



Ministry of Forests, Lands and Natural Resource Operations

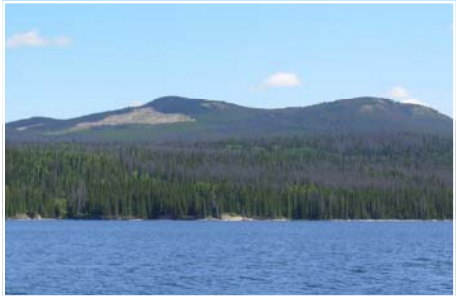
Lakes Timber Supply Area

Technical Working Group Report

Mid-Term Timber Supply Project for the Lakes,
Prince George, Quesnel and Williams Lake Timber
Supply Areas



November 18, 2011

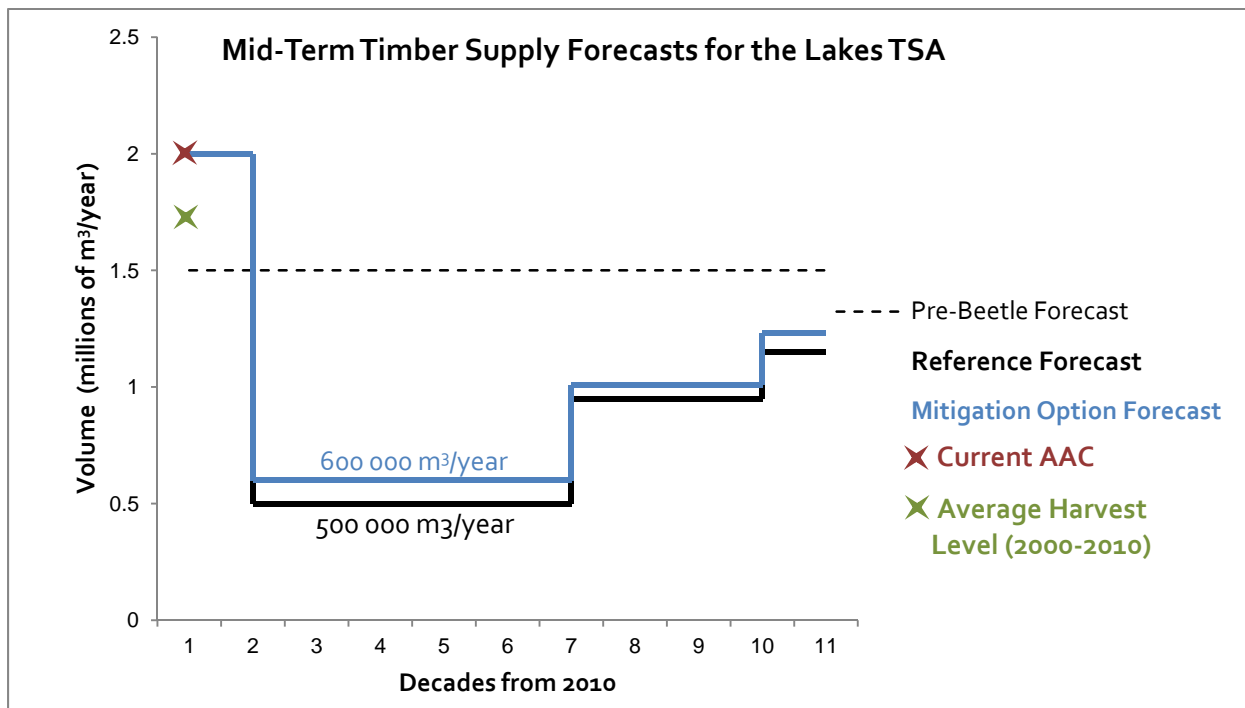


EXECUTIVE SUMMARY

The mountain pine beetle (MPB) epidemic is a natural disturbance agent that is affecting the forest ecosystems in large portions of British Columbia. Affected ecosystems still provide for a variety of functions and services which include lumber production, clean water and habitat for plants and animals. However, the MPB is impacting the capacity of the forest ecosystems to continue to provide for timber supply in the mid-term. In effect, the mountain pine beetle will result in significant decrease in timber supply. This decrease in timber supply will in turn have negative socio-economic effects on the forest industry and on forestry-dependent communities.

As part of a project aimed at exploring opportunities to mitigate the projected decline in mid-term timber supply, analyses were undertaken in four timber supply areas (TSAs): Williams Lake, Quesnel, Prince George and Lakes. For the Lakes TSA, these analyses forecast a mid-term harvest level of 0.5 million cubic metres per year. The pre-mountain pine beetle timber supply projection for the mid-term (2020 to 2070) was 1.5 million cubic metres per year and the current allowable annual cut is set at 2 million cubic metres per year.

Mitigation opportunities explored as part of this project fall within two distinct categories: forest sector management practices and administration opportunities, and relaxation or deferral of objectives for non-timber forest values. While the technical working group solicited licensee input to evaluate potential opportunities, none other than those currently implemented (e.g. focusing harvest in pine and fertilization of young plantations under the LBIS) were identified under the forest sector management practices and administration category for the Lakes TSA.



On the other hand, a number of opportunities related to the relaxation of objectives for non-timber values were identified based on licensees input. These opportunities could increase mid-term timber supply by 100 000 cubic metres per year (from 0.5 million cubic metres per year to 0.6 million cubic metres per year). This increase would require relaxation of visual quality objectives by one category throughout the TSA, harvesting of all old growth management areas (OGMAs) except for those near Chief Louis Lake, Uduk Lake and Tetachuck Lake, a redefinition of old seral, the elimination of early seral requirements, the harvesting of wildlife connectivity corridor and changes to management practices for caribou and moose.

An opportunity related to forest management practices was also identified based on input from MFLRNO experts. With this opportunity, about one-third of an increased timber harvesting land base (THLB) would be managed with uneven-age systems. Although sensitivity analyses were not conducted for this opportunity, the mid-term harvest levels could be increased above the reference forecast level of 500 000 cubic metres per year. The increase would require amendments to allow partial harvest within OGMAs. Increased funding for silviculture and intensive management is also part of this opportunity.

The table below compares four different timber supply scenarios in terms of volume availability, legal or policy changes that each scenario would require for implementation and in terms of implications to non-timber values:

Scenario	Harvest (cubic metres per year)	Period for which Volume is Available for Harvest	Change to Volume Available for Harvest Compared to Reference Forecast	Harvest Gap Compared to Pre-Beetle Forecast	Legal/Policy Implications	Non-Timber Value Implications
Pre-Beetle Forecast	1 500 000	All	n/a	n/a	n/a	n/a
Scenario 1 (Reference Forecast)	2 000 000	Short-term	n/a	+ 33%	Meets current legislation/policy	Meets current management requirements
	500 000	Mid-term	n/a	- 67%	Meets current legislation/policy	Meets current management requirements
Scenario 2 / Scenario 3 (Mitigation opportunities suggested by forest licensees)	2 000 000	Short-term	0%	+ 33%	Meets current legislation/policy	Meets current management requirements
	600 000	Mid-Term	+ 20%	- 60%	Amendments required to Land Use Act Amendment Required under GAR Amendment Required to FPPR 7(2)	Loss of old growth Reduced visual integrity for recreation, tourism, well-being Impact to watershed-level hydrological integrity

						Loss of winter habitat for moose Loss of habitat for caribou Loss of structural diversity at the landscape level Loss of cultural and spiritual opportunities
Scenario 4 (Uneven-age Management Scenario)	2 000 000	Short-term	0%	+ 33%	Meets current legislation/policy	Meets current management requirements
	Between 500 000 and 600 000	Mid-Term	+ 0-20%	- 60% to - 67%	Amendments required to Land Use Act	Meet/exceed current management requirements

The changes that would be required to implement scenario 2 or scenario 3 are summarized in the table below. Together, these mitigation opportunities could potentially increase mid-term timber supply by 100 000 cubic metres per year. The table also summarizes the changes that would be required to implement scenario 4.

Scenarios 2 or Scenario 3						
Potential Increase to Mid-Term Timber Supply	Non-Timber Value	Zone	Legal Changes Required	Consultation and Review Requirement	Decision-Maker and Amendment Timing	Non-Timber Implications
10 000 m ³ /year	Visual Quality	All	Government Actions Regulation Amendment (GAR 7(2)) ¹	Review/Comment with holders of agreements under the Forest Act or the Range Act (GAR 3 (1)(b)) Consultation with with holders of agreements under the Forest Act or the Range Act with whom the order may have a material adverse effect (GAR 3 (2)) First Nations Consultation	District Manager By 2020	Reduced aesthetic and spiritual integrity for tourism and recreation Government studies indicate that the public prefers unaltered landscapes
	Patch Size	Southern half of the TSA	Land Use Act Amendment (Land Act 93.4)	Public Review and Comment (Land Act 93.6 (1))	Regional Executive Director	Impact to watershed-level hydrological

			for Lakes South SRMP	First Nations Consultation	By 2020	integrity Potential loss of structural diversity at the landscape level May not reflect patterns of natural disturbances that occur within the landscape
Connectivity Corridors	Southern half of the TSA	Land Use Act Amendment (Land Act 93.4) for Lakes South SRMP	Public Review and Comment (Land Act 93.6 (1)) First Nations Consultation	Regional Executive Director By 2020	Loss of habitat structure and ecosystem services (distribution of species, population and genetic material)	
Old Growth Definition	All	Land Use Act Amendments (Land Act 93.4) for Lakes South and Lakes North Sustainable Resource Management Plans	Public Review and Comment (Land Act 93.6 (1)) First Nations Consultation	Regional Executive Director By 2020	Loss of old growth Loss of structural diversity at the landscape level Loss of opportunity for biodiversity conservation May affect cultural resources	
Drop early seral requirements	All	Land Use Act Amendments (Land Act 93.4) for Lakes South and Lakes North Sustainable Resource Management Plans	Public Review and Comment (Land Act 93.6 (1)) First Nations Consultation	Regional Executive Director By 2020	Impact to watershed-level hydrological integrity Potential loss of structural diversity at the landscape level Does not reflect patterns of natural disturbances that occur within the landscape	
Change seral stage target for caribou	South of Ootsa Lake	Land Use Act Amendment (Land Act 93.4) for Lakes South SRMP	Public Review and Comment (Land Act 93.6 (1)) First Nations Consultation	Regional Executive Director By 2020	Loss of habitat for caribou Caribou is a species at risk There may be implications related to the Species at Risk Act.	

