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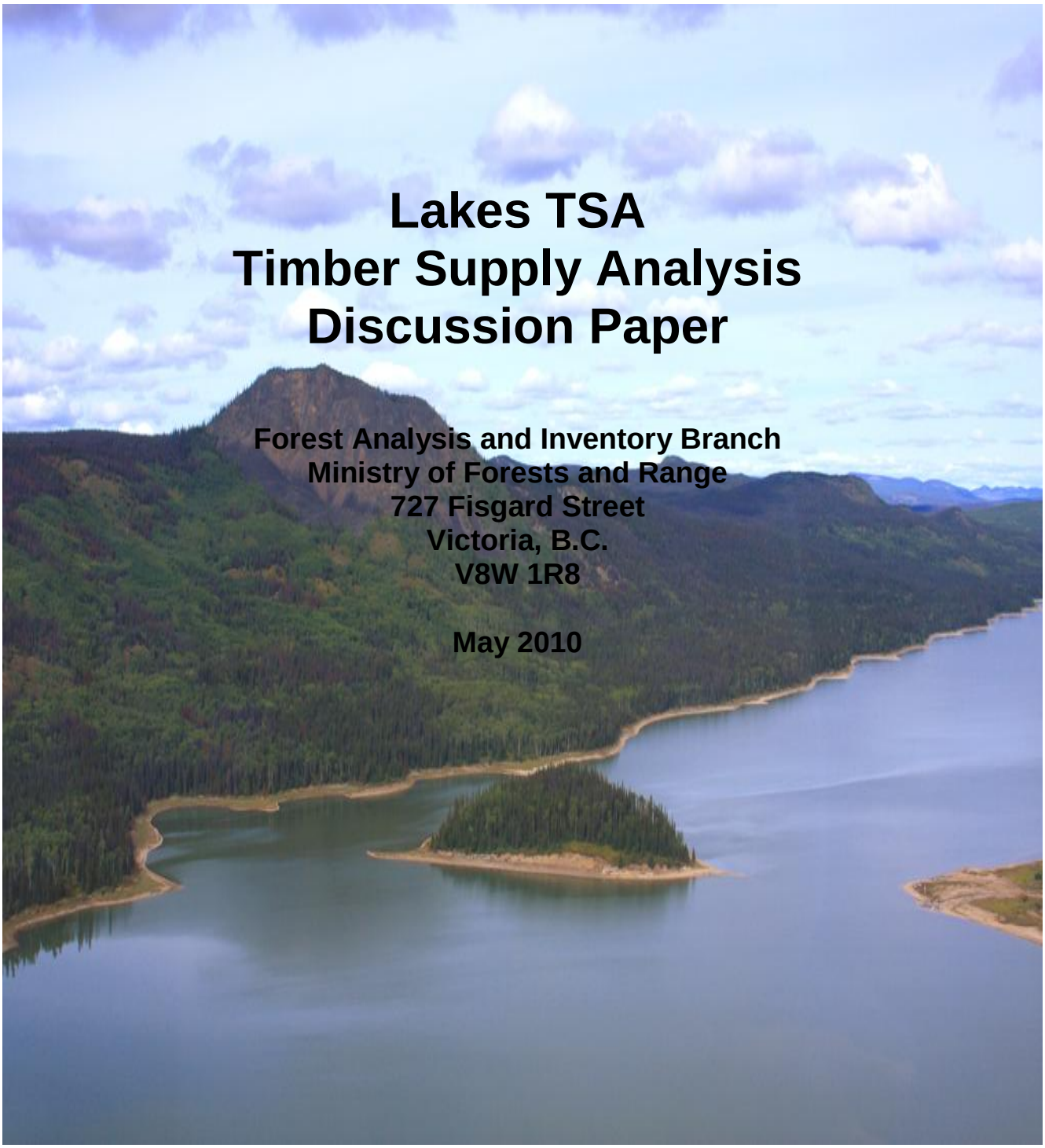

Lakes TSA
Timber Supply Analysis
Discussion Paper

Forest Analysis and Inventory Branch
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Lakes TSA Public Discussion Paper

Introduction

The British Columbia Ministry of Forests and Range regularly reviews the timber supply[a] for all timber supply areas[b] (TSA) and tree farm licences[c] (TFL) in the province. This review, the fourth for the Lakes TSA, examines the impacts of forest management practices on the timber supply, economy, environment and social conditions of the local area and the province. Based on this review the chief forester will determine a new allowable annual cut[d] (AAC) for the Lakes TSA.

According to Section 8 of the *Forest Act* the chief forester must regularly review and set new AACs for all 37 TSAs and 34 TFLs in the Province of British Columbia.

The objectives of the timber supply review are to:

- examine relevant forest management practices, public input, and economic, environmental and social factors;
- set a new AAC; and
- identify information to be improved for future timber supply reviews.

This discussion paper provides a summary of the results of the timber supply analysis for the timber supply review of the Lakes TSA. Details about the information used in the analysis are provided in an April 2009 data package and the technical details of the analysis will be available May 2010 on request from the Ministry of Forests and Range. The timber supply analysis should be viewed as a "work in progress". Prior to the chief forester's AAC determination for the TSA, further analysis may need to be completed and existing analysis reassessed as a result of inputs received during this review process.

Timber supply review in the Lakes TSA

The current AAC for the Lakes TSA, effective October 4, 2004, is 3 162 000 cubic metres. Since the previous timber supply review, improved information has become available regarding the mountain pine beetle (MPB) level of infestation and the extent of beetle-killed pine volume available for salvage harvesting.

This discussion paper provides an overview of the timber supply review process and highlights the results of the timber supply analysis, including harvest forecasts for the Lakes TSA.

Before setting a new AAC, the chief forester will review all relevant information, including the results of the timber supply analysis, and input from government staff, the public and First Nations. Following this review, the chief forester's determination will be outlined in a rationale statement that will be publicly available.

Once the chief forester has determined the new AAC, the Minister of Forests and Range will apportion the AAC to the various licence types and programs. Based on the minister's apportionment, the regional executive director will establish a disposition plan that identifies how the available timber volume is assigned to the existing forest licences and, where possible, to new opportunities.

