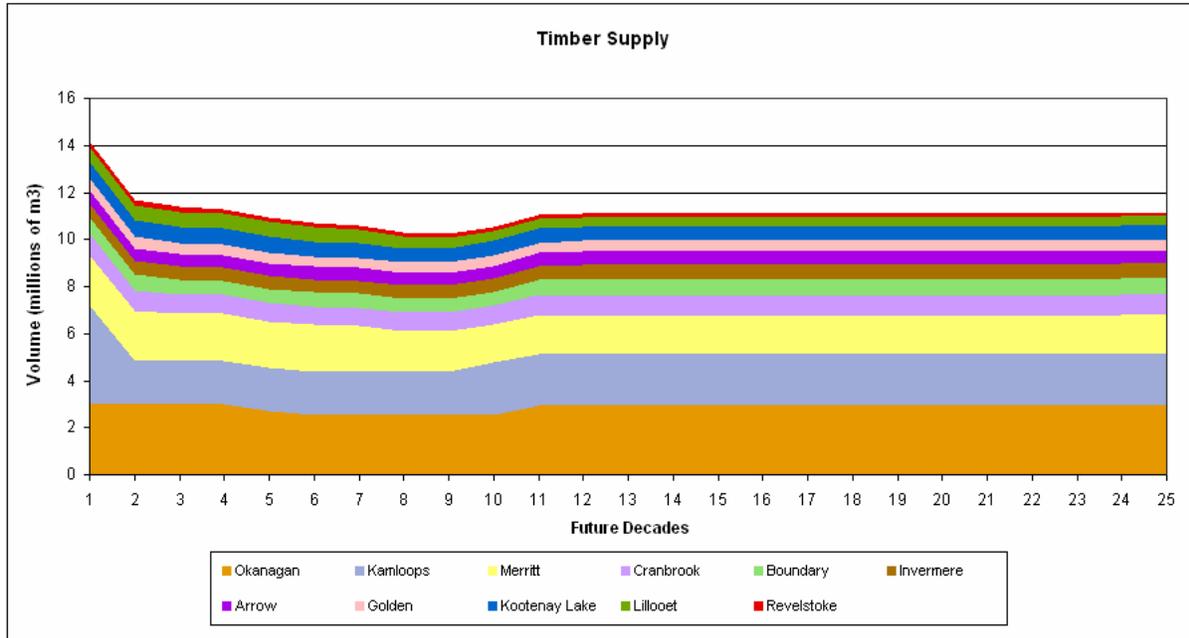


Figure 4 – Combined TSA timber supply (most recent TSR base case scenario) for SIBAC TSAs.

Over the timescale presented, the base case timber supply for the SIBAC TSAs is projected to decline from approximately 14 million m³/year to approximately 11 million m³/year from the short term to the long term. While these timber supply projections do not fully reflect future impacts of the MPB or potential uplift and fall down that may occur, the forecasted timber supply exhibits a downward trend for the next century. The new timber supply reviews that will support revised AACs (Table 1) will present a revised picture of the future timber supply trend for the SIBAC region.

Figure 5 provides a more detailed description of the short, medium and long term timber supply for each of the SIBAC TSAs. The short term represents the first 20 years in the timber supply projection, the mid-term 21 to 110 years and the long term, 111 years and greater.