	Eliminate moose management requirements	All	GAR order (if creating UWR under GAR 12) Amendment to FPPR 7(2) Notices for species at risk and for ungulates species	If GAR, similar to VQO above	Minister responsible for the Wildlife Act (if GAR) Director, Ecosystem Protection and Sustainability, MOE (if amendment to FPPR 7(2) Notice) By 2020	Loss of winter habitat for moose and uncertainty as to long-term shrub supply May impact aboriginal interests
90 000 m ³ /year	Old Growth Management Areas	All	Land Use Act Amendments (Lakes South and Lakes North Sustainable Resource Management Plans)	Public Review and Comment (Land Act 93.6 (1)) First Nations Consultation	Regional Executive Director By 2020	Loss of old growth Loss of structural diversity at the landscape level May impact aboriginal interests Loss of opportunity for biodiversity conservation Loss of habitat for old-growth dependent species

Scenario 4

Potential Increase to Mid-Term Timber Supply	Non-Timber Value	Zone	Legal Changes Required	Consultation and Review Requirement	Decision-Maker and Amendment Timing	Non-Timber Implications
< 100 000 m ³ /year	Old Growth Management Areas	All	Land Use Act Amendments (Lakes South and Lakes North Sustainable Resource Management Plans)	Public Review and Comment (Land Act 93.6 (1)) First Nations Consultation	Regional Executive Director By 2020	Enhancement of biodiversity value through creation of gaps and small openings

(1) A number of limitations apply to government actions. One of these limitations is that the decision-maker must be satisfied that (a) the benefits to the public derived from the order outweigh any material adverse impact of the order on the delivered wood costs of a holder of any agreement under the Forest Act that would be affected by the order and (b) undue constraint on the ability of a holder of an agreement under the Forest Act or the Range Act that would be affected by the order to exercise the holder's rights under the agreement.

LAKES TIMBER SUPPLY AREA TECHNICAL WORKING GROUP FINAL REPORT

INTRODUCTION

Timber supply analyses have shown significant mid-term timber supply shortfalls in areas affected by the MPB infestation. Preliminary analyses completed for the Williams Lake, Quesnel, Prince George and Lakes timber supply areas have revealed potential opportunities for decreasing mid-term supply impacts through review and modification of the following factors:

- Forest sector management practices and administration: regeneration/reforestation, fertilization, stand merchantability/economics and operating areas; and
- Deferral or relaxation of objectives for other forest values: visual quality objectives, wildlife habitat, and biodiversity.

As potential opportunities are unique to each TSA, a Technical Working Group was formed for each of the four TSAs to examine mitigation opportunities and their related implications. In doing so, the Lakes TSA Technical Working Group gathered TSA-specific timber supply, economic, forest management and land use information. The group also met with local forest licensee experts and solicited their advice.

The services provided by forested ecosystems are highlighted below. The biophysical and economic situation of the Lakes timber supply area is also described in this document along with its land use management objectives and anticipated mid-term timber supply shortfalls. It also provides an overview of a range of options for mitigating mid-term timber supply shortfalls in the Lakes TSA and explores implications related to these options. The document was prepared for the Provincial Mid-Term Timber Supply Oversight Committee by the Lakes TSA Technical Working Group as part of the Mid-Term Timber Supply Project.

ECOSYSTEM SERVICES AND FOREST RESOURCES

The forest resources of British Columbia, as well as the forest resources of the Lakes TSA, provide many benefits to people. These include:

- Wood for lumber, pulp and fibre production;
- Non-timber forest products such as mushrooms;
- The regulation of the timing and magnitude of peak flows, which have implications on flooding, channel stability and fish habitat;
- Clean water for human consumption, for fish, and for other aquatic organism;
- Habitat for plants and animals, which includes shade and shelter from the weather and predators;

- The regulation of carbon cycles; or
- Spiritual, aesthetic, recreational and educational opportunities.

It has been suggested that the MPB has affected the services provided by forested ecosystems. Human understanding of the complex functions of forested ecosystems and of the MPB impacts on these functions is limited. Because of this, it has also been suggested that a prudent approach to sustain genetic and functional diversity is to keep a mix of ecosystems over the landscape, even in areas affected by the MPB.

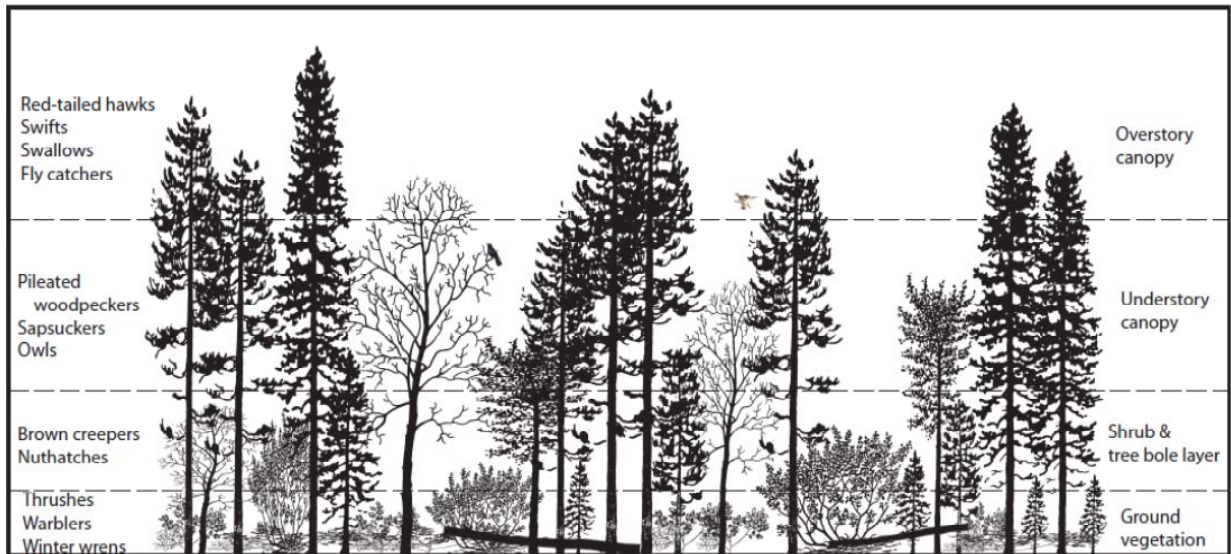


Figure 1. Mature/Old Forest Structure and Associated Diversity

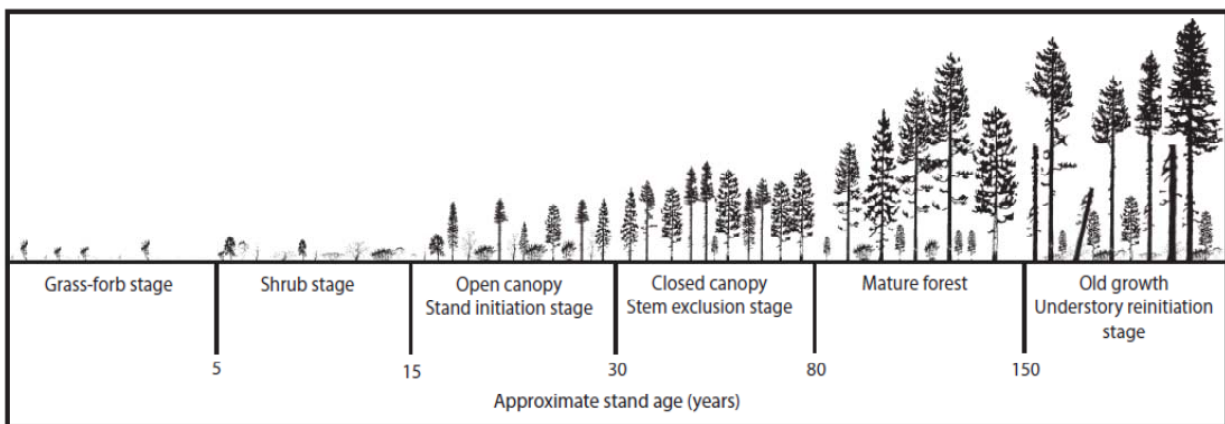


Figure 2. Interior Stand Conditions over Time

Further, forest harvesting generally increases the amount of young forest and decreases the amount of older forest, because commercial forest rotations are generally shorter than natural disturbance return periods. Therefore, the more that managed forests diverge from natural disturbance regimes, the greater the risk of loss of biodiversity. Moreover, the composition of plant and animal

communities changes as forest stands develop through time after a disturbance. Most specialist species are associated with either the early herb/shrub stage or the mature to old seral stages. Most species are also associated with non-pine species, particularly in rich riparian areas.