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[a] **Timber supply**
The amount of timber that is forecast to be available for harvesting over a specified time period, under a particular management regime.

[b] **Timber supply areas (TSAs)**
An integrated resource management unit established in accordance with Section 7 of the Forest Act.

[c] **Tree farm licences (TFLs)**
Provides rights to harvest timber and outlines responsibilities for forest management in a particular area.

[d] **Allowable annual cut (AAC)**
The rate of timber harvest permitted each year from a specified area of land, usually expressed as cubic metres of wood per year.

Lakes TSA Public Discussion Paper

Description of the Lakes Timber Supply Area

The Lakes TSA, located in north-central British Columbia, ranges from Tweedsmuir Provincial Park in the south to Klaytahnkut Lake in the north (see Figure 1). The TSA contains the headwaters of important tributaries of both the Skeena and Fraser watersheds as well as numerous lakes, which include some of the largest fresh water bodies in the province. Forests are mostly lodgepole pine and spruce, with balsam at higher elevations and some small isolated areas of Douglas-fir, particularly along the shores of Babine Lake and François Lake.

The TSA covers approximately 1.5 million hectares of land of which about 72 percent is forest managed by the Ministry of Forests and Range. Of the total TSA area, 26 percent is not available for timber harvesting purposes because it is reserved for parks, biodiversity and riparian management or because the productivity of the site is too low to support tree crops. The forest and range resources of the TSA are administered by the Nadina Forest District office located in Burns Lake.

The Village of Burns Lake, with a population of 2,114, is the largest community within the Lakes TSA. There are also numerous smaller communities in the area including Decker Lake, François Lake, Grassy Plains, and Danskin. Several First Nations reserves and communities are located within the TSA, including: the Cheslatta Carrier First Nation, Burns Lake Band, Nee Tahi Buhn Band, Skin Tyee Band, Wet'suwet'en First Nation and Lake Babine First Nation. In addition to these, the Office of the Wet'suwet'en, Nadleh Whut'en Band, Stellat'en First Nation, Tl'azt'en First Nation, Ulkatcho First Nation and the Yekooche First Nation have asserted rights and titles that overlap the TSA. The total population of the TSA is estimated to be about 6,056.

The economy of the TSA is largely resource-based and mostly dependent on the local forest industry. There are three lumber mills currently operating within the Lakes TSA, along with a finger-joint mill.

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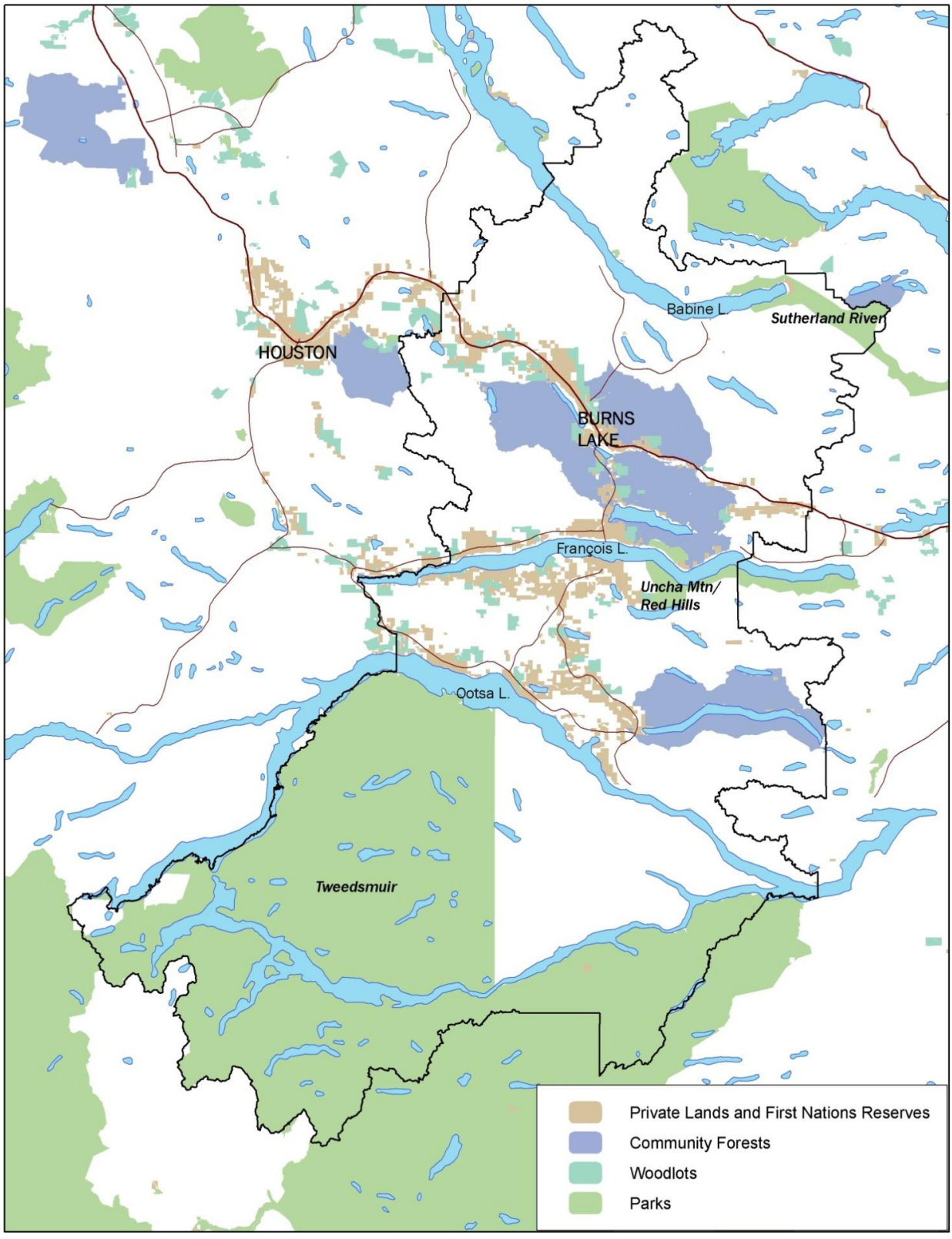

Figure 1. Overview map of the Lakes TSA.

