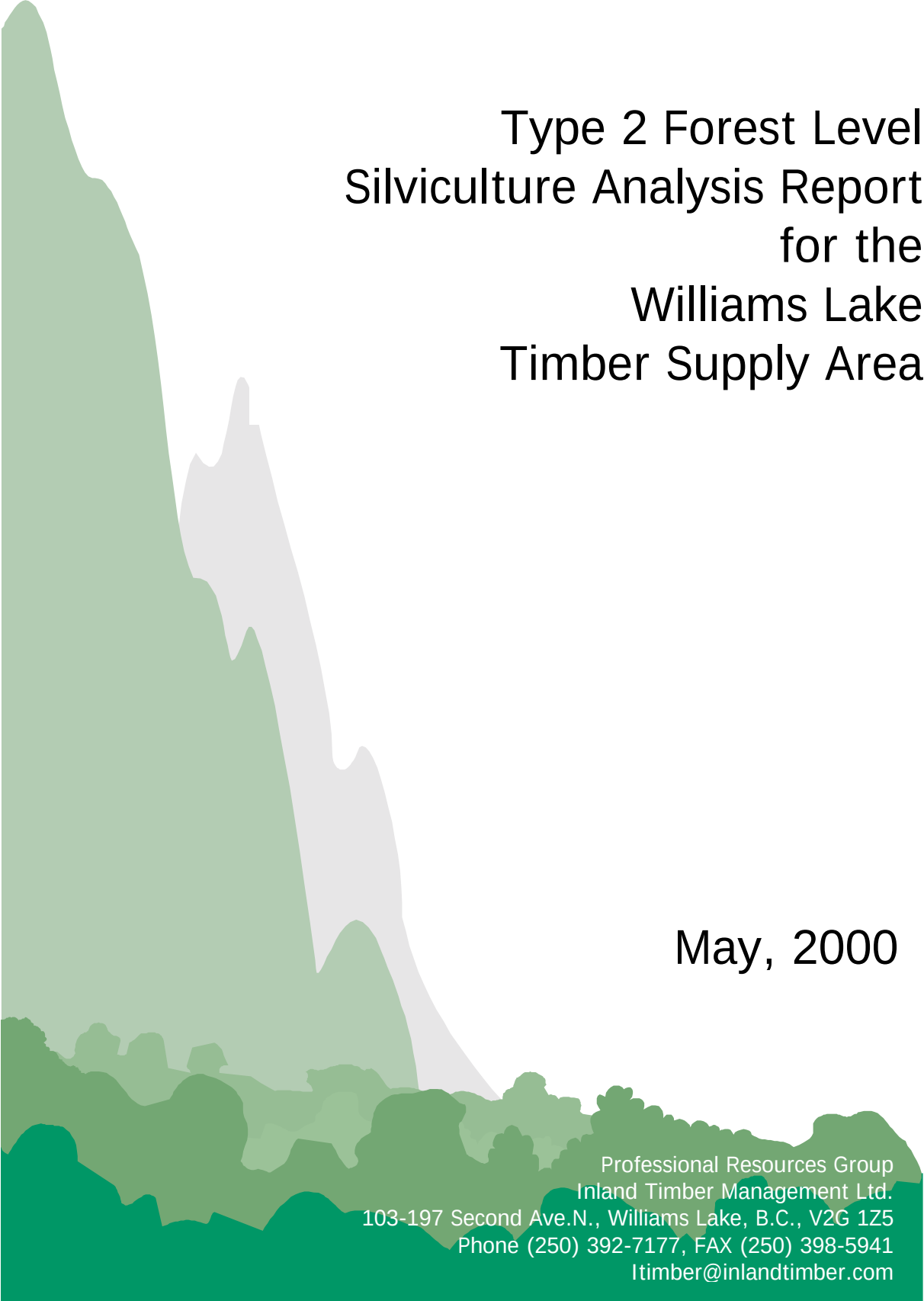


A stylized background illustration of a mountain range. The mountains are depicted in various shades of green, with a prominent light green mountain on the left and a series of smaller, darker green mountains along the base. A white, jagged mountain peak is visible in the background, partially obscured by the green mountains.

# Type 2 Forest Level Silviculture Analysis Report for the Williams Lake Timber Supply Area

May, 2000

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## EXECUTIVE SUMMARY

### BACKGROUND

Type 2 Forest Level Analysis was conducted to assess the impact of implementing various incremental silviculture scenarios, including two land base classification issues, on timber supply in the Williams Lake Timber Supply Area. Administered by the Ministry of Forests (MOF), the analysis was performed by Inland Timber Management Ltd. Forest Renewal BC provided project funding.

The objective is to identify, at a strategic level, options which may be implemented to enhance timber productivity in the Williams Lake TSA. In addition to the “base case”, scenario analysis includes the evaluation of Old Growth Site Index adjustments (OGSI), Site Index Biogeoclimatic Ecological Classification adjustments (SIBEC) and several silvicultural scenarios in terms of their impact on timber supply. Analysis is provided for the “Main TSA” as well as the combined “Three Western Supply Blocks” (Chilcotin, Tatla and Anahim Supply Blocks) in order to maintain consistency with the Timber Supply Review (TSR) process.

Land use assumptions and management strategies, as defined in the *Williams Lake TSA TSR II Information Report and Data Package (August 1999)*, were used to model the “base case<sup>1</sup>”. An additional reduction to mature species volumes was incorporated to reflect the results of the MOF’s 1998 mature inventory audit since it is likely the Timber Supply Branch will embody the audit results in the *TSR II Analysis Report*. Silviculture modelling criteria were developed in co-operation with several local working groups<sup>2</sup> and drew on a range of local knowledge as well as the results of past and present timber supply reviews and existing silvicultural analysis.

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<sup>1</sup> The role of the “base case” in timber supply evaluations is essentially to reflect the status of current management techniques and assumptions on the available timber supply over time.

<sup>2</sup> primarily the Timber Investment Strategy Committee and the Williams Lake TSA Options Working Group

A significant issue highlighted in the TSR I analysis was the existence of a short term fall down - largely a result of the high percentage of the TSA falling into the lower age classes. The “base case” used in this analysis reflects a redefinition of the Timber Harvesting Land Base (THLB) which provides an additional 745,540 ha available for harvest. This has resulted in a substantial improvement in the current age class distribution thus eliminating the short term fall down which was projected in TSR I. The “base case” analysis results in a projected even flow harvest rate of 2,419,000 m<sup>3</sup>/year following the first decade<sup>3</sup> for the Main TSA. This is an increase of 12.7 % or 308,000 m<sup>3</sup>/year in the long term sustainable harvest level from the Chief Forester’s TSR I determination. The base case results in the Western Supply Blocks indicate a harvest level of 658,600 m<sup>3</sup>/year for the first decade with a reduction to 550,400 m<sup>3</sup> for the remaining 25 decades. Therefore, the sustainable harvest flow could potentially be increased by 34% from the TSR 1 determination.

## RESULTS

### **Main TSA (excludes Chilcotin, Tatla and Anahim Supply Blocks)**

Two scenarios offering the potential to significantly impact harvest flow are inclusion of OGSi and SIBEC adjustments.

- 1) When the OGSi adjustments were added to the base case assumptions the result was a long term harvest of 2,740,000 m<sup>3</sup>/year - an increase of 13.27 % or 321,000 m<sup>3</sup>/year after the first decade.
- 2) The addition of the SIBEC adjustments has had an even more dramatic effect, increasing the sustainable harvest flow to 3,060,800 m<sup>3</sup>/year - an increase of 26.49% or 641,000 m<sup>3</sup>/year after the first decade.

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<sup>3</sup> *TSR II Information Report and Data Package* provides for a strategy in the first decade to elevate harvest levels to access legacy mountain pine beetle attacked stands

Obviously these adjustments have a significant impact on the potential harvest flow in the long term. Further refinement of these adjustments will be crucial in illustrating that a secure and sustainable long term harvest flow is achievable in the Williams Lake TSA.

| <b>ISSUE</b> | <b>VOLUME (m3/year) INCREASE</b> | <b>PERCENT INCREASE</b> |
|--------------|----------------------------------|-------------------------|
| SIBEC        | 641,000                          | 26.49                   |
| OGSI         | 321,000                          | 13.27                   |

Silviculture scenarios were also assessed against the base case to determine potential impacts of implementing specific treatment regimes. Increases to the sustainable harvest volume ranged from 0% to 5.25 %, depending on the scenario that was assessed, as summarised in the table below.

| <b>ISSUE</b>                                    | <b>VOLUME (m3/year) INCREASE</b> | <b>PERCENT INCREASE</b> |
|-------------------------------------------------|----------------------------------|-------------------------|
| Genetically improved stock                      | 126,990                          | 5.25                    |
| Rehabilitation of Repressed Pli                 | 35,800                           | 1.45                    |
| Reduction of net downs due to future roads      | 23,000                           | 0.95                    |
| Reductions in green-up timelines by five years  | 19,000                           | 0.62                    |
| Fertilisation which increases volume by 15m3/ha | 8,800                            | 0.33                    |
| Immediate elimination of backlog NSR            | 2,000                            | 0.1                     |
| Elimination of backlog NSR within 5 years       | < 2,000                          | < 0.1                   |
| Alternate spacing densities                     | 0                                | 0                       |

### **Three Western Supply Blocks (Chilcotin, Tatla and Anahim Supply Blocks)**

Similar to the results of analysis in the Main TSA, the impacts of including OGSi and SIBEC adjustment factors are the two potential initiatives that provide the largest opportunity:

- 1) The OGSi adjustment contributes to a 31.06 % increase in harvest flow.
- 2) SIBEC adjustment contributes to a 56 % increase in sustainable harvest flow.

As in the Main TSA, silviculture scenarios had a lesser impact, but still have potential to enhance the overall availability of timber. The most significant impact was the implementation of a stand rehabilitation program of 20, 000 ha (4000 ha/year for 5 years) which has a result of increasing the minimum available volumes by 2.49%.

### **Strategic Focus**

The key factors that have the most significant impact on the harvest flow for the Williams Lake TSA are the redefinition of the THLB, and the recognition of appropriate OGSi and SIBEC adjustments. The continued development of accurate, fully representative site index estimates will undoubtedly identify greater harvesting opportunity than what is currently believed to be available over the long term. Further refinement of site productivity estimates in this TSA should be considered a priority.

As indicated in this analysis, continued increase in the use of genetically improved stock will have a positive impact on the available long term volumes. Other silvicultural treatments (eg. commercial thinning and juvenile spacing), although not having a significant impact on long term harvest levels, may help to mitigate ‘access to timber’ and scheduling issues at the operational level.

Under the Cariboo-Chilcotin Land Use Plan (CCLUP) enhancement opportunities are not singularly focused on the acquisition of volume. Instead enhancement opportunities are intended to provide a mechanism to maintain an even flow rate within specific areas where harvesting may be limited due to other constraints. This type of enhancement approach will provide greater management flexibility and operational certainty in the short and long term. To determine the true potential of enhancement opportunities in the context of the CCLUP, further assessment is required at a sub-regional and landscape unit level.

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## 1 INTRODUCTION

This analysis has been completed in response to a provincial initiative to develop comprehensive silviculture investment strategies for all management units in British Columbia. The development of such strategies will help to identify incremental silviculture treatment priorities and ensure that opportunities for timber enhancement are maximized.

In 1996 the Timber Supply Review and Allowable Annual Cut (AAC) determination was released for the Williams Lake Timber Supply Area (TSA). The analysis identified a significant short term decline in timber supply for the Main TSA. This shortfall was largely a result of a high component of younger stands that were projected to be unavailable for harvest until later in the planning horizon. This projected decline necessitated a refocus of efforts to further research and identify management practices that may reduce the shortfall and help improve the availability of harvestable timber. Initiatives such as assessing site productivity, clearly defining the harvesting landbase and identifying silviculture activities to increase timber production have been key areas where efforts have been focused.

In 1998 a *Stand Treatment Analysis* was conducted for the Williams Lake TSA under the direction of the Cariboo Region Timber Investment Strategy Committee. (TISC). The results of the analysis identified ‘opportunities’ for an increase in timber supply in the Williams Lake TSA, some which could be driven by an enhancement of incremental silviculture activities. The *Stand Treatment Analysis* used, for the most part, the data and assumptions generated for TSR 1.

The Williams Lake TSA Options Working Group (OWG), comprised of Ministry of Forests and Industry representatives, was formed in late 1998, to “...aggressively research, determine and document mitigating factors which (have a high probability to ) alleviate the downward AAC

pressures in the Williams Lake TSA....”<sup>4</sup>. The OWG broadened the scope of issues defined as impacting timber supply, took an active role in redefining ‘current management’ and initiated the development of a range of modelling scenarios.

The analysis contained within this report has built on the strategies and scenarios introduced by TISC and the OWG. The input provided by the various working groups during the past several months has further refined modeling criteria and more clearly identified realistic opportunities for enhancement of timber supply. The work conducted to date in the Cariboo Forest Region, by various working groups, has successfully contributed to the provincial initiative of developing comprehensive silviculture investment strategies in all TSAs.

## 1.1 Objectives

Although a broad range of management strategies have been assessed by TISC and OWG in an attempt to enhance timber supply, the primary focus of this report is to identify *potential silviculture strategies* and present the supporting analysis results. The results presented herein will include a ‘base case’ (which closely parallels TSR II) and will also present specific ‘scenario’ analysis around the base case to test the impacts of selected silviculture treatments. This analysis also presents the impact of incorporating Old Growth Site Index (OGSI) adjustments, and the ‘new’ ‘Site Index - Biogeoclimatic Ecological Classification’ (SIBEC) factors for the Cariboo Forest Region. Specific analysis scenarios and results are presented in the ANALYSIS section of this report. The results will be utilized to define the potential for an enhanced incremental program that is intended to focus on incremental regimes presenting the greatest potential for timber enhancement.