There remain considerable uncertainties as to the MPB impacts on ecosystem functions. However, a study conducted by the Forest Practices Board suggests that both the infestation and salvage logging of beetle-infested trees can significantly increase stream flow as well as flood magnitude and frequency. The MPB infestation is also expected to have socio-economic impacts as the majority of the wood projected to be harvested within the next decades has been killed and will soon lose its economical value.

DESCRIPTION OF THE LAKES TIMBER SUPPLY AREA

The Lakes TSA (Figure 1) covers approximately 1.1 million hectares of land, of which about 72 percent is considered productive forest, outside of First Nations reserves, private lands, woodlots, and community forests (Table 1). Of that productive forest, about 26 percent is not available for timber harvesting purposes because it is reserved for biodiversity, fish or wildlife or because the productivity of the site is too low to grow trees quickly. The current timber harvesting land base (THLB) is approximately 524 000 hectares, which is about 46 percent of the TSA area.

Table 1. Lakes TSA Timber Harvesting Land Base

Classification	Productive forest area by classification (hectares)	Area (hectares)	Per cent (%) of total TSA area	Per cent (%) of Crown forest land
Total TSA area		1121609	100	
Not managed by the B.C. Forest Service		157020	14	
Non-forest		154014	13.7	
Total productive forest managed by the Forest Service (Crown forest)		810575	72.3	100
Reductions to Crown forest:				
Existing roads, trails and landings		10028	0.9	1.2
Riparians		12972	1.2	1.6
Protect area	96911	95138	8.5	11.7
Wildlife/Mineral Zone	263	251	0	0
OGMA	72558	70204	6.3	8.7
Sites with low productivity	27513	26885	2.4	3.3
Deciduous	46042	44792	4	5.5
balsam > 250 year old	1668	1640	0.1	0.2
WTP		24759	2.2	3.1
Total current reductions		286668	25.6	35.4
Current timber harvesting land base		523909	46.5	64.6
Future reductions				
Future roads		11342	1	3.8
Long-term timber harvesting land base		512567	45.7	63.2

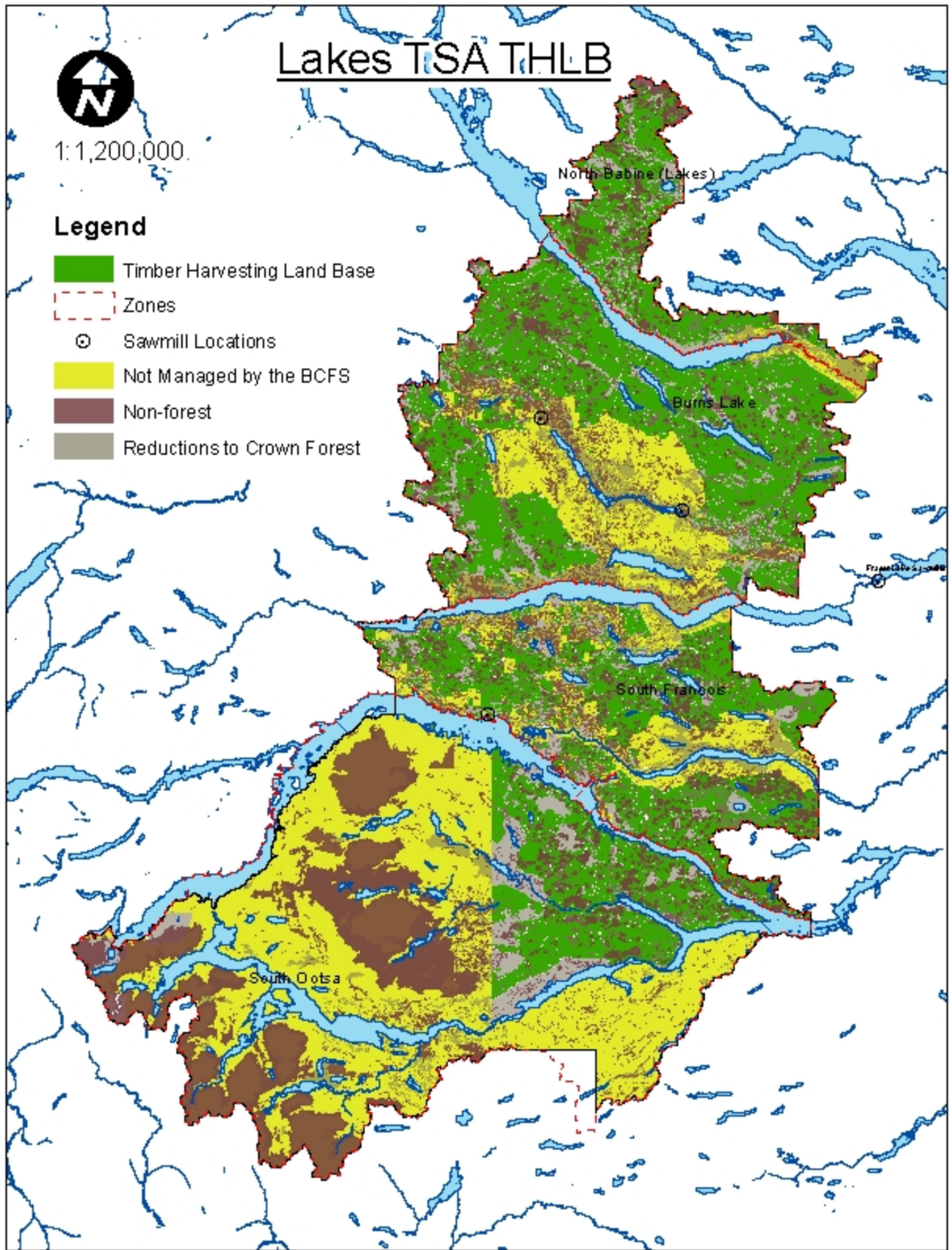


Figure 3. Lakes Timber Supply Area Timber Harvesting Land Base

LAND USE PLANNING

Three government-approved higher level plans are in place for the Lakes TSA: the Lakes District Land and Resource Management Plan (LRMP), the Lakes South Sustainable Resource Management Plan (LS SRMP), and the Lakes North Sustainable Resource Management Plan (LN SRMP). Each one of these plans was approved after considerable analysis, scientific review, and debate by various individuals and groups who carefully negotiated a balance.

The LRMP, approved in 2000, provides general management directions for values occurring in the area. The plan led to the creation of new protected areas and the establishment three resource management zones and resource management objectives: Resource Management Zone A where specific objectives aimed at maintaining early, mature plus old and old seral stages apply; the Chelaslie Caribou Migration Corridor (Zone B) where objectives aimed at maintaining seral stages vary based on habitat use by the caribou; and Resource Management C, which is a small and isolated wildlife and mineral management zone.

The purpose of the Lakes South SRMP, approved in 2003, is to implement specific watershed scale LRMP directions, manage the mountain pine beetle infestation and respond to the increase in AAC. The LS SRMP thus confirms the seral stage distribution targets for the southern portion of the TSA, which includes the caribou migration corridor, and introduces land use objectives for old growth management areas, habitat connectivity, patch size distribution, and wildlife tree retention.

Finally, the Lakes North SRMP, approved in 2009, was prepared to implement specific watershed scale LRMP directions, manage the MPB infestation and respond to the increase in AAC for the remaining northern portion of the TSA. The purpose of the plan is also to support the implementation of the *Forest and Range Practices Act* (FRPA). The LN SRMP includes objectives for seral stage distribution, old growth management areas, habitat connectivity and stand level structural diversity.

HISTORY OF THE ALLOWABLE ANNUAL CUT AND HARVEST PERFORMANCE

Between 1982 and 1996, the AAC was set at 1 500 000 cubic metres. In 2001, the AAC was increased to 2 962 000 cubic metres in response to the MPB epidemic, and further raised to 3 162 000 cubic metres in 2004. The current AAC, which took effect July 12, 2011, is 2 000 000 cubic metres (Figure 2).

During the last four years (2006 to 2010), an average of about 67 percent of the AAC has been harvested. For the duration of that period, about 78 percent of the harvested volume was pine.