Land use planning

The Lakes District Land and Resource Management Plan (LRMP) was approved by the provincial government in 2000. The plan provides objectives and strategies for various resources, including fish and wildlife, forestry, mining, agriculture, recreation, and tourism. The plan supported the creation of four protected areas – Entiako, Sutherland River, Uncha Mountain/Red Hills and sites along Babine Lake. The plan also supported the creation of resource management zones and objectives for biodiversity, the Chelaslie Migration Corridor and mineral development and wildlife management.

In order to provide better operational direction to implement objectives of the Lakes District LRMP, to manage the mountain pine beetle infestation and to support the increase in allowable annual cut, the Lakes South Sustainable Resource Management Plan (SRMP) was approved by the provincial government in 2003. This plan provides legal objectives for seral stage distribution, old growth management, habitat connectivity, patch size distribution and wildlife tree retention.

In 2009, the Lakes North SRMP was approved by the provincial government. This plan is consistent with and also builds on the provisions of the Lakes LRMP and includes objectives for the management of biodiversity values in forested ecosystems.

In addition to these government-approved higher level plans, the forest licensees that are part of the Morice and Lakes Innovative Forest Practices Agreement (IFPA) have developed a sustainable forest management plan for the Lakes TSA. This plan proposes an adaptive management framework and identifies key indicators to measure progress in achieving a sustainable balance of social, economic and ecological values over time.

First Nations

Eleven First Nations and one hereditary entity have asserted traditional territories within the Lakes TSA. These First Nations include: Burns Lake Band, Cheslatta Carrier First Nation, Nee Tahi Buhn Band, Skin Tyee Nation, Wet'suwet'en First Nation, Lake Babine First Nation, Stellat'en First Nation, Nadleh Whut'en Band, Yekooche First Nation, Tl'azt'en First Nation, Ulkatcho Band and the Office of the Wet'suwet'en (hereditary). Of the eleven, the Burns Lake Band, Cheslatta Carrier First Nation, Nee Tahi Buhn Band, Skin Tyee First Nation, Lake Babine First Nation, and the Wet'suwet'en First Nation all maintain permanent communities within the Lakes TSA.

Most First Nations in the TSA have held, currently hold, or have been offered non-replaceable forest licences. The volume available under these licences has recently been related to beetle control, salvage, or linked to forestry revitalization initiatives. Additionally, the Cheslatta Carrier First Nation holds both a community forest tenure and a key partnership interest within a stud mill on Ootsa Lake (Cheslatta Forest Products Ltd.). The Nee Tahi Buhn Band holds a woodlot south of Francois Lake.

First Nations have expressed concerns about the cumulative impact to forest resources resulting from the mountain pine beetle infestation and the control/salvage harvesting activity of the last several years.

Natural resources and environmental values

The forested landscape of the Lakes TSA contains numerous natural resources and related values. In addition to forest products, these include wildlife and fish habitat, ranching, and recreation and tourism.

A number of wildlife species identified as requiring special management to address the impacts of forest activities occur in the Lakes TSA. These include populations of northern caribou in the south and mountain caribou in the north, as well as grizzly bear. Mountain goat, large populations of moose and mule deer, pine marten, fox, and lynx are also found throughout the TSA. Fish species include: sockeye, rainbow trout, lake trout and burbot.

In addition to fish and wildlife habitat, the forested landscape of the TSA supports an active ranching industry and provides guiding and trapping opportunities. Local residents and visitors alike enjoy the varied fishing and hunting experiences afforded by the natural resources of the Lakes TSA as well as recreational activities such as camping, hiking, cross-country skiing, snowmobiling, mountain biking and foraging.

All forested lands, whether they contribute to timber supply or not, provide critical values. Therefore, the timber supply analysis includes forest cover requirements for biodiversity, visual quality, riparian management and protection of wildlife habitat.

Current forest management must be consistent with the requirements of the *Forest and Range Practices Act* (FRPA) and associated regulations, which are designed to maintain a variety of forest and range values. In the Lakes TSA approximately 26 percent of the productive forest land is excluded from harvesting because it occurs in a park, reserve, or in an old growth management area. These areas are still assumed to provide for some non-timber values.

Mountain pine beetle epidemic

Mountain pine beetle is native to British Columbia and usually occurs at endemic levels. Epidemic outbreaks have occurred periodically throughout the province and have played a vital role in the natural disturbance of pine forests, contributing to biodiversity and variation across the landscape.

Prior to the current epidemic, the largest outbreak in recorded history occurred between 1930 and 1936 on the Chilcotin Plateau. At its peak, that infestation affected 650 000 hectares; whereas, the area infested in the current epidemic is about 16.3 million hectares. Between 1998 and the summer of 2009 it is estimated that mountain pine beetle killed approximately 675 million cubic metres of pine (green-, red- and grey-attack) or about 50 percent of the commercially available pine volume in British Columbia.

The magnitude of the current outbreak has been attributed to two factors. First, due to the success of fire suppression over the past century, the area of mature lodgepole pine – the beetle's preferred host – has increased sixfold. The second factor is climate change. Historically, beetle populations have been limited by cold winters; however, the absence of sufficiently cold temperatures in the interior has allowed large populations of beetles to survive the winters under the bark of the pine trees.

It is currently projected that about 70 percent of the pine on the timber harvesting land base across the interior of British Columbia will be killed by 2015. In the Lakes TSA it appears that the infestation peaked in the summer of 2004. By 2009, approximately 90 percent of the pine trees available for harvesting in the Lakes TSA had been killed by the mountain pine beetle. This figure is not expected to change significantly in the future. Very little new attack is projected over the next 10 years. By 2019, almost all of the beetle-killed pine stands will have been dead for more than 15 years.

These current and future projected impacts of the mountain pine beetle epidemic were included in all the forecasts presented in this paper. The major assumptions common to all the timber supply scenarios presented in this discussion paper are summarized in Appendix 1.

As discussed in Appendix 1, shelf-life is defined as the length of time a tree is assumed to remain standing after attack by the mountain pine beetle. For this timber supply review, no assumptions are made about the potential end use of the dead pine (i.e., whether or not the fibre is of sufficient quality for use as sawlog, pulp or for bioenergy). All scenarios presented in this analysis assume that beetle-killed trees will remain standing and useable for 15 years, after which time they fall over and become unusable for timber, pulp or bioenergy.