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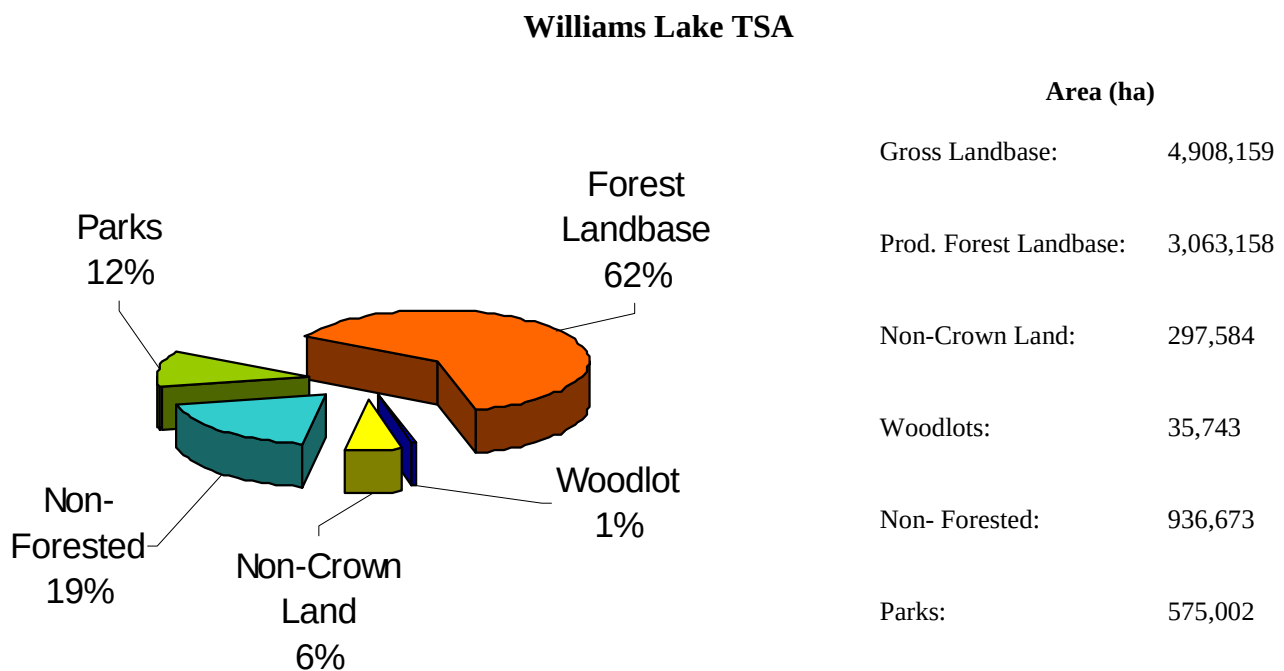
<sup>4</sup> Options Working Group “Terms of Reference” (November, 1998)

## 2 TSA DESCRIPTION

The Williams Lake TSA is located within Cariboo Forest Region in south-central British Columbia. The area falls under the administration of three Ministry of Forests (MoF) Districts: Williams Lake, Horsefly and Chilcotin (Alexis Creek). The Williams Lake TSA is bordered by two provincially significant parks (Tweedsmuir and Wells Gray ) and has several smaller provincial parks within its boundaries. The characteristic diverse terrain , climate and vegetation throughout the area present numerous forest management challenges.

The following chart illustrates the area breakdown for the TSA. A complete set of figures illustrating the timber landbase, species composition and site indices are included in the Landbase Inventory Section (5.1.1) of this report.

**Figure 1.**



### 3 MANAGEMENT ISSUES

Historically, forest management practices in the WL TSA have been influenced by a variety of ecological and economic factors.

The following summary outlines some of the key management issues in the WL TSA.

| Issue                               | Management Implication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Currently Unharvested Stand Types   | <p>This issue has had a significant influence in determining the timber harvesting landbase.</p> <p>Base Case – has redefined and reduced the area defined as ‘unharvested’ within the Main TSA and three Western Supply Blocks. The result has been an increase in the timber harvesting land base (THLB) by approximately 745,000 ha.</p> <p><b>Opportunity:</b> potential rehabilitation of a portion of the remaining ‘unharvested’ stand types may present an additional opportunity for influencing the THLB as well as maximising overall productivity.</p> |
| Age Distribution                    | <p>Due to recurrent fires, beetle infestation, and harvest history, TSR I identified a predominance of lower age classes in the THLB, especially in the Williams Lake and Chilcotin Forest Districts. The short term fall down in TSR I was a result of this concentration of area in the lower age classes.</p> <p>The re-definition of unharvested stand types in the new base case has significantly improved the age class distribution in the THLB thus eliminating the short term falldown effect.</p>                                                       |
| Volume Estimates (unmanaged stands) | <p>Volumes in existing stands have a significant impact on the outcome of timber supply analysis. TSR 1 analysis has shown extreme sensitivity to changes in mature stand volumes. Audit results suggest that VDYP was providing an overestimate of mature volumes.</p> <p>To improve estimates, a Volume Adjustment Factor (OAF) in the FSSIM has been applied to account for the volume overestimation</p>                                                                                                                                                       |

by VDYP for the mature stands. These adjustments are reflected in the base case run.

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lake and Riparian Buffers | A portion of the timber harvesting landbase is within designated lake and riparian buffers. ‘Special Management’ criteria in these areas will not always impact long term harvest flows, but short term access to timber may be restricted depending on specific management objectives.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Visual Management         | The requirement to meet visual management objectives may, in specific instances, have the effect of lengthening rotations and restricting short term access to timber.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Site Productivity         | <p>Site productivity estimates have a significant impact on harvest flow projections. Ongoing SIBEC and OGSi projects are continuing to refine site productivity estimates throughout the TSA.</p> <p><b>OGSi and SIBEC scenarios have been tested (section 5.2.2)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Greenup/Adjacency         | <p>Greenup timelines can influence short term access to timber due to adjacency constraints. Realistic greenup timelines, especially in IDF areas, are poorly represented at this time. Ongoing work to refine greenup estimates will introduce more realistic results. A 2m greenup has been suggested for some areas in the TSA, although the implications of utilising this timeline have not been fully assessed.</p> <p>The improvement in age distribution has reduced the impact of adjacency issues on timber supply, however, ensuring that greenup timelines are minimised will further maximise timber availability and harvesting flexibility.</p> <p><b>Opportunity: reduce greenup timelines to minimise adjacency constraints. A greenup scenario has been tested to identify potential impacts on the base case (section 5.3.2).</b></p> |
| Roads Trails and Landings | <p>Reductions for roads trails and landings have a direct impact on the timber harvesting land base. It is believed that current reductions to RTL’s are somewhat conservative. Additional work is required to accurately define net losses as a result for RT and L’s</p> <p><b>Opportunity: reduce RTL net down factors to a representative level. Minimise reductions to THLB. A reduction in future roads scenario has been tested (section 5.3.3)</b></p>                                                                                                                                                                                                                                                                                                                                                                                           |

**Forest Health** Mountain Pine Beetle has historically had a significant influence on harvesting in this TSA. The re-definition of areas eligible for ‘pine beetle’ harvest in the base case has improved the identification of beetle harvest areas. Issues around assessing biodiversity impacts and establishing reforestation regimes still prevail. Redefinition of pine beetle harvest areas since TSR I has helped clarify actual volume removal within beetle damaged areas.

### 3.1 Cariboo-Chilcotin Land Use Plan

Under the Cariboo – Chilcotin Land Use Plan (CCLUP), several management strategies are now in place within the Cariboo Forest Region. Three of major significance are:

| Strategy                        | Management Implications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mule Deer Winter Range Strategy | Harvesting is limited to partial cutting regimes within MDWR areas, effectively increasing rotation ages. Block size and distribution also will impact harvest flow. Currently, growth and yield information for partially cut stands is under refinement through ongoing Prognosis BC development.<br><br>Incremental treatments may be very effective at meeting habitat enhancement objectives, although direct enhancement to timber supply may be minimal due to limited access and lengthened rotations |

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Caribou<br>Management<br>Strategy            | <p>‘No Harvest’ areas have been defined.</p> <p>Harvesting within modified harvest areas limits blocks sizes, re-entry timing, block location and orientation. The need to meet caribou management objectives may impact short term timber availability as well as lengthen rotations</p> <p>In higher elevation areas, reforestation becomes expensive and difficult to achieve especially in areas with cool soils, short growing seasons and high brush hazard.</p> |
| The Biodiversity<br>Conservation<br>Strategy | <p>Harvesting must address biodiversity requirements on a landscape unit basis. The need to manage old growth can affect harvest flow and re-entry periods. TSR currently applies old growth draw downs, for the first 100 years in the ERDZ and SRDZ areas. Current base case results indicate approximately 46 landscape unit/NDT/BEC areas (within 32 landscape units) are exhibiting old growth deficits. (see Appendix 6)</p>                                     |

These strategies provide direction under the CCLUP, in a more specific context, and attempt to define site specific management requirements. Implementing management regimes to meet wildlife and biodiversity objectives can have significant impact on the amount of timber available for harvest in a specific timeframe. “Modified” silviculture prescriptions under these strategies will likely have an impact on harvest flow and will further emphasise the need for a clearly defined incremental silviculture program in the Region. Almost one half of the THLB is managed recognising other land use issues and uses some form of modified harvest, other than conventional clearcutting with a ‘normal’ rotation (Figure 2).

The ‘Enhanced Resource Development Zone’ (ERDZ), approximately 54 % of the WL TSA, has the largest area available for timber production. As a result, the greatest opportunities for incremental enhancement will likely be found within this zone. Due to a smaller area targeted for timber access in the ‘Special Resource Development Zone’ (SRDZ) and ‘Integrated Management Zone’ (IRMZ), the implementation of an incremental program may be more limited in these areas than in the ERDZ. In some cases, incremental silviculture treatments may

help to enhance other forest attributes, but this will not likely be true in all instances. At this time, we are able to make broad assumptions about various silviculture treatments and their contribution to other forest resources. However, actual impacts are still largely undefined.

The uncertainty around managing under the CCLUP zone designations clearly outlines the need for more comprehensive analysis regarding timber availability and harvest flow rates under the CCLUP.

#### **4 ENHANCEMENT OF TIMBER QUALITY**

Historically timber quality objectives in the Williams Lake TSA have not focused on identification of the premium saw log component of the inventory profile. Instead the focus has traditionally centred on identifying the “lower end” of the timber profile from a “Problem Forest Type (PFT)” or “Opportunity Wood” perspective. In spite of the absence of pulp mills in the TSA, the major licensees have demonstrated substantial harvesting performance down to 65 m3 per hectare. The *1992 20 Year Availability Assessment Report* determined there were insufficient sources of timber from the “traditional” saw log land base. Therefore, the PFT land base was accessed in order to stabilise the short term harvest level in the main TSA and to help offset the pending medium term short fall identified in the *TSR 1 Analysis Report*. The definition of the PFT land base was revised in the *TSR II Data Package* to reflect current performance levels. Local sawmill capacity has evolved to efficiently process the lower spectrum of the inventory profile.

From a fibre supply perspective, local proponents of this exercise felt that identification of saw log and premium log quality objectives was not required at this time. Instead, resolution of other opportunities (eg. CCLUP, land base classification and genetic gain issues) was felt to be more pressing. Timber quality objectives will be assessed under a separate initiative<sup>5</sup>.

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<sup>5</sup> regional, district and licensee stakeholders are currently formulating a process for a regional timber enhancement strategy

## 5 ANALYSIS

This analysis has modelled a base case and evaluated several silviculture scenarios in terms of their impacts on timber supply. In modelling the base case, the land use assumptions and management strategies defined in the Williams Lake Timber Supply Area Timber Supply Review II (TSR II) Data Package (August, 1999) were used. MoF Cariboo Region provided the land base and forest inventory information (FC1, non-standard coverages and FIP files). The FIP files were issued in 1998 and projected to year 2000. The data set used by the MoF Timber supply data set differed from the data used in this analysis due to:

- FIP files and the FC1 were issued one year earlier, and
- Chilcotin Depletion Coverage of mountain pine beetle harvest was not in the data set.

The main TSA and three Western Supply Blocks were modelled separately. However, the basic modelling process and management assumptions were the same unless specifically noted.

The scenarios evaluated were: application of SIBEC, application of OGSi adjustments, fertilisation, juvenile spacing, backlog NSR elimination, future road reductions, green-up age reduction and planting genetically-improved stock. Although commercial thinning/partial cutting scenarios were not specifically modelled, it is believed that a commercial thinning program may have a significant impact on alleviating short term adjacency issues and biodiversity constraints. Further discussion on the potential role of commercial thinning is included in the Partial Cutting section (5.3.7) of this report.

The FSSIM (version 3.0a, BC Ministry of Forests), a forest estate simulation model, was used to forecast the harvest flows for 250 years. The MoF Variable Density Yield Projection (VDYP 6.4) model was used to develop yield curves for natural stands and the Table Interpolation

Projection System for Yields (TIPSY 2.1) model was used to develop yield curves for managed stands.

## **5.1 Information Preparation**

Three categories of inputs are required to complete a timber supply analysis:

- land base inventory,
- timber volume growth curves,
- management practices.

### **5.1.1 Landbase Inventory**

In addition to the forest inventory information (FIP and FC1), the MoF provided the non-standard coverages (Caribou habitat, Mule Deer Winter Range, Landscape Unit boundaries etc.) needed for this analysis. The FC1 and the non-standard coverages were overlaid using the GIS tool ARC/INFO. The FIP files were projected to year 2000.

The timber harvesting landbase (THLB) was obtained by reducing the total landbase according to the land use and management assumptions defined in the TSR II Data Package.

Table 1. details the landbase net down in hectares for the TSA.

**Table 1. Williams Lake TSA OWG/TSR II Area Netdown Summary**

| CATEGORY                                   | Area(ha) of the Three Components |   |                  |   |                | Area (ha) of the Whole TSA |                  |                        |
|--------------------------------------------|----------------------------------|---|------------------|---|----------------|----------------------------|------------------|------------------------|
|                                            | Main TSA                         | + | Three WSB        | + | PA16           | =                          | Whole TSA        | % of Gross<br>% of GPA |
| <b>Gross area</b>                          | <b>2,877,516</b>                 |   | <b>1,839,017</b> |   | <b>191,625</b> |                            | <b>4,908,159</b> | <b>100.00%</b>         |
| Less:                                      |                                  |   |                  |   |                |                            |                  |                        |
| Non_Crown land                             | 441,438                          |   | 359,080          |   | 70,129         |                            | 870,647          | 17.74%                 |
| Woodlot                                    | 14,883                           |   | 19               |   | 596            |                            | 15,498           | 0.32%                  |
| Parks                                      | 15,816                           |   | 8,857            |   | 1,290          |                            | 25,964           | 0.53%                  |
| Non_Forest_ Area (NFA + NPFA)              | 317,228                          |   | 543,935          |   | 72,359         |                            | 933,522          | 19.02%                 |
| <b>Gross Productive Area (GPA)</b>         | <b>2,088,225</b>                 |   | <b>927,125</b>   |   | <b>47,251</b>  |                            | <b>3,062,601</b> | <b>62.40% 100.00%</b>  |
| less:                                      |                                  |   |                  |   |                |                            |                  |                        |
| Classified roads                           | 50,477                           |   | 8,658            |   | 919            |                            | 60,054           | 1.96%                  |
| Non_commercial Cover                       | 914                              |   | 509              |   | 9              |                            | 1,432            | 0.05%                  |
| ESA                                        | 49,267                           |   | 43,055           |   | 7,354          |                            | 99,676           | 3.25%                  |
| Inoperable                                 | 38,765                           |   | 29,163           |   | 1,191          |                            | 69,119           | 2.26%                  |
| Current unharvested stand type             | 124,423                          |   | 173,919          |   | 0              |                            | 298,342          | 9.74%                  |
| Unclassified road                          | 0                                |   | 0                |   | 0              |                            | 0                | 0.00%                  |
| Wildlife (Caribou)                         | 66,536                           |   | 2,345            |   | 499            |                            | 69,380           | 2.27%                  |
| Lake buffer                                | 2,894                            |   | 0                |   | 95             |                            | 2,989            | 0.10%                  |
| Riparian                                   | 33,596                           |   | 15,382           |   | 652            |                            | 49,630           | 1.62%                  |
| <b>Current Timber Harvesting Land base</b> | <b>1,721,354</b>                 |   | <b>654,095</b>   |   | <b>36,531</b>  |                            | <b>2,411,980</b> | <b>78.76%</b>          |
| less:                                      |                                  |   |                  |   |                |                            |                  |                        |
| Future roads                               | 65,335                           |   | 25,264           |   | 1,815          |                            | 92,414           | 3.02%                  |
| <b>Long term THLB</b>                      | <b>1,656,019</b>                 |   | <b>628,831</b>   |   | <b>34,716</b>  |                            | <b>2,319,566</b> | <b>75.74%</b>          |

The THLB includes all area available for timber extraction, even those subject to constraints such as selection harvesting or visual quality requirements.