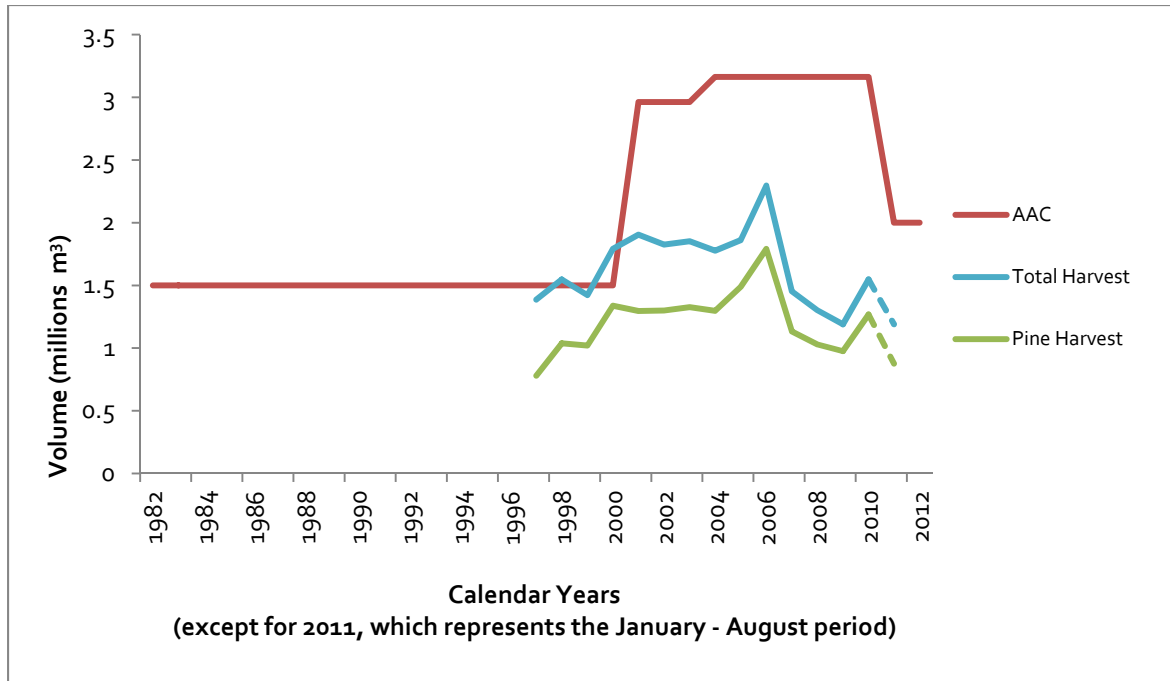


Figure 4. Lakes AAC and Volume Harvested over the Years

ECONOMY AND EMPLOYMENT

The Lakes TSA includes the Village of Burns Lake and numerous smaller communities, including Decker Lake, François Lake and Grassy Plains. In addition it includes the communities of Lake Babine Nation, Skin Tyee Nation, Nee Tahí Buhn First Nation, Cheslatta Carrier Nation, Wet'suwet'en First Nation (Broman Lake Band) and Burns Lake Band.

According to the 2006 Census of Canada, the population in the Lakes TSA and surrounds, estimated at 7880, has increased since 2000, unlike most other areas in the north-central to west central portion of the province. The population of the community of Burns Lake increased by about 9 percent from the year 2000 (1 938) to 2009 (2 114). This increase was in contrast to communities such as Houston, Vanderhoof or Smithers where the population declined by about 23%, 10%, and 5%, respectively. Between 2009 and 2020, the population of the Burns Lake Local Health Area is projected to increase by a modest 1 percent. These population estimates do not include estimates for First Nations living on reserves.

Table 2 illustrates the workforce statistics for the Nadina Forest District. There is no data available for the Lakes TSA so this information is heavily influenced by both the demographics of Granisle and Houston. The declining labour force depicted in Table 2 may reflect changes in the Morice TSA where population has been falling, rather than the Lakes TSA where population levels have remained strong.

Table 2: Nadina District, labour force by selected sub-sectors, Census of Canada, 2001 and 2006.

Nadina Forest District sub-sectors	2001	2006	%change 2001-06
Forest sector	2035	1880	-8%
Manufacturing (non-forestry)	25	10	-60%
Mining/oil/gas	155	150	-3%
Wholesale/retail	670	655	-2%
Accommodation and food services	355	315	-11%
Transportation	215	290	35%
Health and education	725	760	5%
Public administration	375	300	-20%
All Industries - Total	6005	5800	-3%

Source: BC Stats. Note: the table includes a selection of sub-sectors as such the sub-sector total does not equal the all industries total.

A total of 37% of the after tax income of the Lakes TSA (Burns Lake local area) is provided by the forest industry. Table 3 provides the latest economic dependency data for the Nadina District based on the 2006 Census of Canada. In terms of basic employment and income, the forest sector remains the single most important sector in the TSA's economy. In contrast to the Morice TSA where the forestry sector overwhelmingly dominates the local economy, in the Lakes TSA a relatively large public sector provides over one-quarter of the income flowing into the region. Transfer and other non-labour income, which includes pensions, investments and social safety-net payments, are also larger contributors in the Lakes TSA, helping to further diversify spending and economic activity.

Table 3: Nadina District basic employment and after-tax income, 2006.

	Forestry	Mining & Min Proc	Agric. & Food	Tourism	Public Sector	Const	Other	Transfer and other non-labour income
Nadina Forest District								
Basic Employment by Sector	46%	3%	5%	11%	29%	5%	1%	na
After Tax Income by Sector	45%	3%	2%	4%	21%	3%	1%	22%
Burns Lake local area								
After Tax Income by Sector	37	3	3	3	26	3	2	23
Houston local area								
After Tax Income by Sector	58	7	1	3	12	3	0	16

Source: Garry Horne (2009) "Economic dependency tables for forest districts" and "British Columbia local area economic dependencies, 2006. http://www.bcstats.gov.bc.ca/pubs/econ_dep.asp

Two operating sawmills are located within the Lakes TSA – Babine Forest Products with an annual capacity of 900 000 cubic metres and Decker Lake Forest Products with an annual capacity of 350 000 cubic metres. Both of these mills are owned by Hampton Lumber Mills, and are currently running at full capacity. In addition the TSA supports two pellet plants: Pinnacle Renewable

Energy Group that has a current annual capacity of 700 000 cubic metres (300 000 BDT), and Tahtsa Pellets Ltd. with a current capacity of 40 000 metric tons.

The TSA also supplies approximately one-third of the annual capacity requirements for Fraser Lake Sawmill (West Fraser), a portion of the requirements for Pacific Inland Resources in Smithers (West Fraser) and Canfor Houston. Minor supply is provided to Houston Forest Products (West Fraser) and L&M Lumber in Vanderhoof. Within the boundaries of the Lakes TSA, timber is also supplied from approximately 40 woodlots and two large community forest agreements. Because of this, the fibre in the Lakes TSA is highly driven by market and supplies many mills that are not within the TSA.

MID-TERM TIMBER SUPPLY – REFERENCE FORECAST AND SENSITIVITY ANALYSES

The reference timber supply forecast prepared for this project included all existing land-use decisions, applied all non-timber value constraints, focused harvest in pine-leading stands and assumed that the dead pine retained economic value for 20 years after death. This forecast indicates that the beginning of the mid-term depends on how much longer MPB-killed stands can be economically harvested. The mid-term generally ends when a significant amount of the existing stands reach merchantable size, which will take about 50 years.

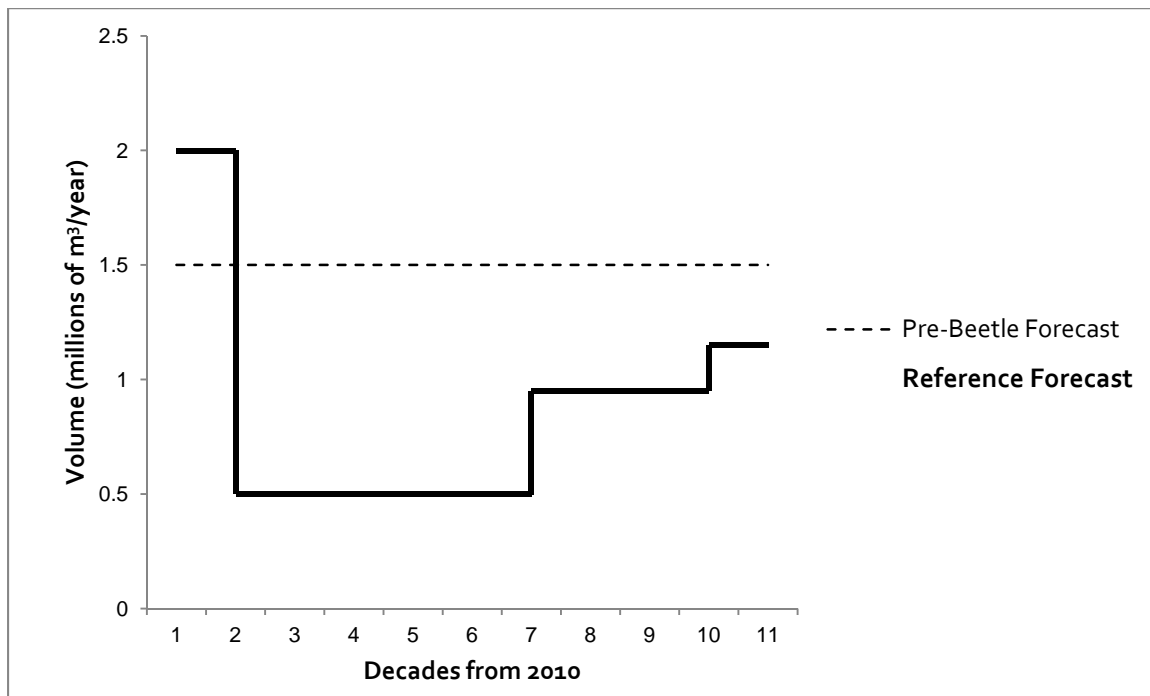


Figure 5. *Lakes TSA Reference Forecast for the Mid-Term Timber Supply Project*

The initial harvest level in the reference forecast is 2.0 million cubic metres per year (Figure 3), which is also the current AAC. This level can be maintained until 2020 before declining to 0.5 million cubic metres per year for the next 50 years. During the mid-term, harvest in the Lakes TSA will be entirely dependent on existing spruce stands, advanced pine plantations, and surviving pine stands. The mid-term harvest level of 500 000 cubic metres per year is significantly lower than the current AAC of 2 000 000 cubic metres per year and is also significantly lower than the current average annual harvest levels of 1 600 000 cubic metres per year.