Ministry and licensee response to the beetle infestation

There has been a sustained effort by government and forest licensees within the Lakes TSA to salvage mountain pine beetle infested stands. Lodgepole pine comprises about 64 percent of the total volume of mature volume on the timber harvesting land base. Since 2004, an average of 78 percent of the volume harvested annually in the TSA has been lodgepole pine.

This has been accomplished through the following beetle management strategy:

- focussing new non-replaceable forest licence awards to mountain pine beetle damaged timber;
- regular monitoring of individual licensee harvesting in order to ensure total harvesting exceeds 75 percent pine by volume;
- developing a comprehensive mid-term timber supply strategy that directs as much harvest as possible to pine stands, and retains stands with suitable secondary structure; and
- amending the previous regulatory regime to allow faster administration and harvest of beetle infested stands and, where appropriate, protecting the understory of dead pine stands to minimize the decrease in the mid-term timber supply.

Recent history of the allowable annual cut

In 1982, 1987, and again in 1996, the chief forester reviewed timber supply and set the AAC for the Lakes TSA at 1 500 000 cubic metres.

In August 2001, in response to the mountain pine beetle epidemic, the chief forester increased the AAC for the Lakes TSA to 2 962 000 cubic metres. This represented an increase of about 97 percent over the previous AAC. This increase was intended to facilitate the salvage of timber damaged by mountain pine beetle and attempt to diminish the extent of further damage.

Effective October 1, 2004, the AAC was further raised to 3 162 000 cubic metres or seven percent above the previous level. The purpose of this increase in AAC was to salvage timber killed by the MPB epidemic. The chief forester noted that this AAC, which is still in effect today, was to be targeted towards pine stands affected by the mountain pine beetle. The table below shows the harvest performance since 2004.

Table 1. Harvest performance since 2004.

Year	AAC	Total harvested	Other	Pine lead	Percent harvest pine-leading
2004	3,160,000	1,637,165	54,926	1,582,239	96.6%
2005	3,160,000	1,765,756	738	1,765,018	100.0%
2006	3,160,000	2,233,421	2,802	2,230,619	99.9%
2007	3,160,000	1,437,527	-450	1,437,977	100.0%
2008	3,160,000	1,328,505	6,279	1,322,226	99.5%
Average	3,160,000	1,680,475	12,859	1,667,616	99.2%

Timber supply forecast scenarios

The purpose of the current timber supply review is to provide the chief forester with information to consider in determining a new AAC for the Lakes TSA. Pine-leading stands, both pure and mixed with other species, represent about 74 percent of the area within the timber harvesting land base. Ministry staff estimate that by 2009, approximately 90 percent of the pine volume had been killed by the mountain pine beetle epidemic. One of the key issues in this determination, and potentially subsequent ones, is how to manage the flow of timber from the remaining mature, non-pine forests that were unaffected by the MPB infestation until currently immature stands are suitable for harvesting.

In previous timber supply analyses one harvest forecast is presented as an outcome of the best available data and current management practices. This forecast is referred to as the 'base case'. However, the extent of the damage caused by the mountain pine beetle epidemic has increased the uncertainty regarding the effect of forest management practices on timber supply. Therefore, no single timber supply forecast is being presented as the base case. Instead, using a common data set, three timber supply scenarios, which are based on different management assumptions, were prepared to explore the implications of a range of forest management choices. An assessment of the harvest forecasts from these scenarios should serve to stimulate discussion and guide future management practices. The scenarios are as follows:

1. Continue the salvage harvest of dead pine stands at the level of the current AAC until all the salvageable pine has been harvested. Also, harvest the non-pine leading stands at the highest sustainable rate.
2. Harvest pine-leading stands at the average actual harvest level for the past five years then mitigate the projected decline in timber supply by harvesting non-pine leading stands above the sustainable rate for one decade, until the regenerating pine stands begin to be available for harvest.
3. Salvage pure pine stands (70 percent pine) for the first decade. Then harvest pine-leading stands (up to 70 percent pine), non-pine leading stands and regenerating stands to obtain the highest harvest levels for the remainder of the forecast.

These scenarios were prepared using a computer model that projects the future availability of timber for harvesting based on the growth of the forest and level of harvesting, while staying within the legal objectives established by the provincial government under higher level plans (see *land use planning*). The major forest management assumptions common to all the scenarios presented are discussed in Appendix 1.

The impact of the mountain pine beetle was modelled in all the forecasts presented in this paper. For this timber supply review, shelf-life is defined as the length of time a tree is assumed to remain standing after attack by the mountain pine beetle. As discussed in Appendix 1, all scenarios presented in this analysis assume that beetle-killed trees will remain standing for 15 years, after which time they fall over and become unusable. No assumption is made about the potential end use of the dead pine (i.e., whether or not the fibre is of sufficient quality for use as sawlog, pulp or bioenergy products).

Scenario 1: Maintain the current harvest focus on pine salvage until all stands have been salvaged or have fallen down, then allow the harvest to decline to the highest sustainable level of non-pine stands until regenerating pine stands become available.

In scenario 1, the initial harvest level for pine-leading stands is set at 3.16 million cubic metres per year, which is the current AAC for the Lakes TSA. In addition, non-pine leading stands are harvested at a rate of 250 000 cubic metres per year, which is the highest sustainable harvest level from this stand type. As shown in Figure 2, the combined harvest level of 3.41 million cubic metres per year can be maintained for 10 years. After the first decade, the pine-leading stands have either been salvaged or have fallen over and are no longer merchantable and the harvest level drops to 250 000 cubic metres per year – the sustainable level of non-pine – for one decade. At the beginning of the third decade, regenerating pine-leading stands become available for harvesting and this increases the projected harvest level to 450 000 cubic metres per year. Over time, the contribution from regenerating pine-leading stands continues to increase so that by the eighth decade a long-term harvest level of 1.15 million cubic metres per year is achieved.