The gross landbase of TSR I and TSR II is of the same size, but the THLB in TSR II is 745,540 ha greater than that in TSR I. The increase is mainly due to the redefinition of Problem Forest Types. The reduction for ‘Problem Forest Types’ in TSR I was 1,214,566 ha while the reduction in TSR II under the comparable category ‘Currently Unharvested Stand Types’ was 298,342 ha.

The following chart illustrates the components of the THLB by management and land use issues. (Refer to Appendix 4 for tabular summary)

**Figure 2.**

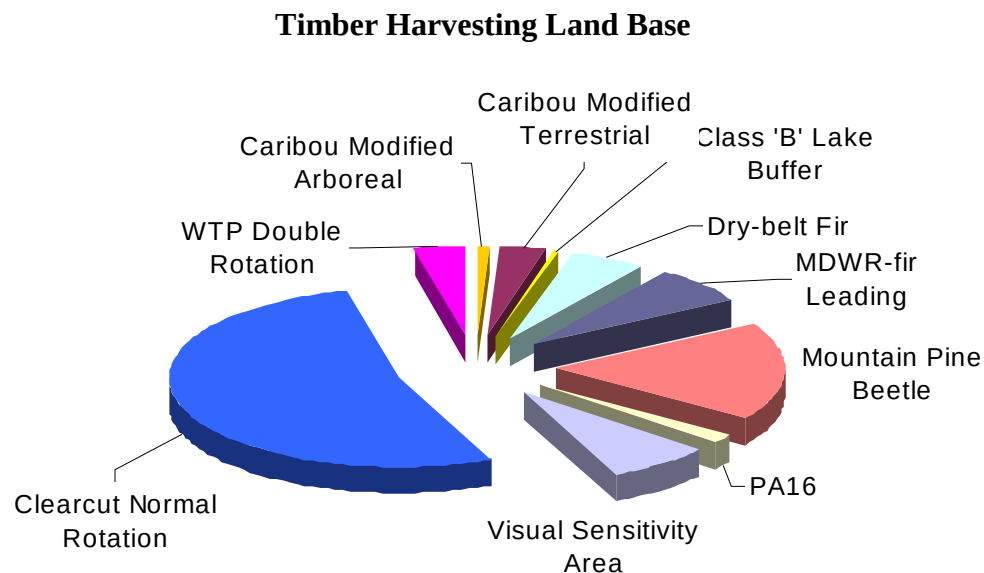


**Figure 3.**

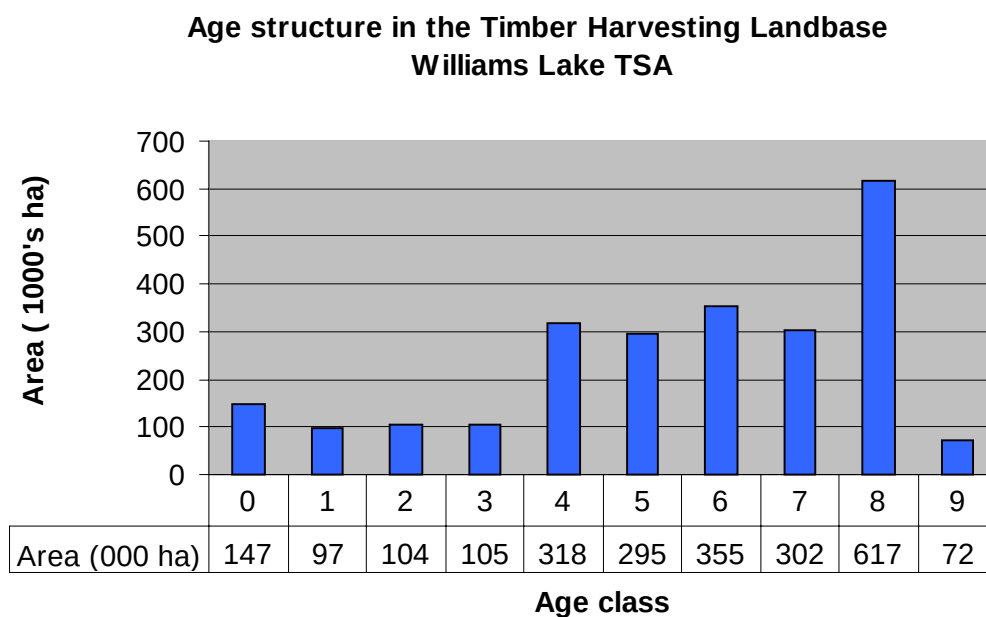


**Figure 4. Site Index Distribution**

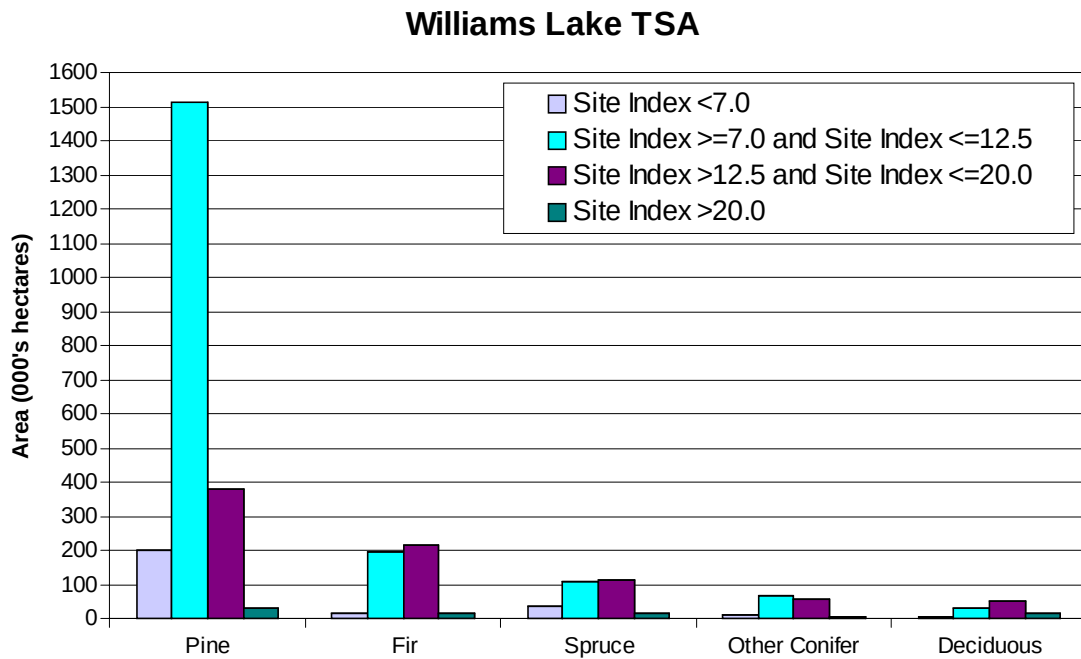
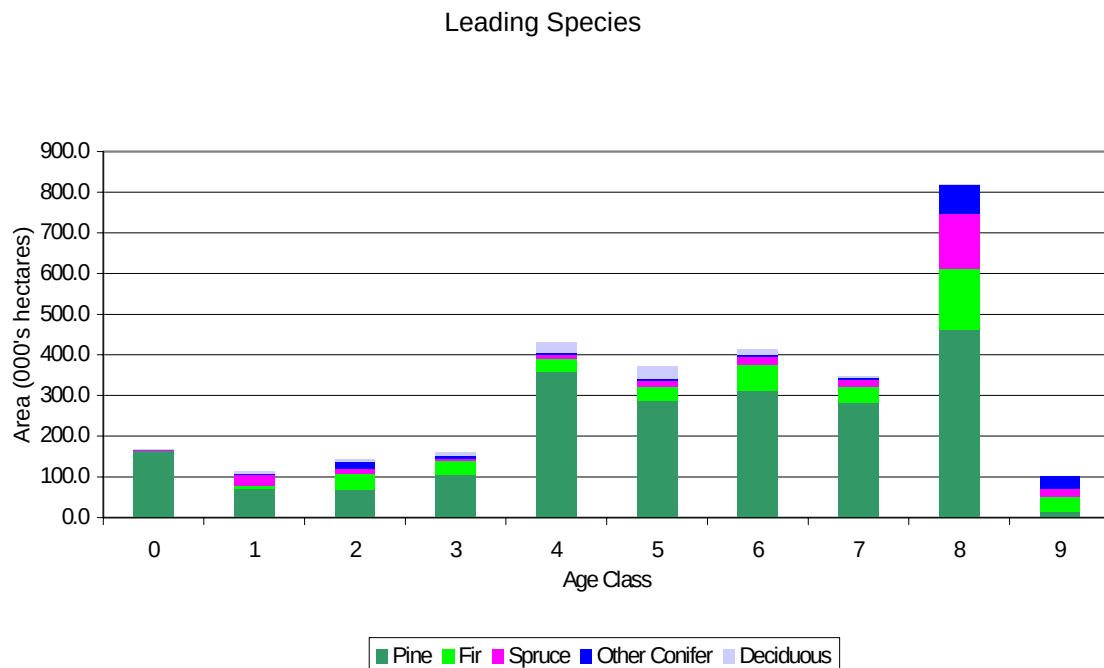


**Figure 5. Species Composition**



### 5.1.2 Timber Growth and Yield

The height and volume growth of stands was projected by inputting stand attributes (species composition, crown closure or stand density, and site productivity) and silvicultural treatments (planting, thinning etc) into growth models.

- 1 The VDYP model was used to project the growth of the following stand types:
  - existing stands of current age 34 or older;
  - existing stands of current age between 21 and 34 and having density above 10,000 stems/ha;
  - existing stands for selection harvesting (Dry-belt Fir stands and Mule Deer Winter Range Fir leading stands);
  - deciduous-leading stands and low site stands (in PA 16 area); and
  - mountain pine beetle attacked stands (attack class > 3) and not harvested during the first five years.
- 2 The TIPSYP model was used to project the growth of the following managed stands
  - existing stands of age 20 or younger;
  - existing stands of current age between 21 and 34 and having density below 10,000 stems/ha; and
  - regeneration non-selection harvesting stands.
- 3 The volume growth of selection harvesting stands (Dry-belt Fir stands and MDWR fir leading stands) after the first entry was not projected using growth models. Instead, following current Timber Supply Branch standards, growth is assumed to be 1 m<sup>3</sup>/year/ha in Dry-belt Fir stands and MDWR Fir leading low crown closure stands and 0.66 m<sup>3</sup>/year/ha in MDWR Fir leading medium and high crown closure stands.

### 5.1.3 Management Practices

Forest management practices were modelled as described in the TSR II Data Package. Following is a summary:

|                                      |                                                                                                                                                                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green-up                             | Applied to all areas by landscape unit.<br><br>Visual Sensitivity Area (VSA) and lakeshore buffer have stricter requirements than the rest of the landbase.<br><br>Green-up requirement did not apply to selection harvesting stands. |
| Old Growth                           | Area requirement and old + mature area requirement were applied by landscape unit/NDT/BEC.                                                                                                                                            |
| Selection Harvesting                 | Criteria were applied to the dry-belt Douglas fir stands, MDWR fir leading stands and ‘Caribou Area’ selection harvesting stands. (clearcut vs. selection harvest areas - Appendix 4)                                                 |
| Utilisation Level                    | 12.5 cm (DBH) for lodgepole pine stands and 17.5 for all other stands.                                                                                                                                                                |
| Minimum Stand Height for Harvesting  | 14-16 meter cruise height varying with leading species and forest district.                                                                                                                                                           |
| Minimum Volume for Harvesting        | 65m <sup>3</sup> /ha. Minimum volume for harvesting and minimum stand height for harvesting were used together to determine the minimum harvest age.                                                                                  |
| Regeneration Delay                   | 2 years for plantation stands<br><br>4 years for natural regeneration stands                                                                                                                                                          |
| Mountain Pine Beetle attacked stands | Harvest target of 500,000 m <sup>3</sup> /year for the first five years from the Mountain Pine Beetle stands with attack class > 3.                                                                                                   |

## 5.2 Analysis Methods

In this analysis, all modelling was completed using FSSIM 3.0 (MoF, 1998) and the simulation horizon was set to be 250 years. The “Relative Oldest First” harvest rule was used.

The following rules were applied when selecting harvest flows to be evaluated:

- For the first five years, the mountain pine beetle stands with attack class > 3 had a higher harvesting priority than other stands but they could only contribute up to 500,000 m<sup>3</sup>/year.
- Among the total non-recoverable losses of 53,500 m<sup>3</sup>/year, a portion of 39,000 m<sup>3</sup>/year was assumed to be from the main TSA and 13,500 m<sup>3</sup>/year from the three Western Supply Blocks. The split was made based on the relative size of the timber harvesting landbase.
- Main TSA: to support a harvest level of 2,883,000 m<sup>3</sup>/year (including 2,600,000 m<sup>3</sup>/year for current AAC and 288,300 m<sup>3</sup>/year from mountain pine beetle stand) plus the non-recoverable losses for the first five years; 2,600,000 m<sup>3</sup>/year plus the non-recoverable losses from year 6 to year 10; then to lower the period harvest level by up to 10% until a sustainable harvest level for the remaining 240 years was found.
- In the three Western Supply Blocks, to find the sustainable maximum even flow harvest level plus the non-recoverable losses. For the first five years, the mountain pine beetle stands contribute up to 217,000 m<sup>3</sup>/year.
- In the main TSA, if any scenarios can support a even-flow harvest level higher than 2,883,300 m<sup>3</sup>/year plus the non-recoverable losses, to find the maximum even flow harvest level.