This falldown is expected to have significant economic and social ramifications to the forest industry and forestry-dependent communities. To potentially mitigate the mid-term timber supply impact, opportunities have been identified in the areas of forest sector management practices and administration, as well as relaxation or deferral of objectives for other forest values.

Relaxation or deferral of objectives for other forest values

There are two types of harvesting constraints associated with non-timber values objectives. With the first type of constraints, areas are removed from the THLB and are unavailable for harvest (e.g. OGMAs). Areas associated with the second type of constraints are within the THLB and have defined disturbance percentages (e.g. VQOs), which restrict the rate of harvest as compared to unconstrained THLB.

Table 5 shows the results of sensitivity analyses that examined the impact of eliminating the following non-timber value constraints: eliminating the cutblock adjacency requirement, eliminating visual quality requirements, eliminating requirements for wildlife tree patches and riparian area management, eliminating wildlife habitat requirements and eliminating old growth management areas (OGMAs). Note that each factor was assessed separately. Therefore, the volume increases are not cumulative and do not account for potential overlap with other factors.

Following initial review of these results, forest licensees requested an additional timber supply forecast. This additional timber supply forecast prioritized harvesting (and regeneration) in stands with the highest site index, and extended shelf-life to 25 years on medium and poor sites. The results show that since past harvesting was already concentrated on good sites and since 70 percent of the remaining pine stands and 50 percent of spruce stands on good sites were harvested within the first decade of the forecast, the impact of changing the harvest priority was negligible.

Extending the shelf-life by 5 years resulted in the mid-term timber supply increasing by 40 000 cubic metres per year.

Table 5 Results of sensitivity analysis on selected relaxation or deferral of non-timber objectives opportunities

Mitigation Opportunity	Type of Constraint	Total Area (ha)	Pine-leading Volume (m ³)	Non-pine Leading Volume (m ³)	Mid-Term Harvest Volume Impact (m ³)	Base Case Volume (m ³)	Percent Volume Increase (%)
Eliminate cutblock adjacency	Rate of harvest	n/a	n/a	n/a	15 000	500 000	3
Eliminate VQO requirements – without additional constraints	Rate of harvest	101 640	11 753 919	5 572 634	n/a	-	n/a
Eliminate VQO requirements - with additional constraints	Rate of harvest	111 569	11 165 601	7 933 680	n/a	-	n/a
Total VQO	Rate of harvest	213 209	22 919 520	13 506 520	300	500 000	0
Eliminate adjacency and VQO constraints	Rate of harvest	n/a	n/a	n/a	17 000	500 000	3.4
Eliminate requirements for riparian areas and wildlife tree patches	THLB	n/a	n/a	n/a	50 000	500 000	10
Eliminate OGMAs - without additional constraints	THLB	21 585	2 972 624	1 669 132	n/a	-	n/a
Eliminate OGMAs - with additional constraints	THLB	39 611	5 604 497	1 154 903	n/a	-	n/a
Eliminate OGMAs	THLB	61 196	8 577 121	2 824 035	90 000	500 000	18
Eliminate wildlife habitat requirements (moose, deer, grizzly and caribou)	Rate of harvest	204 203	21 926 424	11 602 877	0	500 000	0

Forest sector management practices and administration opportunities

Timber supply sensitivity analyses conducted as part of this project examined changes in volume attributable to various management practices and administration opportunities (see Table 4):

- Fertilizing all stands aged 30-50 years could increased the mid-term harvest level by about 20 000 cubic metres per year, which represents a 3 percent increase compared to the reference forecast;

- Reducing the minimum harvestable volume from 140 cubic metres per hectare to 100 cubic metres per hectare could potentially increase the mid-term harvest level by 60 000 cubic metres per year – a 12 percent increase compared to the reference forecast prepared for this project;
- Harvesting low productivity sites could potentially increase the mid-term harvest level by 15 000 cubic metres, or by 3 percent compared to the reference forecast; and
- Harvesting deciduous stands could increase the mid-term harvest level by 26 percent, or about 130 000 cubic metres per year.

Note that each factor was assessed separately. Therefore, the volume increases are not cumulative and do not account for potential overlap with other factors.

Table 4 Results of sensitivity analysis on selected forest sector management practices and administration opportunities

Mitigation Opportunity	Total Area (ha)	Pine-leading Volume (m³)	Non-pine Leading Volume (m³)	Mid-Term Harvest Volume Impact (m³)	Base Case Volume (m³)	Percent Volume Increase (%)
Fertilize all stands 20 to 50 years old				20 000	500 000	4
Reduce minimum harvestable volume from 140 m ³ /ha to 100 m ³ /ha				60 000	500 000	12
Harvest sites with low productivity – without additional constraints	8999	915 626	405 900	n/a	-	n/a
Harvest sites with low productivity – with additional constraints	6332	487 175	230 228	n/a	-	n/a
Total for sites with low productivity	15 331	1 402 801	636 128	15 000	500 000	3
Harvest deciduous-leading stands – without additional constraints	8513	n/a	1 011 243	n/a	-	n/a
Harvest deciduous-leading stands – with additional constraints	37 524	n/a	4 535 967	n/a	-	n/a
Total for deciduous-leading stands	46 037	n/a	5 547 210	130 000	500 000	26

DISCUSSION

Relaxation or deferral of objectives for other forest values

A number of management objectives for non-timber forest values are currently in place for the Lakes TSA. These objectives were achieved through much analysis, scientific review, and debate by diverse users and interest groups who carefully negotiated a balance. Modification of these objectives may require altering land use plans or orders, or issuing new orders under the Government Actions Regulation (GAR).

The Working Group and the licensees have examined the analysis results, as well as the recent *Post-Mountain Pine Beetle Recreational Usage Survey* report. From this, some scenarios that outline harvest timing, duration and zones were developed. These scenarios represent three distinct possible choices amongst a wide spectrum of possible choices. They are presented as options below in order to assess the potential implications of various choices and should not be construed as the only choices or recommendations.

SCENARIO/OPTION 1: Maintain the status quo

Under this option, no changes will be undertaken to modify management requirements for non-timber values to improve the supply of timber through the mid-term timber period.

Implications to timber availability:

- Based on recent timber supply analyses, mid-term harvest levels for the Lakes TSA are forecasted to be about 500 000 cubic metres per year.

Implication to non-timber resources/values (i.e., recreation, visual quality, wildlife, old growth, etc.):

- Under this option, non-timber values will continue to be managed based on current practices and knowledge.

Implications to administrative changes required:

- No administrative changes required

Implications to work with external experts:

- Continue discussions with affected communities and work done through OBAC to inform forest dependent communities of mid-term timber supply projections and of the role of non-timber values

Summary of stakeholder reactions:

- This option is consistent with stakeholder input as represented in the *Post-Mountain Pine Beetle Recreation Usage Survey* report (2011);
- Regarding visual quality objectives, this option is also consistent with provincial findings as represented in *Visual Impact of Mountain Pine Beetle Attack and Resulting Salvage Operations in*

British Columbia – A Public Perception Study (2010), and in the *State of British Columbia's Forests, Third Edition* (2010);

- Also regarding visual quality objectives, this option is consistent with input received by the Nadina District from provincial tourism groups and associations, and local tourism operators. Locally, input from public members not aligned with the tourism or forest industry indicates that about half of the respondents are generally supportive of this option.

SCENARIO/OPTION 2: Eliminate constraints associated with adjacency, visual quality objectives and moose winter habitat and modify constraints for old growth management, biodiversity and caribou

Under this option, constraints associated with cutblock adjacency, visual quality objectives (VQOs) and moose winter habitat would be eliminated and management requirements for old growth, biodiversity and caribou would be modified. This option, which is suggested by the licensees, bundles analysis methodology with various constraint modifications.

<i>Resource Value</i>	<i>Opportunity for mid-term shortfall mitigation</i>	<i>Geographic zone where mitigation opportunity apply</i>	<i>Period for application of mitigation opportunity</i>
Harvest Priority	Sites with highest productivity harvested first – “best of the worst first”	All	At all times
Cutblock Adjacency	Eliminate cutblock adjacency requirements	North Babine and Burns Lake	From now until 2040
Visual Quality Objectives	Eliminate all visual quality objectives	All	From now until 2040
Old Growth Management Areas	Repeal spatial OGMAs and replace with aspatial targets based on current old growth requirements. Change definition of “old” from 250 to 140 in the ESSF and from 140 to 120 in the SBS	All (including Chelaslie caribou migration corridor)	At all times
Patch Size	Eliminate patch size requirements	South François and South Ootsa	From now until 2040
Connectivity Corridors	Allow harvest of stands with more than 70% pine only within corridors and allow harvest of non-pine after 2018	South François and South Ootsa	Variable
Early Seral	Drop early seral requirements	All (include Chelaslie caribou migration corridor)	Until 2070
Mature and Old Seral Target	Reduce by 20% if and when constraint becomes binding	All, except for the Chelaslie caribou migration corridor	Until 2070
Caribou	For the High and Very High Migration Zones, replace seral distribution target with those in place for high BEO landscape units For the Moderate Migration Zone, replace seral distribution target with those in place for moderate BEO landscape units For the Low Zone, replace seral distribution target with those in place for low BEO landscape units	South Ootsa	Until 2070
Moose	Eliminate all management requirements	All	At all times

Implications to timber availability:

- This option would apply to all stands (pine-leading and non-pine leading);

- Additional volume would be made available in the mid-term. Analysis results show that mid-term harvest levels could be increased by about 100 000 cubic metres per year (see Option 3, below). There are no differences in terms of timber supply between Option 2 and Option 3.