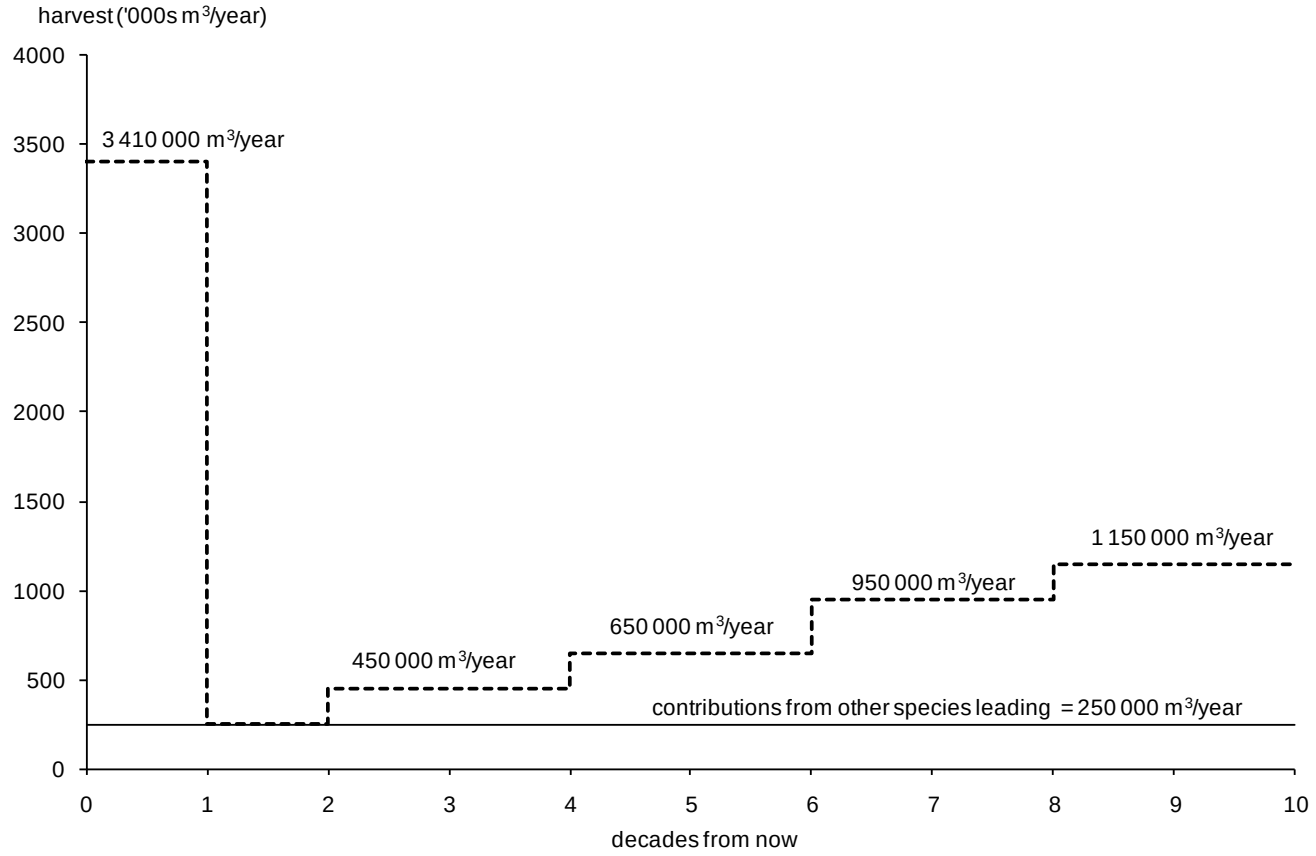

Figure 2. Scenario 1 — projected harvest if pine-leading stands continue to be salvaged at the current AAC and non-pine leading stands are harvested at the maximum sustainable level. Year 0 is 2009.

Further analysis showed that it may be possible to salvage slightly more pine by increasing the harvest of pine-leading stands from 3.16 million to 3.40 million cubic metres per year. These high harvest levels are possible only if harvest starts with the stands that have been dead the longest and proceeds to the most recently killed stands. If harvesting starts with the more recently killed stands or proceeds in a random manner, then many of the stands killed before 2004 will not be harvested before their assumed shelf-life expires. In practice, it will be impossible for harvesting to proceed with the oldest dead stands first. Taking this into account, and assuming a 15-year shelf-life for stands, suggests that it is very unlikely that pine-leading stands could support a harvest level greater than about 2.5 million cubic metres per year in this TSA. If dead pine trees remain standing for longer than 15 years then there will be some opportunity for harvesting pine beyond the end of the first decade (2019).

Scenario 2: Limit the harvest to pine-leading stands only at the current harvest level until the stands fall down, then mitigate the projected decrease in mid-term harvest levels by harvesting at a higher level from non-pine leading stands.

Since 2004, licensees have not harvested the full AAC and in 2008 the actual harvest was less than 1.3 million cubic metres. During the past five years the average harvest was 1.6 million cubic metres per year with very little harvest coming from non-pine leading stands. In this scenario, it is assumed that licensees are able to continue their focus on pine-leading stands and reserve the non-pine for later harvest.