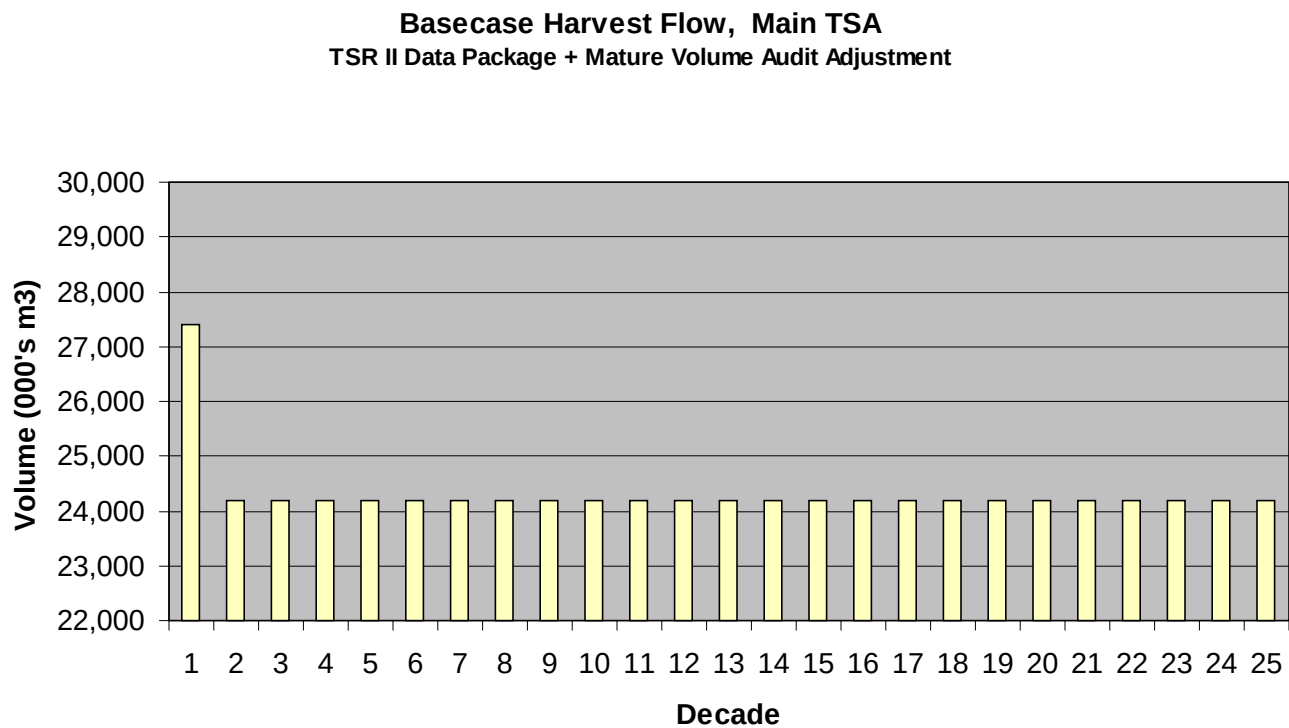
## 5.3 Main TSA Results

### 5.3.1 Base Case

This analysis was completed using the land use assumptions and management strategies defined in the Williams Lake TSR II Data Package. The mature inventory audit adjustment was built into the yield curves of existing stands. MoF Timber Supply Branch provided the equations for mature volume adjustments.

(The following results for the Main TSA are summarised in a tabular format in Appendix 2.)

**Figure 6** - shows the harvest flow by decade in the Main TSA.

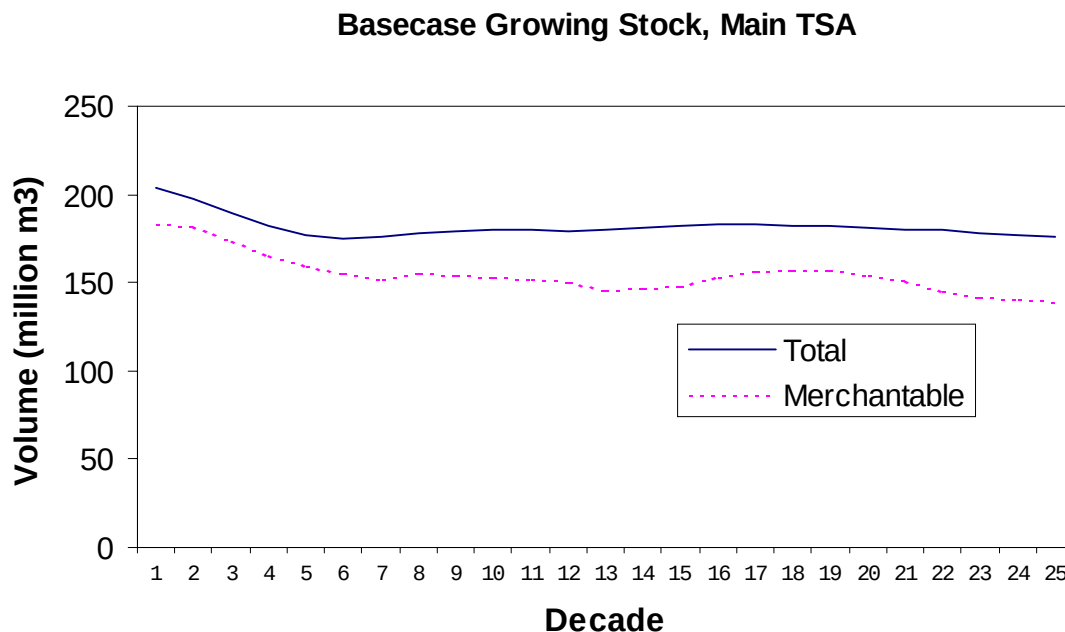


The harvest rate in decade 1 is composed of annual harvest volume 2,883,000 m<sup>3</sup> for the first five years and 2,600,000 m<sup>3</sup> for the following five years. Among the 2,883,000 m<sup>3</sup>/year for the

first five years, a portion of 283,000 m<sup>3</sup>/year is the result of mountain pine beetle salvage harvesting. After decade 1, the annual harvest volume needs to be lowered to 2,419,800 m<sup>3</sup>/year in order to be maintained for the remaining 240 years. Both clearcut and selection harvesting stands contribute to the harvest volume. The average contribution of selection harvesting stands (i.e., Fir stands in Mule Deer Winter Ranges, Dry-belt Fir stands and Caribou Modified Harvest stands) is about 7.3% varying between 2.3% (decade 4) and 14.5% (decade 13). Refer to Appendix 4 for a table illustrating the proportion of clearcut versus selectively harvested stands

Figure 7 shows that current inventory volume on the ground is high. This is due to the high percentage of stands with age class 4 and higher (see Figure 3). Due to the effect of harvesting on growing stock projections, availability of growing stock is specific to a harvest flow.

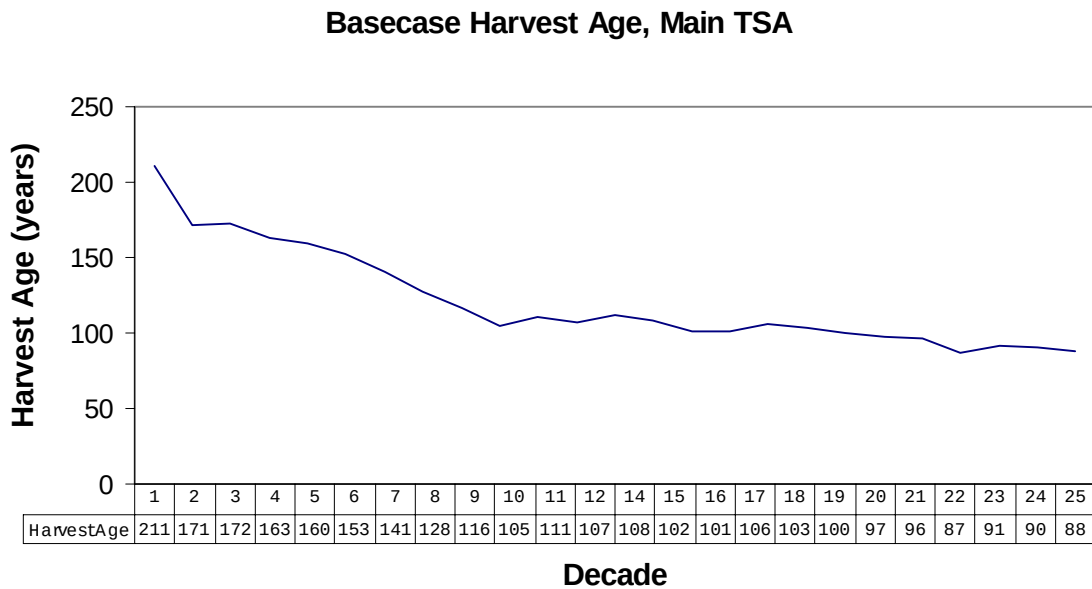
**Figure 7.**



The critical time, which is the time with minimum available merchantable growing stock and limiting the harvest flow from further increase, is at the end of the simulation (in 250 years). The fact that the critical period is far in the future indicates that there are opportunities to increase the harvest flow. Any treatments which can increase the growing stock before the critical period can help to increase the overall harvest flow.

The area-weighted harvest age by decade decreases over time (Figure 8). In 250 years, the average age of the stands harvested is about 80 years. Figure 10 also indicates that current stands can support the harvest flow for about 110 years.

**Figure 8.**



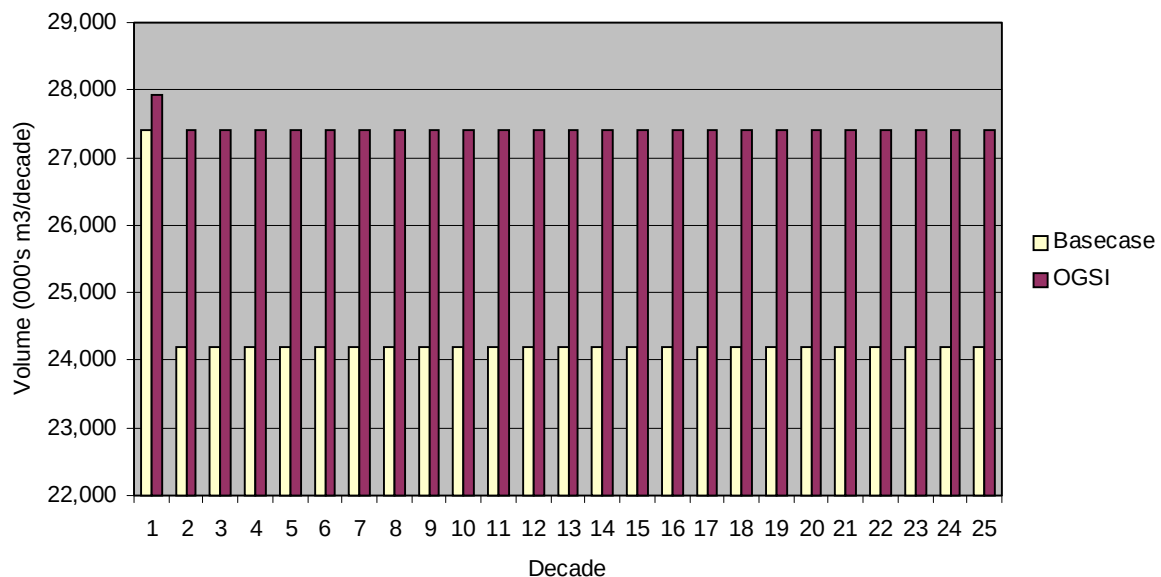
Old growth requirements are a limiting factor in some landscape units. In 46 LU/BEC/NDT units there is not enough old growth area and these units are inaccessible for harvest for a period of time ranging from 5 to 130 years (Appendix 6). More detailed review of the ‘inaccessible’ landscape units will be required to fully determine harvest potential and impacts to short term timber availability.

### 5.3.2 Old Growth Site Index Adjustments

The site index estimates on old growth (>140 years old) stands are underestimated for managed stands of the same species on the same site. In 1998 the MoF Research Branch updated the adjustment equations and defined the application of these equations in terms of stand type, inventory site index range and biogeoclimatic ecological classification (BEC) zone (Nussbaum 1998). Adjustment equations for interior spruce and lodgepole pine stands are available in the document. Eligible spruce stands are those with age > 140, within site index range 5.7 to 25.4 and located in BEC zones ESSF, ICH, MS and SBS. Eligible lodgepole pine stands are those with age >140, within site index range 7.3 to 26.7 and located in BEC zones BWBS, ESSF, ICH, IDF, MS, SBPS and SBS.

In analysing the scenario, the yield curves, green-up ages and minimum harvesting ages of each analysis unit were recalculated using the adjusted site indices and applied after the eligible stands are clearcut for the first time.

With OGSi adjustments, the harvest flow can be increased to 2,740,800 m<sup>3</sup> per year starting from decade 2, which is 13.3% higher than that in the base case (Figure 9).

**Figure 9.****Application of OGSi Adjustment**

With OGSi adjustments, the managed stands of the eligible species have greater volume growth rate, less time needed for reaching green-up height and lower minimum harvest age than in the base case. Even though only managed stands benefit from the adjustments, the harvest flow can be increased from the beginning of the simulation because the effects of OGSi adjustments take effect before the critical period.