Implication to non-timber resources/values (i.e., recreation, visual quality, wildlife, old growth, etc.):

Biodiversity - Cutblock Adjacency and Patch Size Requirements

- As long as seral stage distribution targets representative of the natural disturbance type for the ecosystem are present, along with OGMA, connectivity corridors and stand structure requirements in the form of wildlife tree retention, the spatial distribution of cutblocks can be subordinate. However, the temporal rate of harvest is extremely important and extensive conversion to young seral species should be avoided.

Visual Quality Objectives

- Eliminating visual quality objectives would negatively affect the tourism industry, although the extent to which tourism activities in the Lakes TSA would be affected is unknown. It is also unknown how changes in the Lakes TSA could affect the broader regional or provincial tourism industry.
- Eliminating visual quality objectives has the potential to impact recreational activities. According to the *Post-Mountain Pine Beetle Recreational Usage Survey*, most respondents “were strongly against relaxing visual quality objectives” (page 57).

Biodiversity - Old Growth (OGMAs)

- Non-spatial OGMAs have been an acceptable temporary alternative to OGMAs for many years, except where the amount of old growth that exists in the landscape unit is close to or below the target amount of old growth.
- Spatially explicit OGMAs maximize their value for biodiversity conservation or provide reserves for old growth-dependant species across the landscape (e.g. goshawk).
- Spatially explicit OGMAs can greatly contribute to old-growth habitat supply throughout the mid-term;
- Spatially explicit OGMAs can be strategically located to both maximize their value for biodiversity and minimize timber supply impacts. OGMAs within the Lakes TSA were designed to take advantage of existing old forest within special management zones (e.g. VQOs), habitat corridors and linkages, riparian reserves, or areas outside of the timber harvesting land base. About 65% of OGMA area within the Lakes TSA spatially overlaps other non-timber values or non-productive forests.
- In OGMAs and connectivity corridors the use of partial cutting systems that would result in the removal of single tree or the creation of gaps and small openings could enhance the biodiversity value of these areas while providing for timber supply. However, this would require caution and an adaptive management approach would be required to ensure the success of the uneven-age management approach to all timber and non-timber values

- Pine-dominated OGMA's lacking and abundance of old growth attributes or recruitment value could be harvested *and* replaced with OGMA's with higher old growth conservation values

Biodiversity - Old Age Definition

- Currently, a number of landscape units in the Lakes TSA have a deficiency of old-growth in the ESSF biogeoclimatic zone. This deficiency is a result of natural processes. Changing the definition of old would make more timber available in these zones.
- Age is a surrogate for structure. Older stands tend to have more structure and more plant and animal diversity.
- Current definitions of old are based on historic disturbance rates by biogeoclimatic zones.
- Changing the definition of old may also imply changing the definition of mature as the gap between 'old' and 'mature' is considerably reduced.

Biodiversity – Connectivity Corridors

- The proposed changes for connectivity corridor in the Lakes South SRMP area represent the requirements currently in place in the LN SRMP area. If implemented, connectivity requirements would be consistent across the TSA in the short-term.
- With reduced mature and older forests compared to historic conditions, connectivity corridors are an important aspect of biodiversity conservation as they connect wetland complexes, riparian stands, and the mature forests between them. This provides opportunities for the distribution of species, populations and genetic materials.
- Higher rates of harvesting within the connectivity corridors could result in habitat fragmentation. Fragmentation decreases the size of habitat blocks and increases isolation of these patches one from another. Increased fragmentation dramatically alters species and landscape relationships and usually increases the risk of extinction. Fragmentation results in isolated populations with decreased resiliency to changes in landscapes that are either human induced or caused by a changing climate. The long term effect of increasing landscape fragmentation is the decline of biodiversity, ecosystem resilience, and ecosystem services.
- Partial cutting (single tree/small group selection systems) could be used in the corridors to enhance habitat attributes while providing for timber.

Biodiversity – Early Seral

- Early seral stage requirements are important aspect of seral stage distribution, which is a critical aspect of biodiversity management.
- The goal of seral stage distribution is to support various organisms and their habitat needs during different stages of forest development. This is because the composition of plant and animal communities changes as forest stands develop through time after a disturbance. Most specialist species are associated with either the early herb/shrub stage or the mature to old seral stages.
- Forest harvesting generally increases the amount of young forest and decreases the amount of older forest, because commercial forest rotations are generally shorter than natural disturbance return periods. This effect is most pronounced in forest types that have the

lowest frequency of natural stand-initiating disturbance. Therefore, the more that managed forests diverge from natural disturbance regimes, the greater the risk of loss of biodiversity.

- Current management objectives already allow significantly higher amounts of early seral compared to estimated historic medians.
- Removing the early seral stage requirements could result in habitat simplification as it would convert mature and old seral stages faster than they can be replaced. Habitat simplification results in a prevalence of generalist wildlife species (e.g. black bear) that can easily adapt to almost any situation and a reduction in specialist species (e.g. barred owl, caribou). Habitat simplification has the overall effect of loss of biodiversity.
- Removing the early seral stage requirements could also result in increased stream flow as well as flood magnitude and frequency. Increased peak flows can alter stream channels, fish habitat and increase fine sediment delivery, particularly if there is insufficient riparian protection.

Wildlife - Caribou

- Licensees stated that caribou avoid dead fallen stands because they impede their movement and the ability to forage for terrestrial lichen, and suggest that an increase in logging, including its spatial distribution, would facilitate migration and movement.
- The question of whether caribou avoid dead stands remains uncertain as substantive fall down is only beginning.
- All else being equal, concentrations of dead-fall are not likely desirable for caribou habitat. However, since the caribou have lots of space and travel options in the landscape, prefer lower density stands which provide better forage, and since there are many wetlands, eskers and other routes, it is unlikely that migration will be more severely affected by dead-fall than by further extensive timber harvesting. Local site use, however, may well be affected, likely in a shifting mosaic through time.
- The area has historically been subject to large wildfires, and likely beetle outbreaks as well, yet caribou use has persisted.
- If additional harvesting was designed specifically for caribou habitat enhancement/restoration, it could be beneficial. This would not, however, be status-quo management. Use of partial cutting (e.g., gaps and small openings <1 ha) in the 'high' to 'moderate' use zones, targeted at dead pine in higher-density stands while maintaining surviving overstory, could be applied.
- The non-pine stands may be important to caribou in the future for alternative arboreal lichen forage.
- Roads and trails should be rehabilitated to minimize risk of acting as predator access routes and radio-collaring of caribou used to avoid harvesting while the area is in use by the animals.
- Under this option, caribou habitat would not be explicitly managed, but assumed under a revised seral stage distribution target. This revised seral stage distribution target would lower the threshold for old forests.

- The Chelaslie Caribou Migration Corridor (CMC) represents a significant portion of the fall, spring, and winter habitat of the Tweedsmuir-Entiako herd.
- The current management strategy is based on the results of monitoring radio-collared animals and on prioritizing portions of the CMC and habitat types based on relative use.
- The current seral stage objectives were intended to maintain a matrix dominated by mature stands (favoured by the caribou, especially on poor sites) in the Moderate and High use zones, and were also informed by the estimated historic disturbance rates.
- Those results were adapted into the Lakes South SRMP, including consideration of the mountain pine beetle outbreak. The view of the biologists involved in caribou research on the herd was that the beetle outbreak did not warrant substantive change to the management approach. However, some adjustment was justified – such as not counting beetle-impacted stands as early-seral and such as a suspension of the early-seral in the short-term (note – the short-term period envisioned ended in 2008).
- Some level of timber harvesting helps diversify habitat options, and the current SRMP allows for significant timber harvesting within the CMC.

Wildlife - Moose

- More information is needed to better understand how the proposed option for moose would affect its winter survival. Moose require forest cover for screening and thermoregulation purposes and to provide snow interception. Moose also requires an abundant supply of shrubs; long-term silviculture strategies may be needed.
- The moose population is currently believed to be declining in the Skeena region due to a variety of factors (e.g. increased access, increased female mortality, willow borer infestation). Any factors affecting habitat supply would potentially contribute to the current decline.

Implications to administrative changes required:

- Amendments to the Lakes South SRMP would be required under the Land Act to repeal the patch size distribution objective. This amendment would require consultation with the public and First Nations.
- A GAR process would be necessary to change VQOs. GAR also requires consultation with the public and with First Nations. Due to the scope of the proposed opportunity, a GAR process may also be necessary to repeal scenic areas.
- Amendments to the Lakes South SRMP and the Lakes North SRMP would be required under the Land Act to amend requirements for OGMA's and seral stage targets. Further amendments would be required under the Land Act to modify the LS SRMP requirements for connectivity corridors and for the Chelaslie caribou. These amendments would require consultation with the public and with First Nations.
- For the opportunity in moose habitat, the notice currently issued under section 7 of the FPPR would need to be amended. Alternatively, a UWR may need to be established, which would require a GAR process; and

- All administrative changes are taxing on government resources and are expected to take at least 12 months each to complete once started.