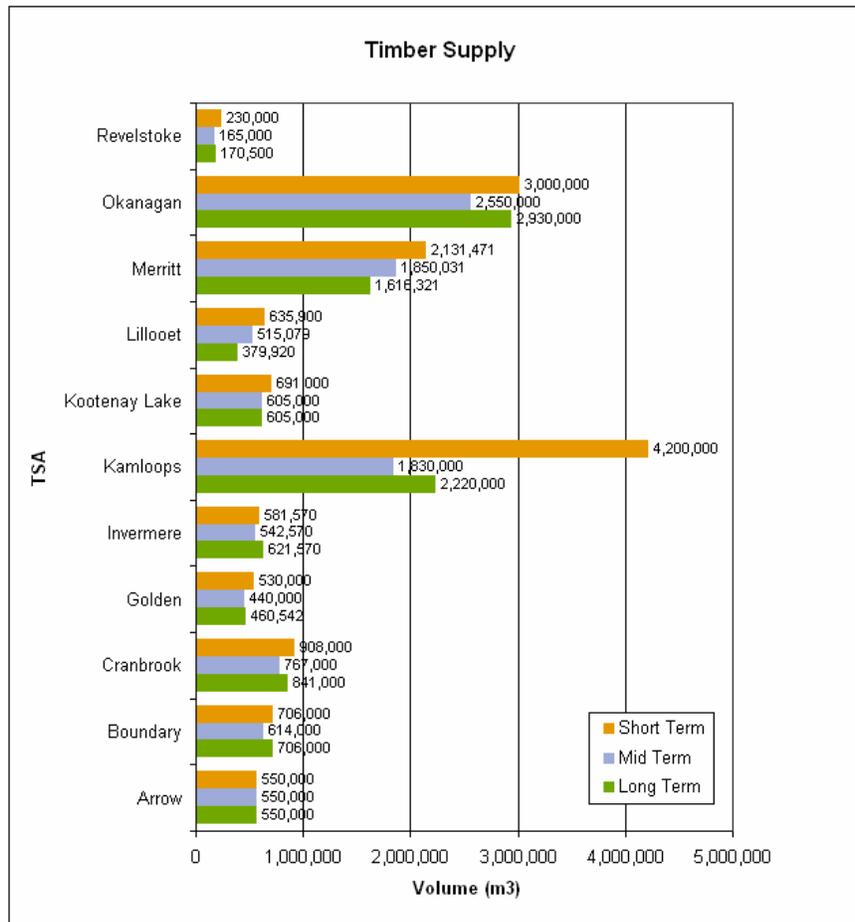


Figure 5. Short, medium and long-term timber supply (most recent TSR base case) for SIBAC TSAs. Short term: first 20 years, Medium term: 21-110 years, Long term: >110 years.

3 Estimated Pine Volume at Risk

The MPB related timber supply challenges for the southern interior are dictated by two key factors: the anticipated attack, spread and the potential loss of volume due to the MPB attack and the focus of harvest priority on pine.

The potential for actual MPB attack and loss of pine volume is represented by the proportion of pine within the timber harvesting land base for each TSA. Those TSAs with high proportions of pine have a larger population for attack and potentially lost. From Figure 2, Merritt, Cranbrook, Invermere and Boundary TSAs all have almost 50% or more of their timber harvesting land base in pine leading stands.

In order to assess the level of risk to future timber supply, predicted pine loss estimates were calculated for each SIBAC TSA (see individual Fact Sheets) and are summarized for the SIBAC region in Figure 6. These loss summaries present the estimated pine growing stock (all pine volume) loss excluding harvest through to the end of the projected MPB attack in 2023. The Provincial- Level Mountain Pine Beetle Model (BCMPB) provides an estimate of the current condition of pine mortality for each TSA and forecasts the spread of the MPB infestation into the future. These results were combined with provincial shelf life estimates to come up with loss estimates as presented in Figure 6.

It is estimated that there was approximately 472 million m³ of pine growing stock combined for the SIBAC region in 1999. Between 1999 and 2008, approximately 7% or almost 2 million m³ of the pine growing stock was considered attacked and had reached the end of the estimated shelf life or pine volume at risk of loss. It is unclear how much of this potential loss was captured by harvest, as actual harvest numbers for 2008 were not complete at the time of writing. Also, it is unknown how much future harvest will capture this loss. Considering these uncertainties, the most significant risk and potential impact of the MPB infestation is expected to occur between 2008 and 2018 where 60% of the pine growing is predicted to have been attacked and will reach the end of the estimated shelf life. Overall, pine growing stock at risk over this 10 year period is approximately 281 million m³.