Availability of growing stock and harvest ages follow similar trends to what was identified in the base case

### 5.3.3 Application of SIBEC

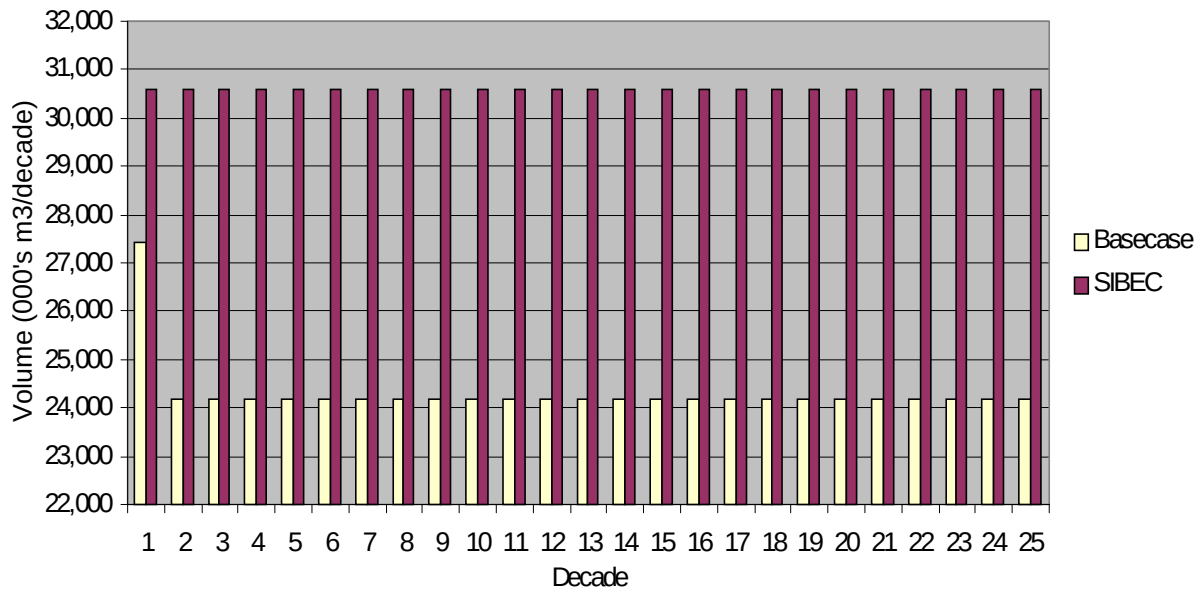
The MoF updated the research results of using BEC units to classify the site productivity and published the Site Index – Biogeoclimatic Ecological Classification (SIBEC) in 1997 (Site Index Estimates by Site Series, 1997). The document provides a site index for each applicable combination of leading species/site series/BEC subzone. In analysing this scenario, the SIBEC site index was used to replace the inventory site index in calculating yield curves, green-up ages and minimum harvest ages for managed stands.

Since site series were not available in the inventory files, this scenario used the site index of site series 1 to represent the site productivity of *all* sites. This method was employed in an attempt to obtain a reasonable average for all sites across the TSA. Site series 1 is the most common site series and was determined to provide the most ‘representative’ estimate, in the absence of more detailed information. (Appendix 5).

After application of SIBEC, an even-flow harvest level of 3,060,800 m<sup>3</sup>/year can be maintained through the entire simulation horizon. The increase is 11.65% for decade 1 and 26.49% thereafter from the base case (Figure 10). This increase occurs because the SIBEC site indices are generally higher than what the current inventory supplies.

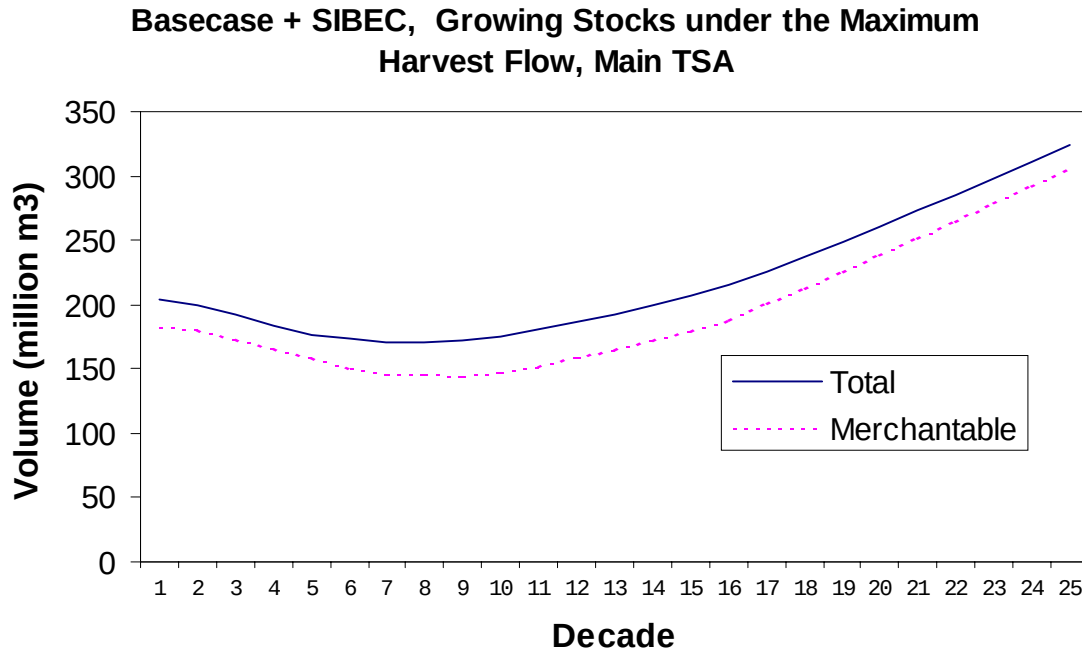
**Figure 10.**

**Application of SIBEC Adjustments**



After application of the SIBEC and increase in the harvest flow, the growing stock projection is different from the base case . Figure 11 shows that the critical period under this scenario is moved forward to decade 8 or decade 9. After the critical period, the growing stock increases, which indicates that the harvest flow after decade 8 can be increased above 3,060,000 m3/year.

**Figure 11.**



The impact of the OGSi and SIBEC adjustments is very apparent in these scenarios. To ensure that future analysis fully represents true site potential, it is critical that further work be conducted to refine site productivity estimates across the TSA.

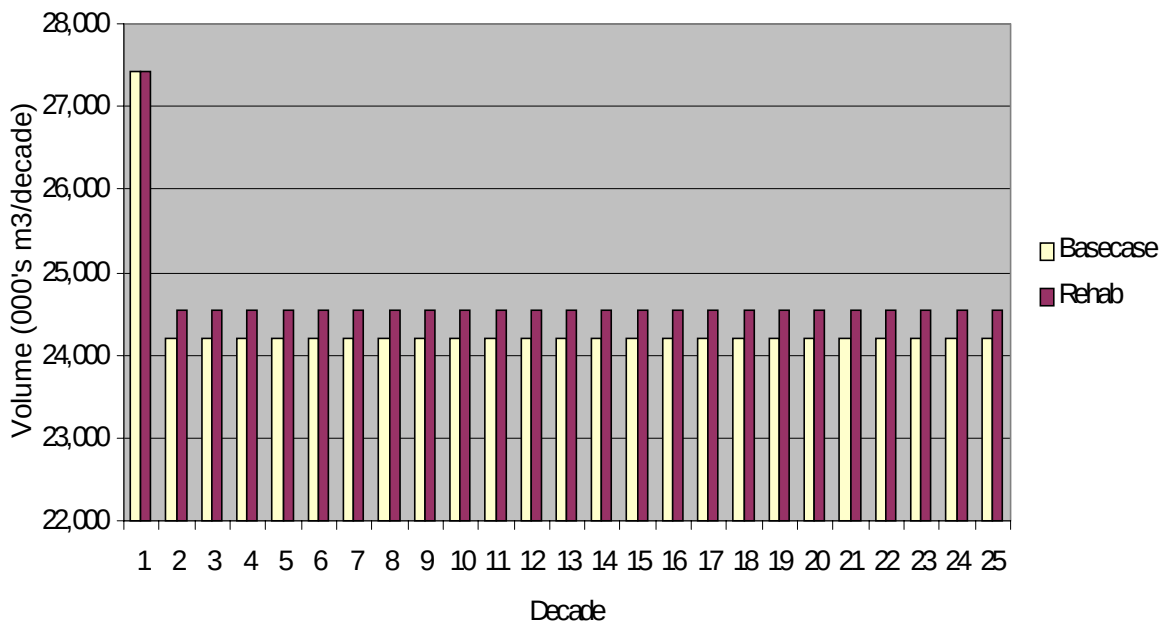
### 5.3.4 Rehabilitation of Repressed Pine Stands

There are about 35,000 ha of Pli stands with an inventory site index less than 7 outside of the PA16 area in the main TSA. These areas are excluded from the timber harvesting landbase as ‘low sites’ in the base case.

This scenario tests the impacts of rehabilitating 30,000 ha of these stands in the main TSA and 20,000 ha in three Western Supply Blocks. The stands are rehabilitated in five years, 6,000 ha/year in the main TSA and 4,000 ha/year in the three Western Supply Blocks. The stands are harvested with no volume extraction and then planted with genetically improved stock. The site index after the rehabilitation is assumed to be 12.

With 30,000 ha repressed Pli stands rehabilitated, the harvest flow from decade 2 can be increased to 2,454,800 m<sup>3</sup>/year, which is 1.45% higher than the base case (Figure 12).

**Figure 12.**



### 5.3.5 Silviculture Scenarios

The following silviculture scenarios represent ‘preferred’ treatment regimes which are consistent with current management priorities and expected to be operationally achievable during the next several years. The scenarios illustrated in this report have been developed as a result of input received from operational staff as well as the refinement of previous analysis scenarios (TISC).

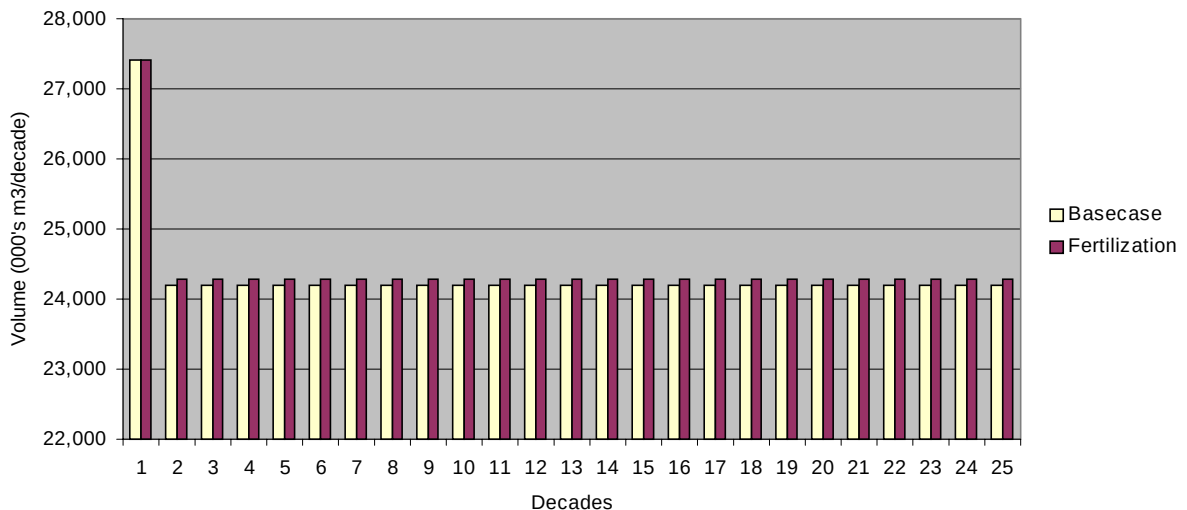
Scenarios testing the effects of greenup periods, fertilisation, alternate spacing densities, elimination of backlog NSR, use of genetically improved stock and reduction in roads were tested in the Main TSA. The following results focus on the harvest flow of each scenario and its comparison to the base case. All harvest flows are net of non-recoverable losses.

#### 5.3.5.1 Fertilization

This scenario assumes that fertilised stands have an average volume increase of 15 m<sup>3</sup> /ha at harvest. The number of stands eligible for fertilisation (i.e., Pl<sub>i</sub> leading and of site index 18 or above) is about 1,200 ha/year, only a small portion of the total timber harvesting landbase.

With fertilisation, the annual harvest rate starting from decade 2 can be increased to 2,427,800 m<sup>3</sup>, which is 0.33% higher than in the base case (Figure 13).

**Figure 13.**



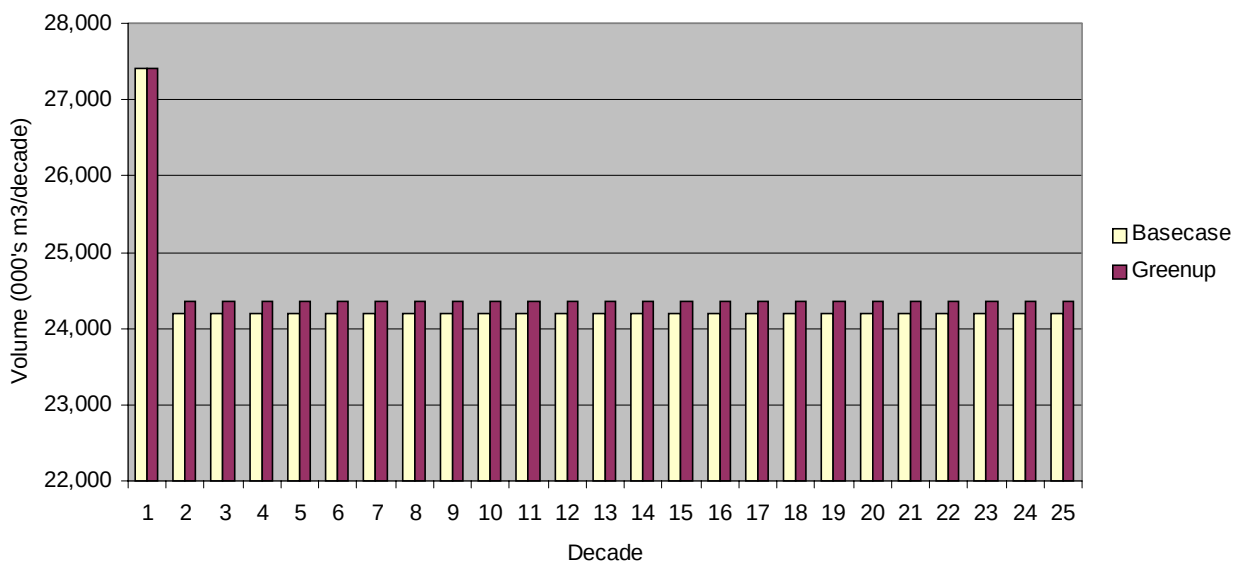
### 5.3.5.2 Green-up Age Reduction

Reduction in green-up age by 5 years can increase the sustainable harvest rate from decade 2 to 2,438,000/year, which is 0.62% above the base case (Figure 14).

Since FSSIM is a non-spatial model, the greenup requirement is modelled as a percentage limit of stands lower than the green-up height. This requirement is then applied to each landscape unit. With this non-spatial approach, the impacts of green-up requirements on harvest flow depend not only on the green-up age and the percentage limit, but also the relative age structure between landscape units. In landscape units where mature stands and young stands are not evenly distributed, the greenup requirement has a greater negative effect on the harvest flow than in a case where mature stands and young stands are more evenly distributed throughout the landscape unit.

The result of this scenario illustrates that the impact over the TSA is not particularly significant. However in specific landscape units with poor age class distribution, green-up requirements may have a very significant impact.