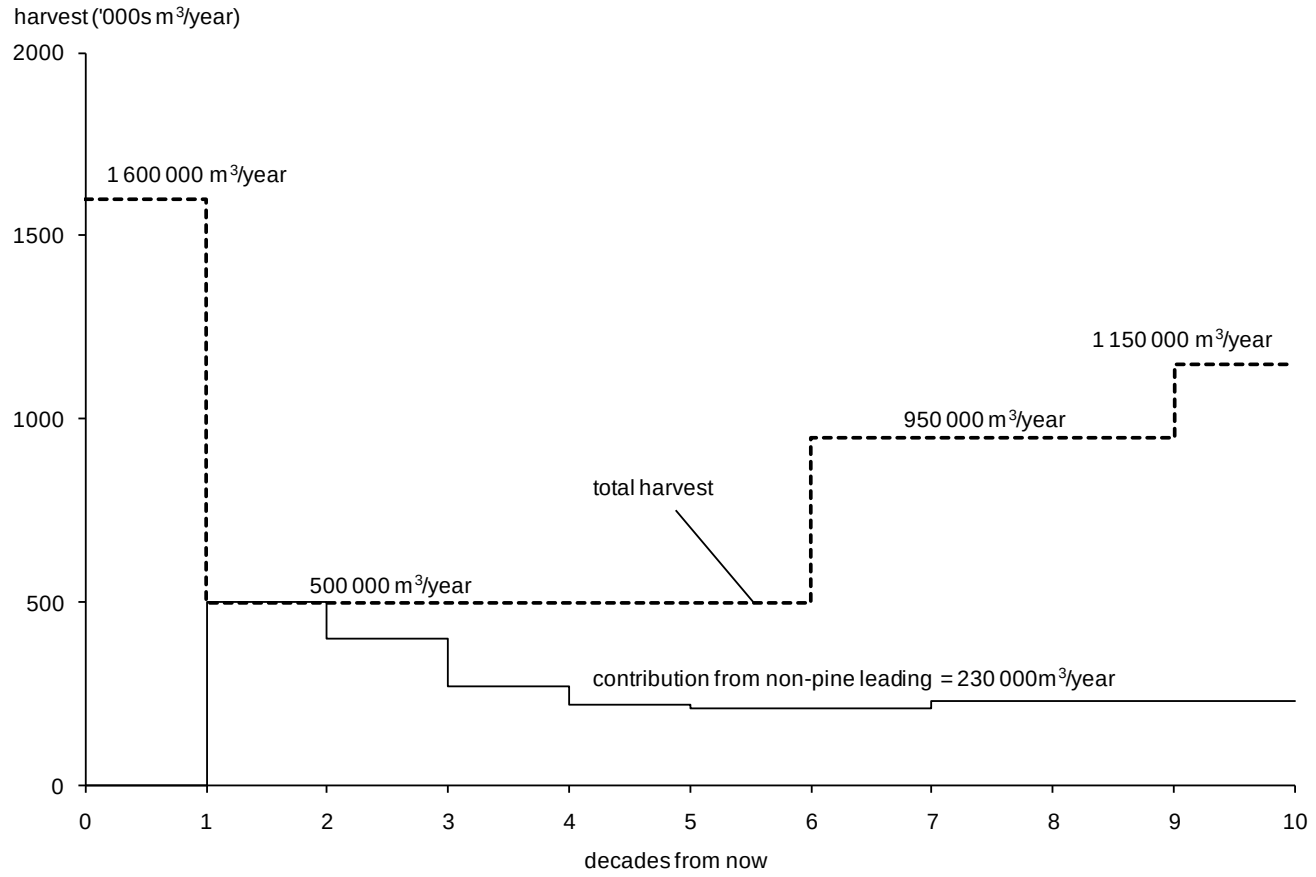

Figure 3. Scenario 2 — Impact of no harvest from non-pine leading stands for the next 10 years. Year zero is 2009.

Figure 3 shows a harvest forecast where pine-leading stands contribute 1.6 million cubic metres per year for the first 10 years and no harvest is allowed from non-pine leading stands. After 10 years, non-pine leading stands are harvested at a rate of 500 000 cubic metres per year for one decade, twice the level allowed in scenario 1. The same total harvest level is maintained for the next 40 years, with a steadily increasing contribution from regenerating pine stands as they become eligible for harvesting. After 60 years, the harvest level increases to 950 000 cubic metres per year, and by the ninth decade the long-term harvest level of 1.15 million cubic metres per year is reached. In this scenario, regenerating pine stands do not contribute as much to the harvest as in scenario 1 because overall, fewer beetle-killed pine stands are harvested and converted to managed stands. Unharvested pine-leading stands are assumed to regenerate naturally and take longer to become harvestable again.

As seen in Figure 3, there are no existing pine-leading stands available for harvesting after the first decade even though fewer pine-leading stands are salvaged in scenario 2 than in scenario 1. This is because 90 percent of the pine has already been killed at the start of the harvest forecast, and any pine not harvested in the first decade will have been dead for more than 15 years – the assumed shelf-life.

Scenario 3: Harvest stands with greater than 70 percent pine (pure pine) for the first 10 years then harvest a combination of stands with less than 70 percent pine and regenerating stands to obtain the highest mid- to long-term harvest levels.

During the past five years almost the entire harvest from the Lakes TSA was from pine-leading stands and most of those stands contained more than 70 percent pine. In scenarios 1 and 2, it was assumed that if a stand contained less than 140 cubic metres per hectare it was uneconomical to harvest. Thus, it was possible that some pine-leading stands – where the non-pine volume was less than 140 cubic metres per hectare – were not harvestable after the pine content had been dead for more than 15 years. In scenario 3, the harvesting was

focussed on pure pine stands in the first decade. From decades 2 to 6, pine-leading stands with less than 70 percent pine contributed 230 000 cubic metres per year to the harvest forecast. In this scenario, the minimum harvestable volume criterion was lowered to 100 cubic metres per hectare to allow these otherwise unharvestable stands to be harvested in the mid-term. This contribution, together with harvest from non-pine leading stands and regenerating, managed stands enabled the mid-term harvest level to be as high as 750 000 cubic metres per year. Figure 4 shows the harvest forecast resulting from this course of action.

In this scenario it was possible to harvest pure pine stands at 2 100 000 cubic metres per year for 10 years before harvest levels decreased to a mid-term harvest level of 750 000 cubic metres per year. After the first six decades the harvest level increases to 810 000 cubic metres per year for 30 years, at which time a long-term harvest level of 1 115 000 cubic metres per year is attained. In the very long term the harvest level from the non-pine stands recovers to 250 000 cubic metres per year, as in scenario 1.