Implications to work with external experts:

- All existing requirements for non-timber values are consistent with current provincial and federal guidelines and legislation and also reflect current scientific knowledge.
- Current management objectives already allow significantly different amounts of biodiversity elements (e.g. early seral stage, wildlife tree retention, old growth) compared to historic medians.
- Work with tourism industry representatives would be necessary to assess the impact of relaxing VQO requirements over large areas on their revenues and client's expectations.

Summary of stakeholder reactions:

- This option is recommended by the forest industry to explore the benefits of bundling various forest management practices and changes to non-timber values.
- Based on the findings of the *Post-Mountain Pine Beetle Recreational Usage Survey*, riparian and wildlife values are rated more highly than recreational, timber and visual quality values.
- Regarding visual quality constraints, the *Post-Mountain Pine Beetle Recreational Usage Survey* report indicates that most respondents are strongly against relaxing visual quality objectives.
- Regarding visual quality objectives, this option is also consistent with provincial findings as represented in *Visual Impact of Mountain Pine Beetle Attack and Resulting Salvage Operations in British Columbia – A Public Perception Study* (2010), and in the *State of British Columbia's Forests, Third Edition* (2010).
- Also regarding visual quality objectives, this option is not consistent with input received by the Nadina District from provincial tourism groups and associations, and local tourism operators. Locally, input from public members not aligned with the tourism or forest industry indicates that about half of the respondents are generally supportive of this option.
- Implications to First Nations would need to be explored through a consultation discussion aimed at enhancing First Nations understanding of what this timber supply mitigation opportunity means.
- This option may require adjustments to certification commitments; and
- Specific implications to the SLA may have to be explored.

SCENARIO /OPTION 3: Modify constraints associated with adjacency, visual quality, old growth management, biodiversity and wildlife

This option, which is also suggested by the licensees, looks at reducing requirements for non-timber values to a lesser extent than Option 2:

<i>Resource Value</i>	<i>Opportunity for mid-term shortfall mitigation</i>	<i>Geographic zone where mitigation opportunity apply</i>	<i>Period for application of mitigation opportunity</i>
Harvest Priority	Sites with highest productivity harvested first – “best of the worst first”	All	At all times
Cutblock Adjacency	Only apply to 75% of the pine-leading stands and 50% of the spruce-leading stands	North Babine and Burns Lake	From now until 2040
Visual Quality Objectives	Relax visual quality objectives by one category	All	From now until 2040
Old Growth Management Areas	With the exception of the large OGMA’s near Chief Louis Lake, Uduk Lake and Tetachuck Lake, repeal spatial OGMA’s and replace with aspatial targets based on current old growth requirements. Change definition of “old” from 250 to 140 in the ESSF and from 140 to 120 in the SBS	All	At all times
Patch Size	Eliminate patch size requirements	South François and South Ootsa	From now until 2040
Connectivity Corridors	Allow harvest of stands with more than 70% pine only within corridors and allow harvest of non-pine after 2018	South François and South Ootsa	Variable
Early Seral	Drop early seral requirements	All (include Chelaslic caribou migration corridor)	Until 2070
Caribou	Reduce seral stage distribution targets by 20% if and when they become binding	South Ootsa	Until 2070
Moose	Eliminate all management requirements	All	At all times

Implications to non-timber values, administrative changes required, work with external experts and stakeholder reactions:

- Similar to Option 2.

Implications to timber availability

- In the short-term, up to 200 000 cubic metres per year – or 10 percent of the total harvest - could be from OGMA’s. However, timber supply analyses published in 2010 as part of the Lakes timber supply review indicate that it would be possible to harvest up to 3.1 million cubic metres per year of pine-leading stands in the short-term while maintaining all constraints and management requirements for non-timber values. The current AAC for the

Lakes is set at 2 million cubic metres per year and over the past 5 years (2006-2011), an average of about 1.8 million cubic metres per year has been harvested.

- The above suggests that this mitigation option would not affect short-term timber supply.
- This option would result in an additional 100 000 cubic metres per year over the mid-term period. Between decade 60 and 90, the timber supply would be 1 010 000 cubic metres per year, which is a 2 percent increase compared to the reference forecast.
- Most of the mid-term timber supply gain (90 percent) is due to the contribution of non-pine stands currently located in OGMA.
- Under Option 2 and 3, the growing stock is lower than in the reference scenario for most of the forecast period.

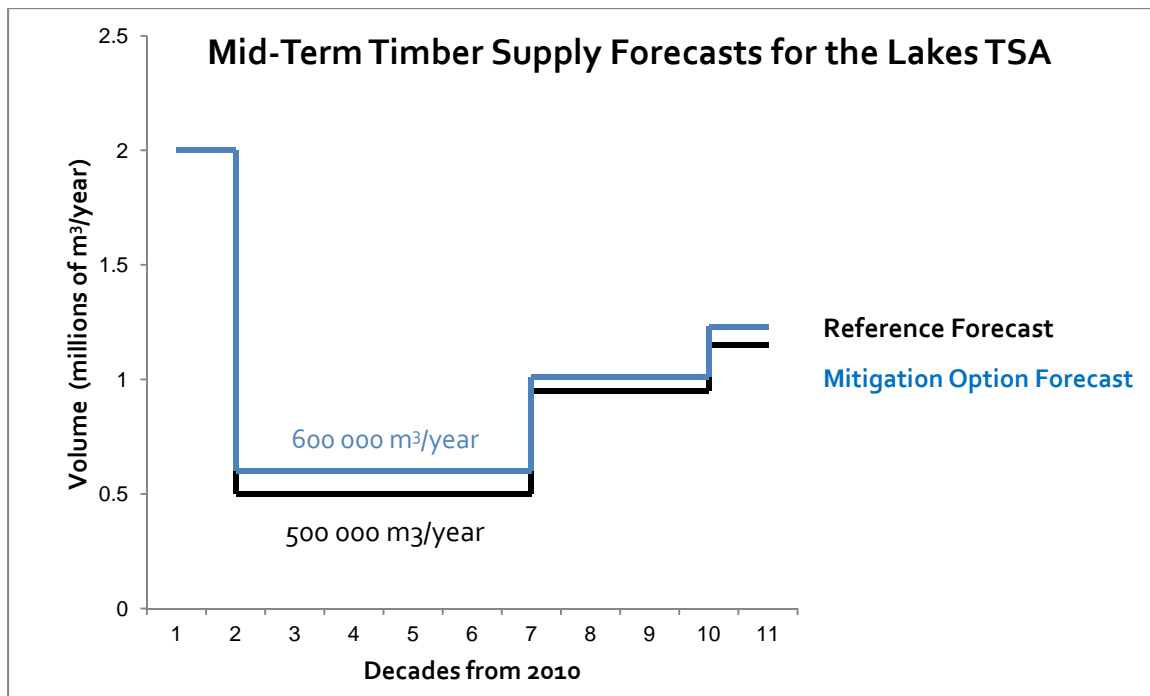


Figure 6 Timber Supply Forecast Based on Option 3 (in blue) Compared to the Reference Forecast (in Black)