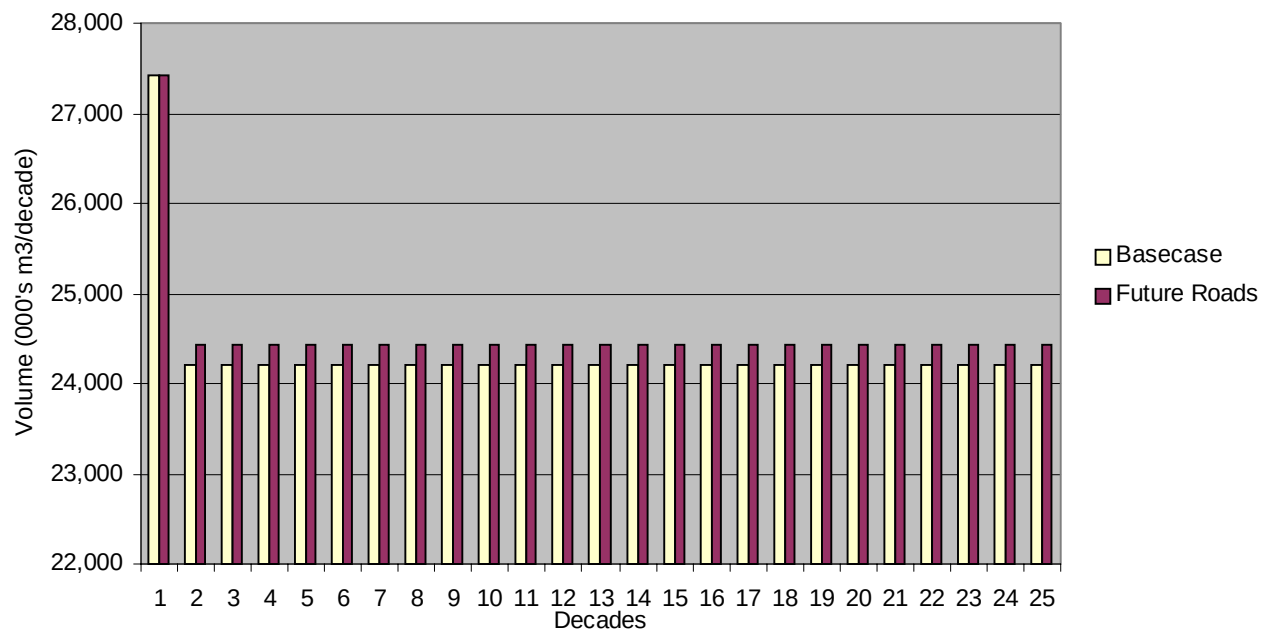
**Figure 14.**



### 5.3.5.3 Decrease in Future Roads Reduction

By lowering the future road reduction by 2%, the annual harvest rate can be increased to 2,442,800 m<sup>3</sup> from decade 2, which is 0.95% higher than in the base case (Figure 15).

**Figure 15**



#### **5.3.5.4 Acceleration of Backlog NSR elimination**

By eliminating backlog NSR immediately, the annual harvest flow from decade 2 can be increased by about 2,000 m<sup>3</sup>/year, approximately 0.1% above the base case. By eliminating the backlog NSR in 5 years, the increase on the harvest flow is less than 0.1%.

The total backlog NSR area in the main TSA is about 6,000 ha. Accelerating reforestation of this relatively small landbase by 5 or 10 years will have an insignificant impact on harvest flows over the TSA as a whole.

Due to the minimal impact of this scenario on the long term harvest flow, no graph has been provided.

#### **5.3.5.5 Alternative Spacing Densities**

Changing the spacing density from 1800 stem/ha to 2800 stem/ha or to 1200 stems/ha does not have a positive impact on the harvest flow. The volume growth curves under the three spacing densities are only slightly different. In most cases, spacing density 1800 stems/ha has slightly higher volume at culmination age than 2800 stems/ha or 1200 stems/ha.

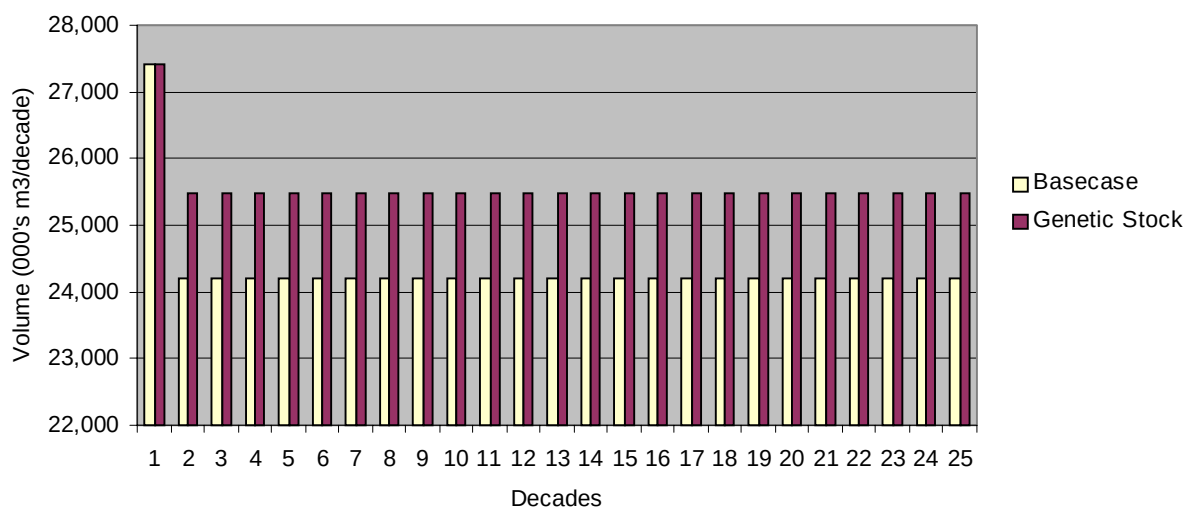
The spacing intensity under this scenario was the same as in the base case. The intensity varies between 0% to 40% among BEC zones and leading species. The average area treated is about 4,000 ha per year, which is consistent with programs conducted in the past.

### 5.3.5.6 Planting Genetically Improved Stock

By planting genetically improved stock, starting from decade 2 the annual harvest level can be increased by 5.25% above the base case (Figure 16).

In analysing this scenario, the site index was adjusted so that the managed stands could have a 12% volume gain at the culmination age. The green-up age and minimum harvest age were recalculated using the adjusted site index.

**Figure 16.**



#### **5.3.5.7 Partial Cutting and Commercial Thinning**

For the purpose of this analysis, a specific scenario assessing the impacts of implementing a commercial thinning program has not been conducted. The TISC analysis conducted in 1998 illustrated that the use of a commercial thinning program could significantly increase the volume of timber available for harvest. This result was largely a function of the fact that there was a significant short term fall down in wood supply. Commercial thinning activities were identified as a significant contributor to alleviating the perceived shortfall.

In this revised base case, the redefinition of the THLB has eliminated the shortfall and reduced the need to find alternate methods to access timber volume in the short term. As a result, if the objective is simply to provide additional volume, the implementation of an extensive partial cutting program is not required. However, it is believed that this type of harvest regime can play a significant role in meeting other objectives. Improving short term accessibility to timber in specific areas such as visually sensitive areas, wildlife management areas and areas constrained by the necessity to maintain old growth should be considered a priority. Implementing a more aggressive partial cutting program may provide greater harvest scheduling flexibility as well as ensure that other resource needs are met.

The option to utilise partial cutting regimes in ‘constrained areas’ should be assessed as a viable alternative to a ‘no harvest’ scenario. Most significantly, the 33 landscape units (Appendix 6) currently constrained by old growth requirements may in fact be accessible to a partial cutting program which ensures that old growth attributes are maintained within the stands that are harvested. In addition, partial cutting can play a valuable role in habitat enhancement (ie MDWR) and will significantly alleviate concerns in areas that are visually sensitive.

Partial cutting and commercial thinning harvest regimes must be recognised as valuable management tools which will not only provide access to timber volume, but may also help to enhance other resources and provide greater flexibility to forest managers.

## 5.4 Three Western Supply Blocks Results

The analysis conducted for the Three Western Supply Blocks has used the same methodology and management assumptions that were utilised in the Main TSA analysis, unless specifically noted. (The results for the ‘base case’ and scenario analysis are also presented in tabular format in Appendix 3)

### 5.4.1 Base case (WSB)

Figure 19 presents the harvest flow in the three Western Supply Blocks by decades. The harvest volume of decade 1 is composed of 766,000 m<sup>3</sup>/year for the first five years and 550,300 m<sup>3</sup>/year for the remaining 5 years. The harvest volume of 550,300/year can then be maintained to the end of the simulation. The harvest rate of the first five years in decade 1 includes 217,000 m<sup>3</sup>/year of mountain pine beetle salvage volume. Under this harvest rate, the growing stock remains relatively constant over time (Figure 18).

**Figure 17.**

#### Base Case Harvest Flow, Three Western Supply Blocks

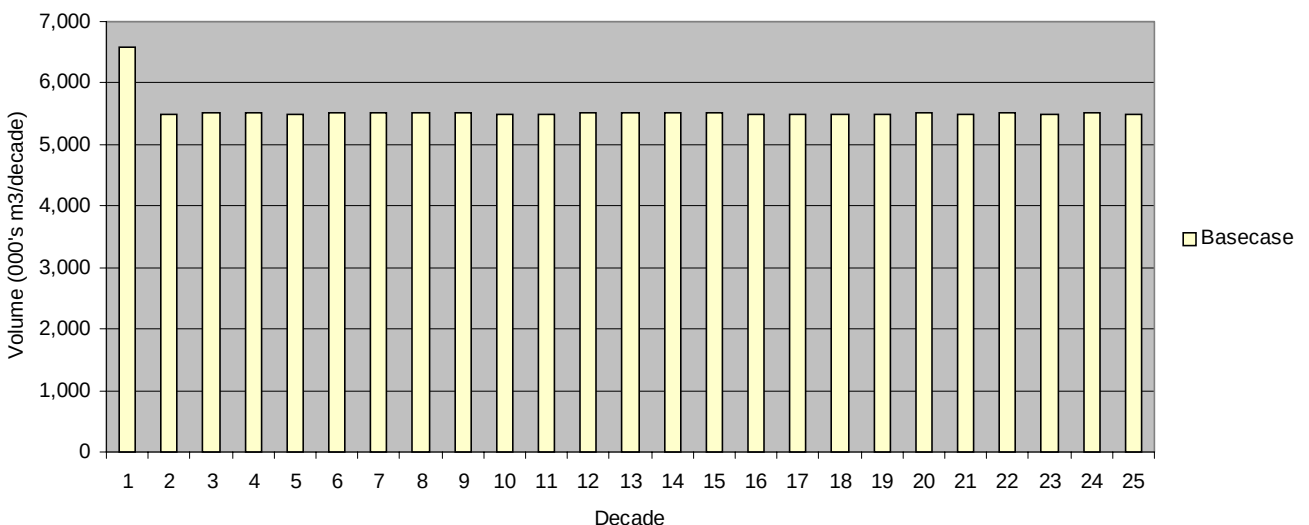
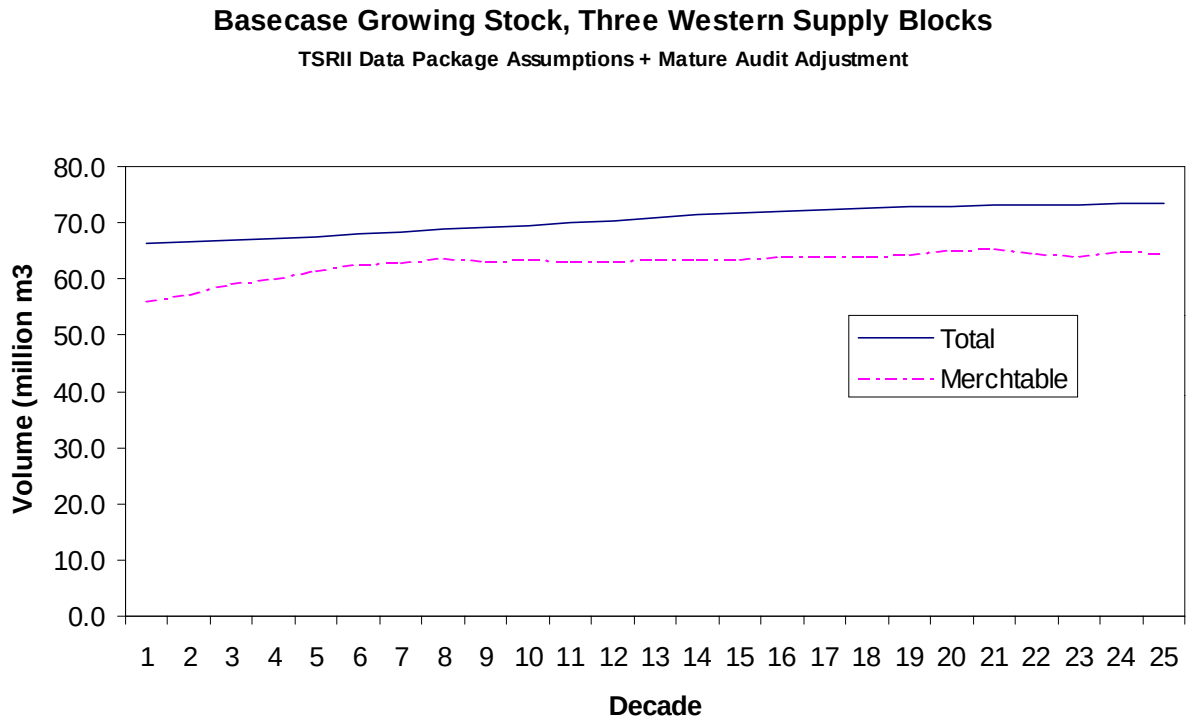


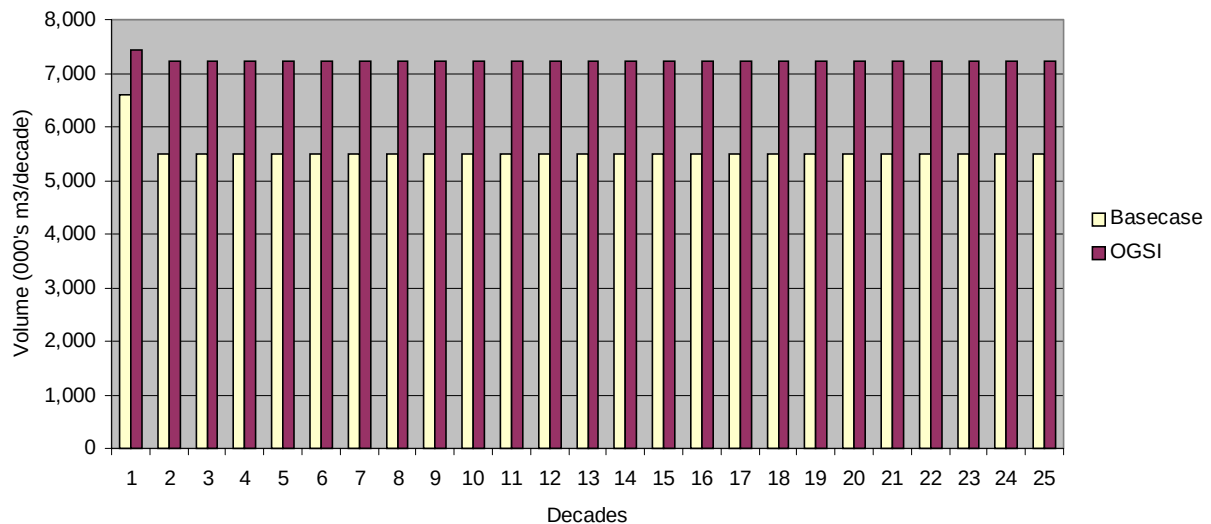
**Figure 18.**



### 5.4.2 Old Growth Site Index (OGSI) Adjustments (WSB)

After applying the OGSI adjustments, the harvest flow can be increased by 13.01% for decade 1 and 31.06% for decade 2 and thereafter (Figure 19).