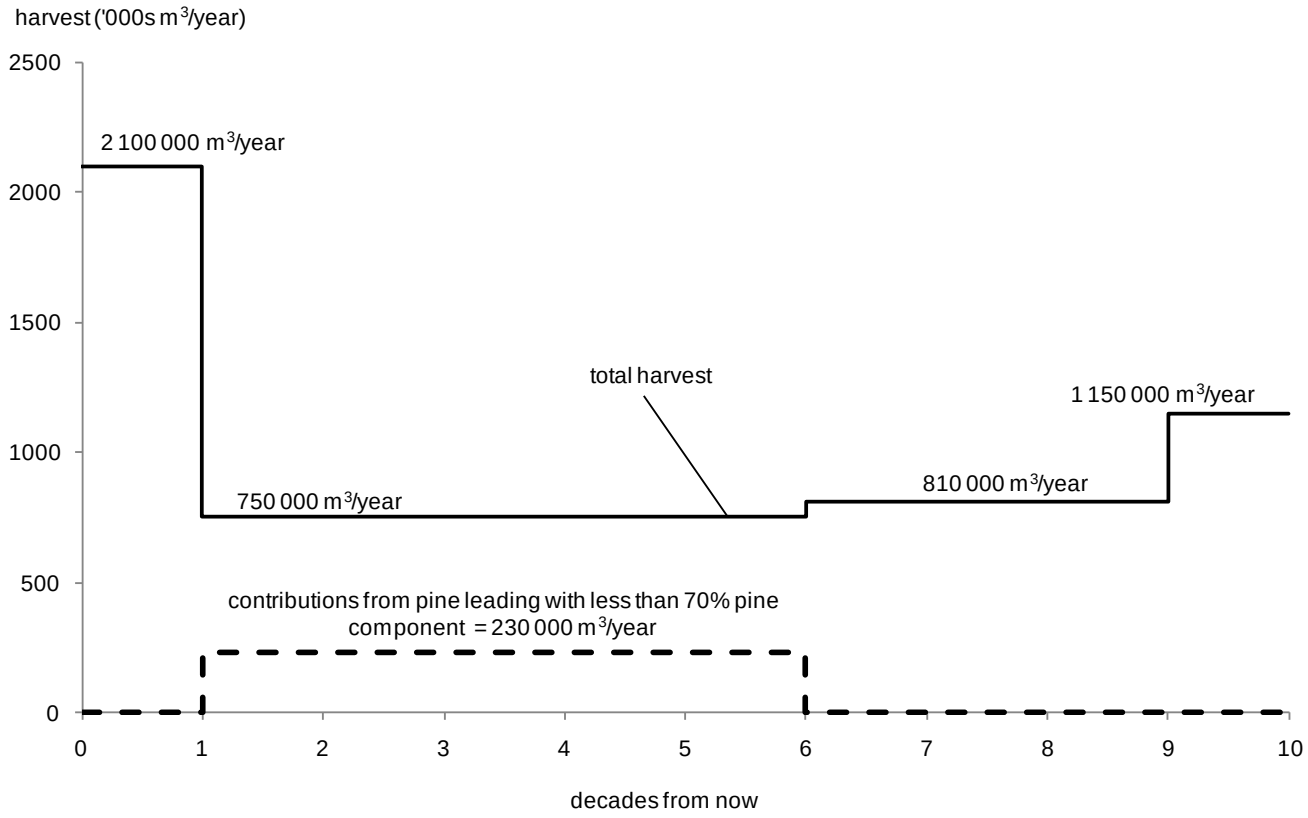

Figure 4. *Scenario 3 — Harvest pure pine stands for the first 10 years. Note year zero is 2009.*

Summary

In this analysis, no single base case was modelled that showed a timber supply forecast resulting from current forest management practices. Because of the depletion in growing stock caused by the MPB infestation, choices made about managing both the pine and non-pine timber resources could dramatically affect timber supply. The scenarios presented in this public discussion paper were intended to span a range of possible management choices and stimulate discussion about future forest practices. Current forest management practices are probably best approximated by scenario 2 which assumes there will be no harvesting in non-pine leading stands for the next decade. The following conclusions could be made about the scenarios presented:

1. Maintaining an elevated initial harvest level of about three million cubic metres per year for 10 years is only possible if licensees harvest the oldest dead pine-leading stands first, before harvesting the more recently killed stands. After 10 years the pine will either have been harvested or be past its shelf-life, and the harvest must move into the non-pine leading stands.
2. If harvest is restricted exclusively to the pine-leading stands for 10 years at the current harvest level before moving into non-pine stands it is possible to have a harvest level of about 500 000 cubic metres per year that can be maintained for several decades.
3. If the salvage was focused on pure pine stands for the first decade and the minimum harvestable volume criterion adjusted to allow the harvest of pine-leading stands with less than 70 percent pine then the mid-term harvest level could be 750 000 cubic metres per year.

None of the scenarios presented explored the timber supply implications of altering stand tending practices or assumptions regarding the minimum economically harvestable volumes. If licensees could economically harvest lower volume stands, a higher mid-term harvest level would be expected than the levels portrayed in this report.

The provincial chief forester's AAC determination is a judgement based on his professional experience and his consideration of a wide range of information as required under Section 8 of the *Forest Act*. An AAC is neither the result of a calculation nor limited to the results of timber supply analysis; therefore, the new AAC may not be the same as any of the initial harvest levels depicted in any of the scenarios included in this document.

Implications of changes in the AAC

Environmental implications

The current mountain pine beetle infestation in the Lakes TSA will inevitably affect forest values such as wildlife habitat, stream hydrology and visual quality. While some wildlife will lose habitat, dead trees will provide habitat for other species of wildlife. New forests will also provide habitat for those species that utilize young forests.

Trees affect stream flow mainly through evapo-transpiration, shading and interception of precipitation. Beetle-killed trees no longer transpire and are less effective in providing shade. Therefore, it is important to consider hydrological impacts during salvage harvesting in watersheds impacted by the beetle epidemic.

The district will monitor the beetle epidemic, effectiveness of management strategies, and licensee responsiveness to the epidemic, and report the findings periodically to the chief forester.

First Nations implications

At the time of writing, most First Nations asserting territory in the Lakes TSA have held, currently hold, or have been offered non-replaceable forest licences. The Cheslatta Carrier First Nation holds a community forest agreement.

The Ministry of Forests and Range will continue consultation efforts with respect to this timber supply review and intends to continue to fulfil its legal obligations to consult with First Nations in conjunction with the release of this public discussion paper.

Community implications

The implication of changes in the allowable annual cut for local communities is an important consideration in the timber supply review. The Lakes TSA is one of two TSAs in the Nadina Forest District for which the forest sector provides 46 percent of the basic employment. In the Village of Burns Lake, the largest community in the Lakes TSA, the forest sector provides 37 percent of the after tax income.