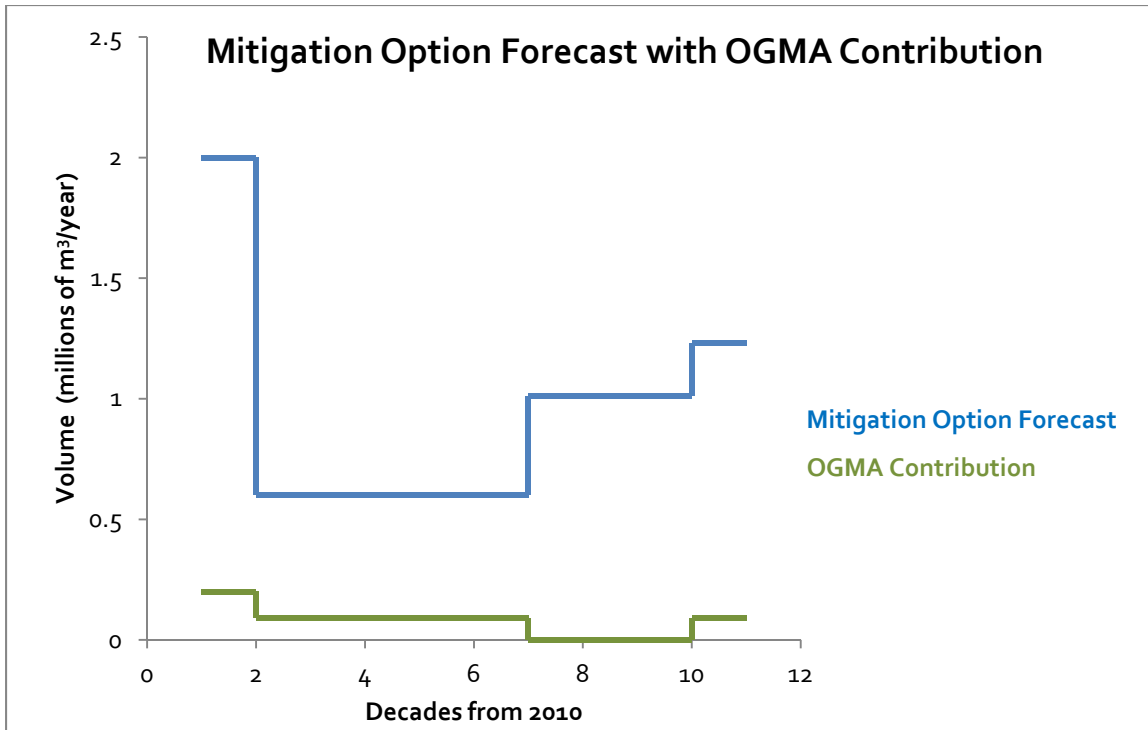


Figure 7 Mitigation Option Forecast with OGMA Contribution

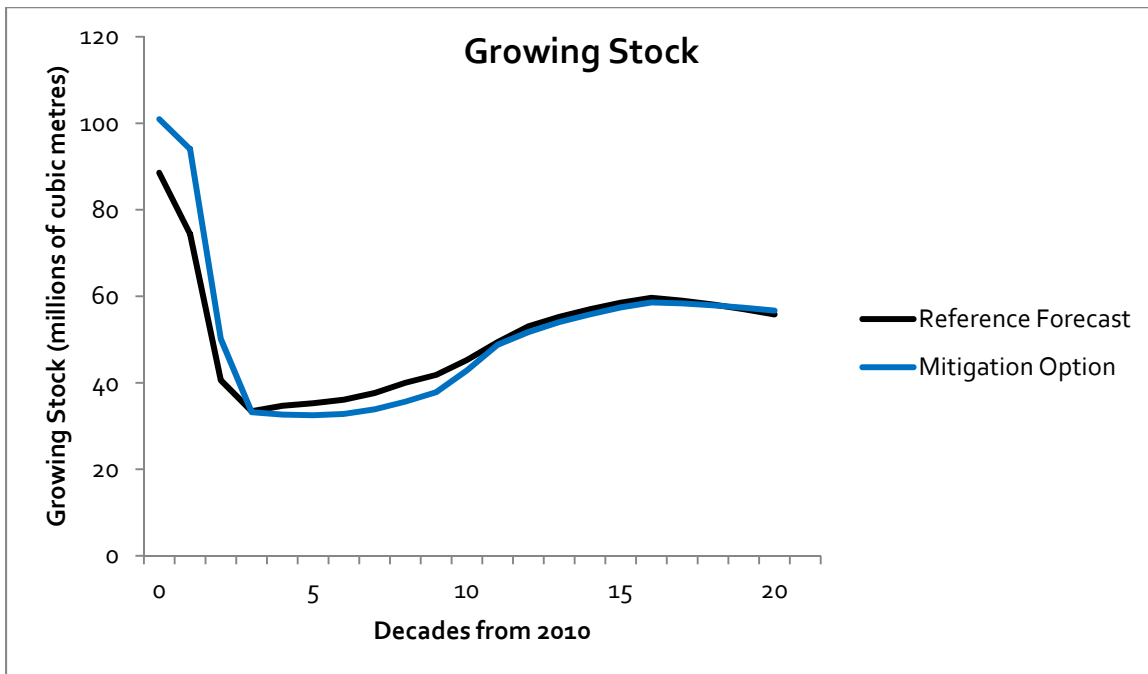


Figure 8 Growing Stock Comparison Between Reference Forecast and Mitigation Option

Forest sector management practices and administration opportunities

In the Lakes TSA, a number of forest sector management practices and administration initiatives have been implemented in the past few years:

- In 2009, as part of a regional initiative, the Nadina District and the major licensees adopted a strategy to mitigate the impact of the MPB on the mid-term timber supply. Key elements of the strategy include:
 - A target that pine is to account for a minimum of 70 percent of the total harvest;
 - A commitment to monitor pine harvest on an annual basis;
 - A commitment to monitor survey results related to secondary structure; and
 - A commitment to pursue opportunities to relax binding constraints;
- Since 2006, 1566 hectares of spruce-leading stands have been fertilized under the Land Base Investment Strategy (LBIS). An additional 4000 hectares per year is anticipated to be fertilized in the next 20 years. This targets 30-40 year-old pine-leading plantations. As shown in Table 4, this could increase the mid-term harvest level by up to 4 percent, or about 20 000 cubic metres per year; and
- A review of licensee and BCTS operating areas is currently ongoing to equitably distribute harvesting opportunities following the issuance of new forest tenures and in the wake of the MPB infestation.

Additional opportunities identified in the category of forest sector changes include reducing the minimum harvestable age, harvesting stands on sites with low productivity (site index 5) and harvesting deciduous-leading stands. However, after review by the Lakes TSA Technical Working Group and based on input from the licensees, these potential opportunities are not deemed worth pursuing at this time due to economic considerations.

The Lakes TSA Technical Working Group also sought input from a group of experts in the fields of ecology, silviculture, hydrology and biology. This group of experts identified an opportunity linked to uneven-age management that would apply to about one-third of the TSA area and which would include OGMAs. This opportunity is described below. The group also identified a need for investment in forestry which would include intensive silviculture, more regular entries in a larger portion of the THLB, and strategic planning for access and management.

SCENARIO/OPTION 4: Manage a portion of an increased timber harvesting land base with uneven-age systems

With this option, OGMAs would be included in the timber harvesting land base. However, OGMAs would require uneven-age management. In total, 30% of the timber harvesting land base would be managed with uneven-age systems. Priority for uneven age management is for OGMAs, connectivity corridors, the Chelaslie Caribou Migration Corridor and scenic areas. Non-pine stands within these areas are suitable to uneven-age management.

<i>Resource Value</i>	<i>Opportunity for mid-term shortfall mitigation</i>	<i>Geographic zone where mitigation opportunity apply</i>	<i>Period for application of mitigation opportunity</i>
OGMAs	Include in the THLB for uneven age management	All	At all times
All	Introduce uneven-age management over 30% of the THLB. Priority for uneven age management is for OGMAs, connectivity corridors, the Chelaslie Caribou Migration Corridor and scenic areas	All (for a total of 30% of the THLB)	At all times

Implications to timber availability:

- Additional volume would be made available in the mid-term as OGMAs would be included in the timber harvesting land base. Although sensitivity analyses were not conducted for this option/scenario, the mid-term harvest levels could be increased by less than 100 000 cubic metres per year.

Implication to non-timber resources/values (i.e., recreation, visual quality, wildlife, old growth, etc.):

- This option could be beneficial to non-timber values if designed specifically for enhancing/restoring these values. For example:
 - In the Chelaslie Caribou Management Corridor, the use of partial cutting (e.g. gaps and small openings < 1ha) targeted at dead pine in higher density stands while maintaining surviving overstory could be applied.
 - In OGMAs and connectivity corridors the use of partial cutting systems that would result in the removal of single tree or the creation of gaps and small openings could enhance the biodiversity value of these areas while providing for timber supply. However, this would require caution and an adaptive management approach would be required to ensure the success of the uneven-age management approach to all timber and non-timber values.
 - Pine-dominated OGMAs lacking and abundance of old growth attributes or recruitment value could be harvested *and* replaced with OGMAs with higher old growth conservation values.
 - Partial cutting, coupled with good visual design management, could also be used in scenic areas, especially in those areas where multiple values overlap.

- Forests are not static, thus reserves established for certain environmental reasons may lose the desired attributes over time. Management intervention can be used to maintain the desired attributes.
- An adaptive management approach would be required to ensure the success of the uneven-age management approach to all timber and non-timber values.

Implications to administrative changes required:

- Amendments to the Lakes South SRMP and Lakes North SRMP would be required under the Land Act to allow intensive management and timber harvesting within OGMAs. This amendment would require consultation with the public and First Nations.
- Amendments to the Lakes South SRMP and Lakes North SRMP under the Land Act may also be required to re-align existing OGMAs with other spatial values (e.g. connectivity corridors) and ensure that OGMAs include effective old growth structure and attributes.
- Current management requirements and policy allow for the replacement of OGMAs through amendments.

Implications to work with external experts:

- Additional work would be required to define the management objectives and details of the uneven-age management system.
- Work would also be required to develop and implement an adaptive management approach.

Summary of stakeholder reactions:

- Still unknown at this point. However, the results of the *Post-Mountain Pine Beetle Recreational Usage Survey* indicate support for partial cutting systems, which are suitable for uneven-age management.

REVIEW OF VISUAL QUALITY OBJECTIVES – LAKES TSA

For many years, a group of forest licensees operating in the Lakes TSA has been requesting that existing visual quality objectives (VQOs) be changed to the next restrictive class (for example, from *partial retention* to *modification*). In 2010, the district manager agreed to review and possibly amend VQOs in selected areas to permit the harvest of large areas of dead pine stands before the economic value is lost.

Seven scenic areas were selected for review by the forest licensees. Within these scenic areas, the licensees believe that *modification* is a desirable and acceptable level of alteration. These licensees also believe a number of benefits would be made possible if VQOs were changed from *retention* or *partial retention* to *modification*: improved timber supply, improved scenic values, reduced fuel loading, and better representation of local public acceptance.

The review process involved collaboration between government and the forest industry to inform the public, local governments and First Nations of the proposed change. The intent of this public outreach was to seek input on appropriate visual retention levels in order to determine whether a government action was desirable and necessary.

Responses received by the public indicate that respondents associated with the forest industry share the belief that changing VQOs would improve timber supply, improve scenic values, reduce fuel loading and better represent local public acceptance. On the contrary, responses received from the tourism sector indicate that existing VQOs should remain unchanged or be changed to decrease the level of harvesting currently acceptable. Just over half of remaining respondents share the belief of respondents associated with the tourism sector.

As broad changes to VQOs are proposed under this mid-term timber supply project, the public input gathered in the Lakes TSA for the selected scenic areas provides specific stakeholder reaction to potential changes to VQOs.