**Figure 19.**

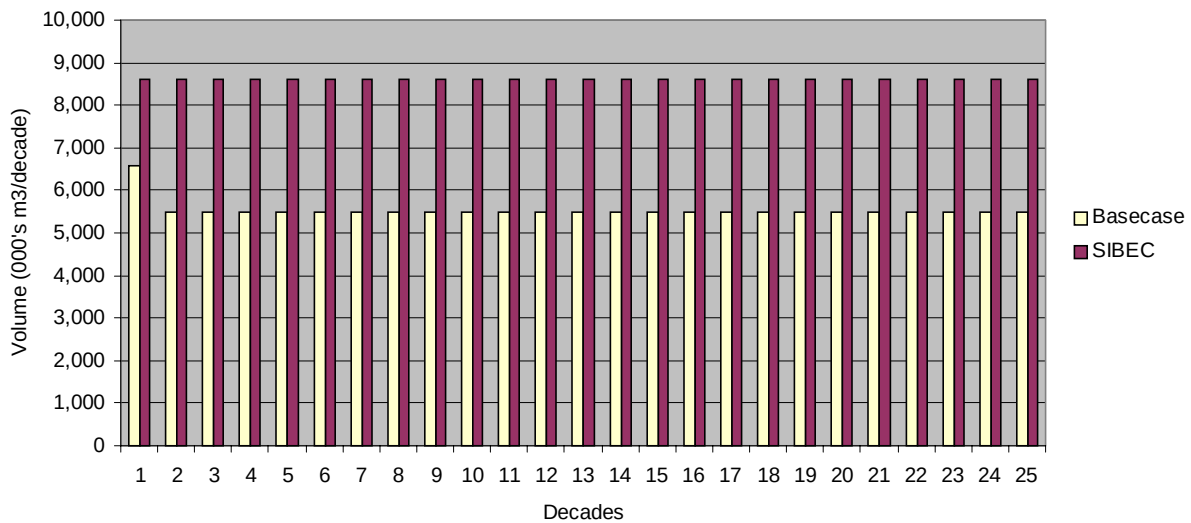


This scenario indicates that the OGSI adjustment increases the harvest flow in the three Western Supply Blocks by a greater percentage than in the Main TSA. The main reason for this is that the OGSI adjustment has a more significant impact on stands with lower site indices. For example, the OGSI adjustment would increase lodgepole pine stands of site index of 8 to site index 17.1 and lodgepole pine stands of site index 20 to site index 21.5. The Three Western Supply Blocks generally have lower inventory site indices than the Main TSA, resulting in a more dramatic impact to the harvest flow.

### 5.4.3 Application of SIBEC (WSB)

After application of the SIBEC, an even-flow harvest level of 859,200 m<sup>3</sup>/year can be maintained through the whole simulation horizon (Figure 20). The increase is 30.47% for decade 1 and 56.14% for decade 2 and beyond.

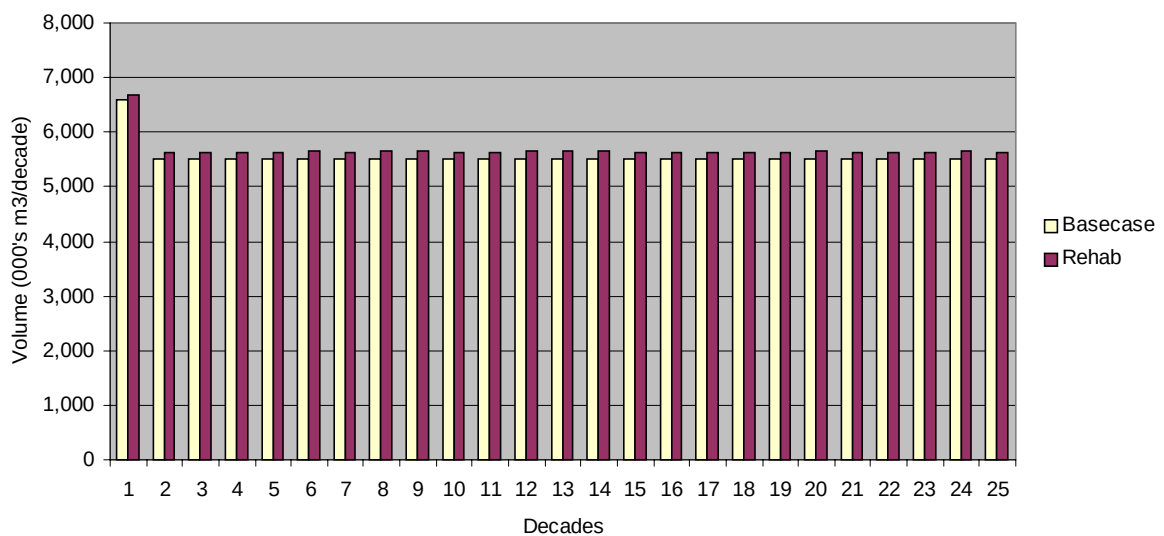
**Figure 20.**



#### 5.4.4 Rehabilitation of Repressed Pli Stands (WSB)

There are currently 87,000 ha in the Three Western Supply Blocks identified as ‘low sites’ and excluded from the THLB. After rehabilitating 20,000 hectares of these repressed lodgepole pine stands, the harvest flow can be increased by 1.28% for decade 1 and 2.49% for decade 2 and beyond (Figure 21).

**Figure 21.**



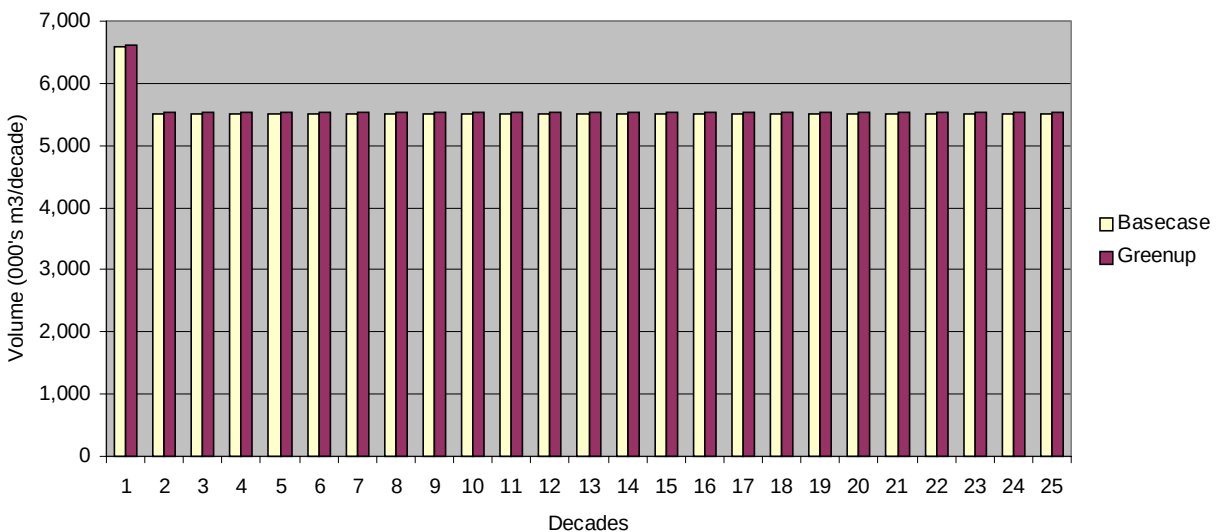
### 5.4.5 Silviculture Scenarios

In the three Western Supply Blocks, the same scenarios were tested with the exception of fertilisation, elimination of Backlog NSR and planting genetically improved stock. These were not analysed because, currently there is limited opportunity to implement these.

#### 5.4.5.1 Green-up age reduction by 5 years

Reduction in green-up age by 5 years can increase the harvest rate by 0.26% for decade 1 and 0.55% for decade 2 and beyond (Figure 22).

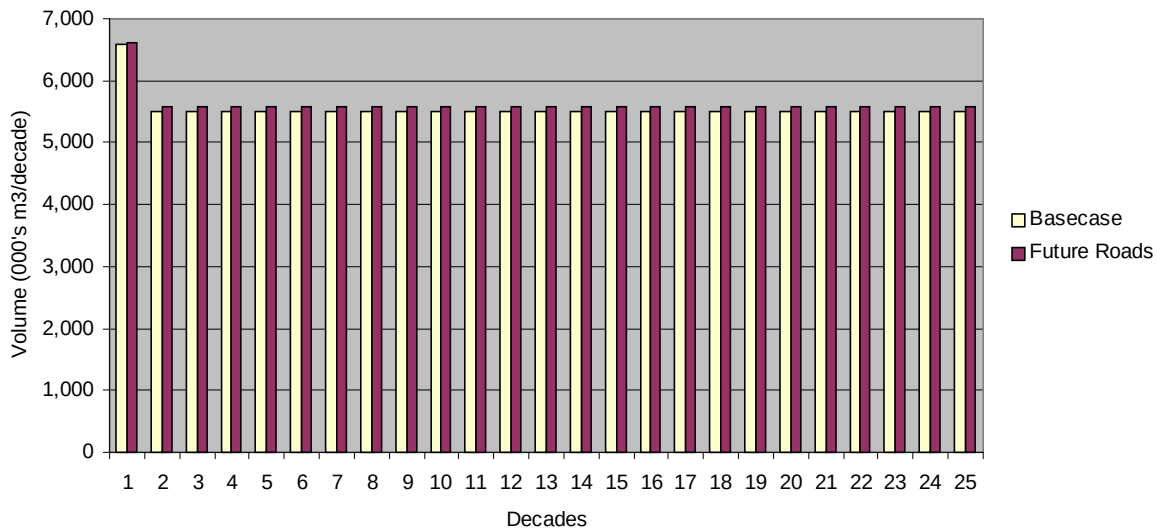
**Figure 22.**



### 5.4.5.2 Decrease in Future Roads Reduction

By lowering the future road reduction by 2%, the annual harvest rate can be increased by 0.56% in decade 1 and 1.27% for decade 2 and thereafter (Figure 23).

**Figure 23.**



### 5.4.5.3 Alternative Spacing Densities

Changing the spacing density from 1800 stem/ha to 2800 stem/ha or to 1200 stems/ha does not have positive impact on the harvest flow. The volume growth curves under the three different spacing densities are only slightly different. In most cases, spacing density 1800 stems/ha has slightly higher volume at culmination age than 2800 stems/ha and 1200 stems/ha.

## 6 INCREMENTAL SILVICULTURE

### 6.1 History

In the Williams Lake TSA, the primary incremental treatment has been juvenile spacing, and on a smaller scale, fertilisation and pruning. Commercial thinning has also been conducted on a limited scale in the Horsefly Forest District. Historically, incremental treatments have been conducted in a small portion of the TSA and have been limited by long travel distances and limited availability of resources.

The following table provides a summary of incremental silviculture treatments conducted to date in the Williams Lake TSA.

**Table 2. Incremental Silviculture Treatments**

| <b>TREATMENT</b>        | <b>DISTRICT</b>              |                         |                          |
|-------------------------|------------------------------|-------------------------|--------------------------|
|                         | (ha)<br><b>Williams Lake</b> | (ha)<br><b>Horsefly</b> | (ha)<br><b>Chilcotin</b> |
| <b>Juvenile Spacing</b> | 50401                        | 8778                    | 45551                    |
| <b>Fertilisation</b>    | 950                          | 5394                    | 173                      |
| <b>Pruning</b>          | 134                          | 575                     | 4                        |
| <b>TOTAL</b>            | <b>51485</b>                 | <b>14747</b>            | <b>45728</b>             |

Data Source: ISIS  
(March, 2000).