The forest sector in the Nadina Forest District, which includes the Lakes and the Morice TSAs, supported a labour force of 2,035 in 2001. By 2006, this had declined by eight percent, to 1,880. The sector supports additional employment through businesses purchasing goods and services (indirect impact) and through employees spending their income on local goods and services (induced impact). For the 1,880 direct jobs in the Nadina Forest District (BC Stats 2006), over 1,600 additional jobs are supported through indirect and induced spending.

The mountain pine beetle epidemic led to increases in forestry activity initially after the 2001 determination, although the harvested volume has never reached the level of the AAC since 2001. The harvest levels peaked in 2006 at 2.234 million cubic metres, or about 70 percent of the AAC. The harvest levels have declined since that time in response to the economic recession. The average volume harvested between 2005 and 2009 was 1.586 million cubic metres or about 51 percent of the AAC.

Since 2008, processing activity in the Lakes TSA has been subject to various temporary mill closures. In 2008 the three mills in the TSA operated at 52 percent of their milling capacity.

The three scenarios, which are based on different management assumptions, presented in this discussion paper forecast that timber supply will decrease significantly 10 years from now to a lower mid-term level. In all three scenarios, the mid-term timber supply does not begin to recover for 50 years. The mid-term harvest levels projected for scenarios 1, 2 and 3 are 250 000 cubic metres per year, 500 000 cubic metres per year and 750 000 cubic metres per year, respectively.

The table below provides an assessment of the employment related implications of these three timber supply scenarios. The significant decline in the timber supply is accompanied by a steep decline in employment. Over the past five years, about 58 percent of the volume of timber harvested was processed outside of the TSA, and thus the figures in the table reflect both declines in the Burns Lake area and in other adjacent TSAs.

Table 2. Lakes Timber Supply Area, employment impacts, in person-years.

Forestry sub–sector	Pre-2001 AAC	Current AAC	Average harvest 2005-09	Scenario 3 decade 1	Scenario 3 decade 2-6	Scenario 2 decade 1	Scenario 2 decade 2+	Scenario 1 decade 2
Timber supply volume (cubic metres)	1,500,000	3,162,000	1,353,627	2,100,000	750,000	1,600,000	500,000	250,000
Employment (person-years)								
Harvesting and silviculture	399	841	360	559	200	426	133	67
Processing	392	825	353	548	196	418	131	65
Direct employment supported by the Lakes TSA	791	1,666	713	1,107	395	843	264	132
Indirect and induced impacts	256	540	231	359	128	273	85	43
Total direct, indirect and induced impacts	1,047	2,207	945	1,466	523	1,117	349	174

The table indicates that the processing sector in the Lakes TSA is capable of consuming well over one million cubic metres of logs per year. Assuming that the total volume available for harvest is of sawlog quality and remains in the TSA for processing, the available volume in the second decade would support one medium-sized sawmill with a capacity to produce about 150 million board feet per year. A mill of this size would produce about 60 thousand bone dry units of chips per year.

Your input is needed

Public input is an important part of establishing the allowable annual cut. Feedback is welcomed on any aspect of this discussion paper or any other issues related to the timber supply review for the Lakes TSA. Ministry of Forests and Range staff would be pleased to answer questions to help you prepare your response. Please send your comments to the Nadina Forest District Manager at the address below.

Your comments will be accepted until July 23, 2010.

You may identify yourself on the response if you wish. If you do, you are reminded that responses will be subject to the *Freedom of Information and Protection of Privacy Act* and may be made public. If the responses are made public, personal identifiers will be removed before the responses are released.

For more information contact and/or mail your comments to:

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Further information regarding the technical details of the timber supply analysis are available on request by contacting Forests.ForestAnalysisBranchOffice@gov.bc.ca

For more information, visit the Forest Analysis and Inventory Branch web site at http://www.for.gov.bc.ca/hts

Appendix 1: Major assumptions

Assumptions common to most of the scenarios presented in this discussion paper are outlined in the sections that follow. For more detail and for information regarding other modelling assumptions please refer to the Lakes TSA technical report available May 2010 on request from the Ministry of Forests and Range. The assumptions used represent the best available information regarding observed forest management.

Projection of the beetle epidemic

Except where stated, the scenarios presented in this public discussion paper assume the mountain pine beetle epidemic has peaked in the Lakes TSA.

For this analysis, the progression of the epidemic in the Lakes TSA was projected using the computer model BCMPB (v.5) developed by scientists in the Ministry of Forests and Range, the Canadian Forest Service and consultants. The computer model was calibrated using provincial infestation maps from 1999 to 2007.

However, BCMPB.v5 only projects the progression of the epidemic in stands 60 years old or greater. From spring 2006 to September 2008 additional data was collected by a combination of ground and aerial surveys regarding the extent of mortality in pine stands less than 60 years old. The observed young stand mortality to date was included in the timber supply projections presented in this discussion paper.

Best estimates indicate that by 2009, all of the timber harvesting land base across the entire Lakes TSA had been impacted by mountain pine beetle.

Shelf-life

A major assumption impacting the effectiveness of any salvage program is the shelf-life of the dead lodgepole pine, or the length of time it will remain commercially viable. After that period the dead pine is considered a non-recovered loss (NRL).

There is great uncertainty regarding shelf-life. It is dependent on several factors, including market conditions, the price of the timber and available milling technology. In this analysis, it was assumed that the dead trees will have some commercial use (e.g., sawlogs, chips, bioenergy) as long as the trees are standing. Once the trees fall to the ground it was assumed the stems would quickly rot. It was assumed the trees would remain standing for 15 years after infestation by mountain pine beetle. These assumptions are different than previous assumptions about shelf-life.

The graphs presented in this discussion paper show the contribution to the harvest forecast of volume from trees dead for two grouped periods of time. Presenting the information in this way makes it possible to solicit people's opinions and knowledge regarding shelf-life for various commercial products in the future and accordingly interpret the timber supply projections without the requirement to rerun the timber supply model.

Management for non-timber values

All forest cover constraints required to manage for visual quality, wildlife habitat, old growth as well as any area-specific management objectives were modelled in this analysis. These constraints are listed in the Lakes TSA data package dated April 2009.