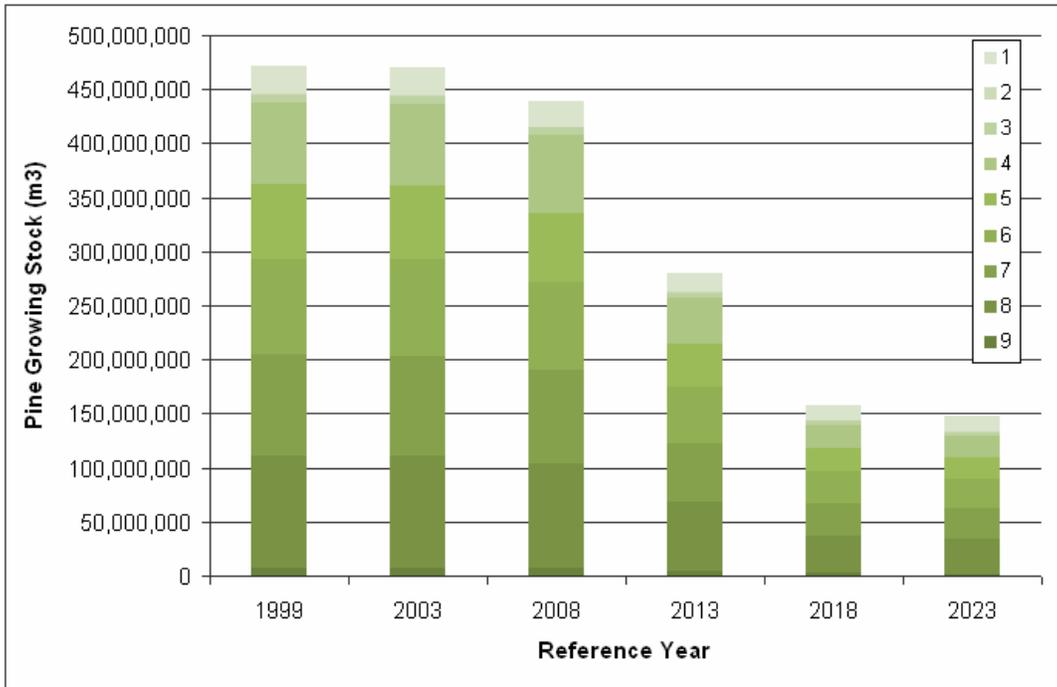


Figure 6. Pine growing stock loss (volume by age class) estimation for SIBAC TSAs combined over 1999, 2003, 2008, 2013, 2018 and 2023 reference years – excluding harvest.

4 Estimated Mid-term Timber Supply Impact

In 2007, the MOFR completed - Timber Supply and the Mountain Pine Beetle Infestation in British Columbia 2007 Update (MOFR - Forest Analysis and Inventory Branch) analysis report which assessed the potential timber supply impact throughout the 22 MPB impacted TSAs throughout British Columbia. Of the SIBAC TSAs, only the Revelstoke TSA was not included in this analysis. In general, the results of this analysis indicate that medium and potentially long term harvest levels in TSAs with the largest percentage of pine are highly influenced by the harvesting patterns and species harvest priority during the next 5 to 10 years which coincides with the peak attack and potential for volume loss throughout the SIBAC region. If the forest industry and government are able to direct their harvest activity those stands that have been attacked or have a high risk of attack, and will decay the fastest following the MPB outbreak, the impact on mid-term timber supply (Figure 5) can be significantly reduced. Additionally, if new non-sawlong uses for pine fibre are increased, such as that occurring with biofuels and energy production (with potentially longer shelf life), there will be an obvious increase in fibre utilization and sites will be put back into production more quickly. There are also other opportunities for mitigation or reduced impacts through land base investment in silviculture, rehabilitation and fire risk management that should be considered.

In their report the MOFR investigated the MPB related timber supply impacts (Figure 7 and Table 2) based on two scenarios:

Scenario One: focuses all short-term harvest in pine-dominated stands that are experiencing mortality and expected to be unharvestable in the mid-term due to the beetle infestation. First priority: >70 percent pine with mortality, second priority: >70 percent pine without mortality, third priority: pine-leading <70 percent pine, fourth priority: non-pine leading stands.

Scenario Two: lowest harvest priority in pine dominated stands (70%) with mortality, all other stands in THLB are eligible for harvest with highest priority given to stands with highest volume.

Key assumptions for this study were:

- focus on short term harvest (next 5-10 years) and expected harvest level in 60 years, no long-term (expectations that eventually pre-MPB long term harvest levels will be realized),
- BCMPB ver 3.0 used to estimate the current extent of pine mortality, and to project the infestation into the future (as well as to initiate MPB attack for shelf life),
- sawlog based shelf life - 100% useable for 2 years, 50% at 3 years, 0% > 3 years,
- initial harvest based on current AAC (including uplifts),
- mid-term harvest level was determined by finding the highest harvest a TSA could sustain that allowed the forest growing stock on the timber harvesting land base to recover to the most recent pre-infestation level based on respective Timber Supply Review analysis.

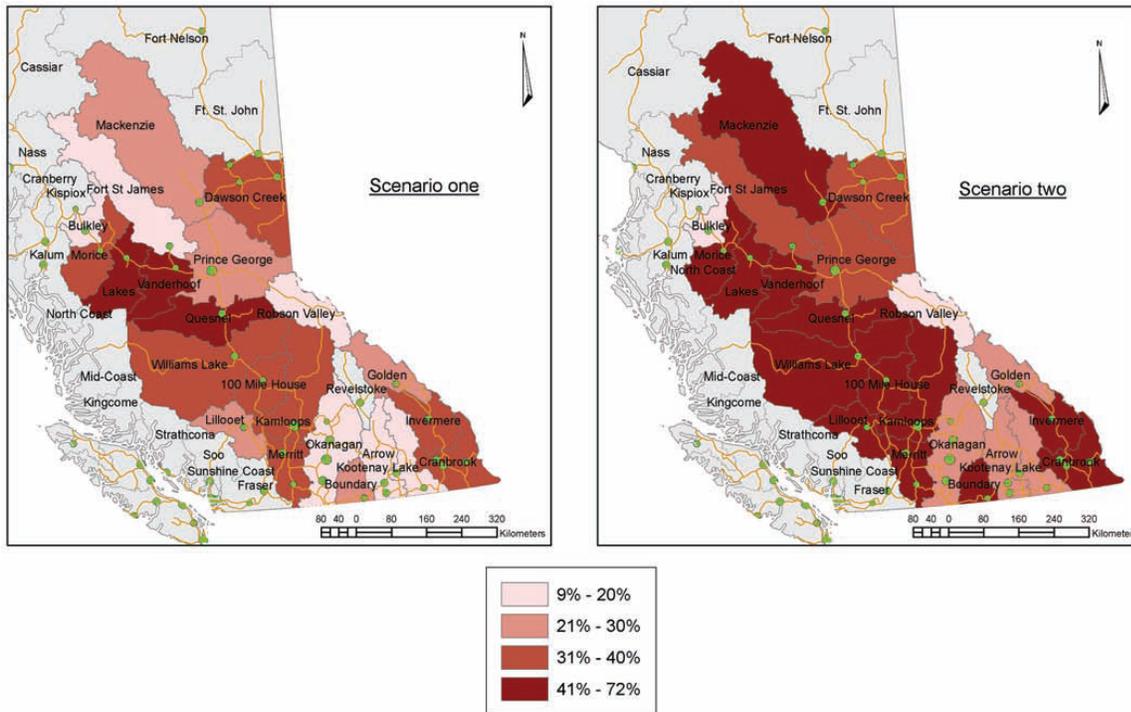


Figure 7. Mid-term timber supply impact % for each Scenario – source: Timber Supply and the Mountain Pine Beetle Infestation in British Columbia 2007 Update (MOFR - Forest Analysis and Inventory Branch)

Table 2. Summary of mid-term timber supply impact % for MPB Impact Scenarios 1 and 2 for SIBAC TSAs.

TSA	MPB Impact Scenario 1		MPB Impact Scenario 2	
	Low Impact %	High Impact %	Low Impact %	High Impact %
Arrow	9	20	21	30
Boundary	21	30	41	72
Cranbrook	31	40	41	72
Golden	21	30	21	30
Invermere	31	40	41	72
Kamloops	31	40	41	72
Kootenay	9	20	21	30
Lillooet	21	30	41	72
Merritt	31	40	41	72
Okanagan	9	20	21	30
Revelstoke	0	0	0	0

Since the specific MPB impact timber supply projections (Scenario 1 and 2) for each SIBAC TSA were not available, nor were the mid-term harvest volumes provided in the MOFR report, a key component of this project was the identification of an appropriate mid-term harvest level to apply the % impacts for each TSA. Following the assumptions used by the MOFR, the mid-term harvest projection which corresponds to the most recent pre-infestation timber supply analysis and as much as possible minimizing double counting the MPB impacts (ie. excluding analysis that incorporates MPB spread, kill and loss) was selected.

In order to determine the potential post-MPB timber supply for each SIBAC TSA, the percentage impact ranges summarized above were applied to the appropriate mid-term timber supply volumes to provide a future mid-term timber supply range post-MPB.

The appropriate mid-term timber supply was identified by reviewing the available timber supply analysis reports (Timber Supply Review or IFPA) for each SIBAC TSA to identify the analysis report which corresponds to the most recent pre-MPB TSR which excluded MPB attack, spread and kill assumptions but included significant changes in harvest projections based on information improvements (including inventory updates, site productivity improvements, genetic gains, and land base constraints) especially for Merritt and Okanagan TSAs. These mid-term timber supply volumes were reviewed by the MOFR and revised where necessary. While the source TSRs and respective harvest level projections for each TSA are of differing vintages and varying mid-term time periods, the MOFR considered the mid-term to be 21-60 years in the future.

Table 3. Calculated mid-term harvest for MPB Impact Scenarios 1 and 2 for SIBAC TSAs

TSA	Mid-Term Harvest Level	MPB Impact Scenario 1		MPB Impact Scenario 2	
		Low Impact (m3/yr)	High Impact (m3/yr)	Low Impact (m3/yr)	High Impact (m3/yr)
Arrow	493,000	448,630	394,400	389,470	147,900
Boundary	749,000	591,710	524,300	441,910	539,280
Cranbrook	559,000	385,710	335,400	329,810	402,480
Golden	440,000	347,600	308,000	347,600	132,000
Invermere	542,570	374,373	325,542	320,116	390,650
Kamloops	2,361,900	1,629,711	1,417,140	1,393,521	1,700,568
Kootenay Lake	605,000	550,550	484,000	477,950	181,500
Lillooet	572,900	452,591	401,030	338,011	412,488
Merritt	1,695,500	1,169,895	1,017,300	1,000,345	1,220,760
Okanagan	2,550,000	2,320,500	2,040,000	2,014,500	765,000
Revelstoke	165,000	0	0	0	0

Based on discussions within SIBAC and MOFR it is expected that Scenario 1 is more reflective of future management and harvest priority in the MPB impacted TSAs. While this may or may not be consistent with eventual future activity and outcomes, Scenario 2 is overly pessimistic; and when viewed together both scenarios cover the spectrum of future harvest post-MPB. This range is informative, given the uncertainties that exist with respect to the progression of the MPB, the resulting quality and utility of the attacked fibre and government and industry’s collective response.

Considering their pine component and the % impacts the SIBAC TSAs with the highest risk to mid-term timber supply are Lillooet, Merritt, Kamloops and Cranbrook TSAs.