**Figure 24. Treatment Trends in the Williams Lake TSA**

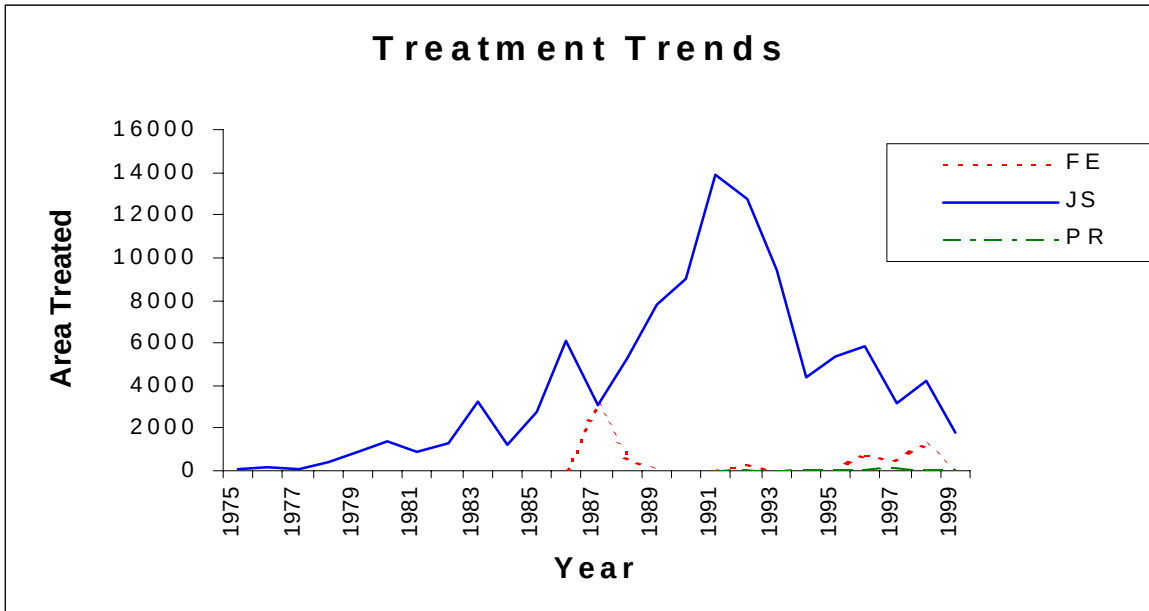
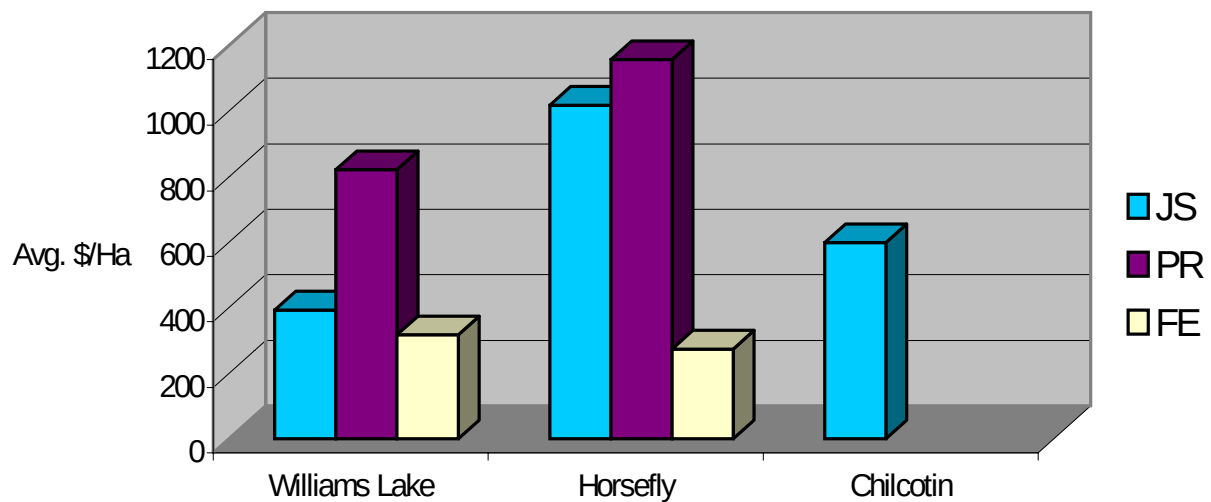


**Figure 25. Average Treatment Costs**



## **6.2 Strategic Silviculture Priorities**

The results of this analysis have clearly illustrated that site productivity plays a significant role in the development of harvest flow projections. Updating site index estimates to reflect newer, more refined data can have a very large positive impact on the long term volume projections. To fully understand the harvest flow in this TSA it will be imperative to complete the ongoing work in defining the OGSi adjustments as well as the SIBEC or Site Index Adjustments. Ensuring that site productivity estimates are accurate and representative of the stands within this TSA will help identify a secure long term timber supply.

In addition to continuing site productivity work, an incremental program for this TSA should focus in the following during the next five years:

- Closely assess biodiversity issues in constrained landscape units (Appendix 6) and examine the potential for commercial thinning programs and partial cutting regimes to provide access to timber while maintaining biodiversity objectives. Preparatory juvenile spacing may be required in many of these areas to fully facilitate future commercial thinning.
- Target the rehabilitation of repressed Pli stands. This type of work will immediately increase the THLB and also increase site index estimates as well, contributing to an overall increase in harvest flow.
- Juvenile spacing activities should be implemented with the intention of addressing values such as biodiversity, wildlife habitat, enhancing wood quality and facilitating the more efficient implementation of partial cutting. Although this analysis has shown that juvenile spacing at current levels does not contribute to an increase in harvest flow, a well focused program can enable the maintenance of site productivity as well as contribute to the enhancement of other values.

- The use of genetically improved stock should be maximised wherever possible. The 5% increase in harvest flow as a result of these practices, illustrates a need to continue to improve the viability of genetically improved stock types and ensure that it is available for future use.

The following summary illustrates general cost estimates for implementing the incremental treatments detailed in the analysis results:

| <b>Treatment</b>                 | <b>Proposed Ha/yr</b> | <b>Estimated \$/ha</b> | <b>Total \$/year</b> | <b>Five year Total Cost</b> |
|----------------------------------|-----------------------|------------------------|----------------------|-----------------------------|
| Plant Genetically Improved stock | 2000                  | 40                     | 80000                | 400,000                     |
| Backlog NSR                      | 1000                  | 1000                   | 1,000,000            | 5,000,000                   |
| Juvenile Spacing                 | 6000                  | 550                    | 3,300,000            | 16,500,000                  |
| Pli Rehabilitation               | 10000*                | 1250                   | 12,500,000           | 62,500,000                  |
| Fertilisation                    | 1200                  | 295                    | 354,000              | 1,770,000                   |
| <b>TOTAL</b>                     |                       |                        | <b>17,234,000</b>    | <b>86,170,000</b>           |

\* Although silviculturally ‘suitable’ and available for treatment, this level of activity may not be operationally achievable.

Clearly, the gains achievable through the use of improved stock types provide maximum benefit, since the relative cost of treatment is much lower than other treatment regimes. Increased growth rates will also help alleviate greenup constraints which is a further benefit in mitigating short term access to timber concerns.

Due to the nature of the CCLUP and the requirement to meet established timber ‘targets’, the impacts of various treatment regimes must be further assessed on a more localised CCLUP subzone and landscape unit level.

## **7 SUMMARY AND RECOMMENDATIONS**

The analyses conducted for this project illustrates that several key issues have a significant impact on the timber availability in the Williams Lake TSA:

1. Ensuring that the THLB is accurately defined, in terms of current management and current opportunity, will help to provide realistic estimates and define where harvesting operations will be focused.
2. Site productivity levels must be closely assessed and current OGSi and SIBEC initiatives must be completed. The results should be incorporated into any subsequent timber supply analysis. Realistic site productivity estimates will aid in confirming realistic, long term sustainable harvest levels.
3. The opportunity for improving ‘access to timber’ in constrained landscape units must be assessed more closely. Specific opportunities include:
  - Strategies to minimise greenup (i.e.: fertilisation, genetically improved stock) will help alleviate adjacency constraints in landscape units with poor age distribution.
  - Continued use of genetically improved stock will help ensure the maintenance of a long term, even flow harvest.
  - Rehabilitation of repressed pine sites will effectively increase growth potential and provide access to a larger timber harvesting landbase in the long term.
  - Introduction of a viable commercial thinning and partial cutting program may provide access into constrained landscape units not available for conventional harvest.

- Treatments such as juvenile spacing and commercial thinning may provide enhancement to timber productivity as well as other resource uses

On a broad TSA basis, an even flow harvest level can be maintained in the long term. However, there are significant challenges to overcome to ensure that CCLUP objectives are met while still maintaining the harvest flow in the long as well as short term. Future planning initiatives must consider issues not only at a TSA level, but also on a more specific landscape unit level which will meet the requirements defined by the CCLUP. More extensive analysis to address a variety of enhancement issues as they relate to the CCLUP is being initiated in 2000 by a restructured Regional Timber Investment Strategy Committee. The mandate of this committee will be to more closely assess the impacts of operating to meet the specific objectives identified in the CCLUP.

## **APPENDIX 1**

### **Treatment Summary Tables**

**TREATMENT SUMMARY TABLE**

| MAIN TSA | Regime                            | Objective                                                   | Target Stand Description             | Response TimeFrame | Timber Supply Impacts       |                | Impacts to Other Land Uses? |          |         | Estimated Treatment Area    | Estimated Cost/ha | Estimated Job Outcome (person-days/ha) |
|----------|-----------------------------------|-------------------------------------------------------------|--------------------------------------|--------------------|-----------------------------|----------------|-----------------------------|----------|---------|-----------------------------|-------------------|----------------------------------------|
|          |                                   |                                                             |                                      |                    | Vol. Increase (000's m3/yr) | % Vol increase | OG                          | Wildlife | Visuals |                             |                   |                                        |
|          | OGSI Adjustment                   | Accurately Define site productivity                         | Pli, Sx >140 ICH,ESSF, MS,SBS        | Short - Mid Long   | 321                         | 13.3           | Y                           | N        | N       | n/a                         |                   |                                        |
|          | SIBEC Adjustment                  | Accurately Define site productivity                         | All sites: assumed site series 1.    | Short - Mid Long   | 641                         | 26.5           | Y                           | N        | N       | n/a                         |                   |                                        |
|          | Pli Rehab                         | Increase THLB, increase site productivity                   | Repressed Pli SI <7                  | Mid - Long         | 35                          | 1.45           | N                           | N        | N       | 10,000 ha (available area)* | 1250              | 5                                      |
|          | Fertilisation                     | Increase site productivity, reduce rotation                 | Pli, SI >18                          | Mid - Long         | 8.8                         | 0.33           | N                           | N        | Y       | 1200 ha/yr                  | 295               | 1                                      |
|          | Plant Genetically Improved Stock  | Reduce rotation length, reduce greenup age                  | All planted sites 12% volume gain    | Mid - Long         | 127                         | 5.25           |                             |          |         | 2000 ha/yr                  | 40                | n/a                                    |
|          | Greenup Age Reduction             | alleviate adjacency, reduce rotation                        | all managed stands, reduce by 5 yrs. | Short - Mid        | 19                          | 0.62           | Y                           | N        | Y       | n/a                         |                   | n/a                                    |
|          | Decrease Future Roads             | Increase THLB                                               |                                      | Short              | 23                          | 0.95           | N                           | N        | N       | reduce area by 2%           |                   | n/a                                    |
|          | Backlog NSR                       | Alleviate adjacency, increase productivity                  | all backlog NSR sites                | Mid- Long          | 2                           | 0.10           | N                           | N        | N       | 1000 ha/yr                  | 1000              | 1.5                                    |
|          | Juvenile Spacing                  | Increase productivity, prep for CT/PC                       | % of AU as per Base Case 12-1800 sph | Mid - Long         | 0                           | 0              | N                           | N        | N       | 6000 ha/yr                  | 550               | 4.5                                    |
|          | Partial Cutting/ Commercial Thin. | Alleviate adjacency, biodiversity issues and habitat supply | various                              | Short - Mid - Long | Not Tested                  | Not Tested     | Y                           | Y        | Y       | further assessment required |                   | 2.5                                    |

**TREATMENT SUMMARY TABLE**

| 3 WSB's               |                                           |                                                    |                    | Timber Supply Impacts    |                | Impacts to Other Land Uses? |          |         |                          |                   |                       |
|-----------------------|-------------------------------------------|----------------------------------------------------|--------------------|--------------------------|----------------|-----------------------------|----------|---------|--------------------------|-------------------|-----------------------|
| Regime                | Objective                                 | Target Stand Description                           | Response TimeFrame | Vol. Increase (000's m3) | % Vol increase | OG                          | Wildlife | Visuals | Estimated Treatment Area | Estimated Cost/ha | Estimated Job Outcome |
| OGSI Adjustment       | Accurately define site productivity       | Pli, Sx >140 ICH,ESSF, MS,SBS                      | Short - Mid Long   | 170                      | 31             | Y                           | N        | N       | n/a                      |                   |                       |
| SIBEC Adjustment      | Accurately define Site productivity       | All sites: assumed site series 1.                  | Short - Mid Long   | 309                      | 56             | Y                           | N        | N       | n/a                      |                   |                       |
| Pli Rehab             | Increase THLB, increase site productivity | Repressed Pli SI <7                                | Mid - Long         | 137                      | 2.5            | N                           | N        | N       | 20,000 (available area)* | 1250              | 5                     |
| Greenup Age Reduction | alleviate adjacency, reduce rotation      | all managed stands, reduce by 5 yrs                | Short - Mid        | 3                        | 0.55           | Y                           | N        | Y       | n/a                      | n/a               | n/a                   |
| Decrease Future Roads | Increase THLB                             |                                                    | Short              | 7.2                      | 1.3            | N                           | N        | N       | n/a                      | n/a               | n/a                   |
| Juvenile Spacing      | Increase productivity,                    | % of AU, as per base case, target 1200 - 1800 sph. | Mid-Long           | 0                        | 0              | N                           | N        | N       | 2000 (available area)*   | 600               | 4.5                   |

\*Although this area is silviculturally suitable for treatment, economic feasibility to complete this level of treatment in the 3 WSB's may be limited.

## **APPENDIX 2**

### **Main TSA Harvest Flows**

#### **Tabular Summaries**

OGSI Harvest Flow  
Main TSA

| Harvest flow, Basecase vs Basecase + OGSI |                          |          |                 |        |
|-------------------------------------------|--------------------------|----------|-----------------|--------|
| Decade                                    | Volume (000's m3/Decade) |          | Increase/Decade |        |
|                                           | OGSI                     | Basecase | 000's m3        | %      |
| 1                                         | 27,923                   | 27,413   | 510             | 1.86%  |
| 2                                         | 27,408                   | 24,198   | 3,210           | 13.27% |
| 3                                         | 27,409                   | 24,199   | 3,210           | 13.26% |
| 4                                         | 27,409                   | 24,199   | 3,210           | 13.26% |
| 5                                         | 27,408                   | 24,199   | 3,210           | 13.26% |
| 6                                         | 27,408                   | 24,198   | 3,209           | 13.26% |
| 7                                         | 27,409                   | 24,198   | 3,211           | 13.27% |
| 8                                         | 27,409                   | 24,199   | 3,210           | 13.26% |
| 9                                         | 27,408                   | 24,199   | 3,210           | 13.26% |
| 10                                        | 27,409                   | 24,199   | 3,210           | 13.27% |
| 11                                        | 27,408                   | 24,200   | 3,209           | 13.26% |
| 12                                        | 27,408                   | 24,199   | 3,209           | 13.26% |
| 13                                        | 27,408                   | 24,199   | 3,209           | 13.26% |
| 14                                        | 27,408                   | 24,199   | 3,209           | 13.26% |
| 15                                        | 27,408                   | 24,199   | 3,209           | 13.26% |
| 16                                        | 27,409                   | 24,198   | 3,211           | 13.27% |
| 17                                        | 27,408                   | 24,198   | 3,210           | 13.27% |
| 18                                        | 27,409                   | 24,198   | 3,211           | 13.27% |
| 19                                        | 27,408                   | 24,199   | 3,210           | 13.26% |
| 20                                        | 27,408                   | 24,199   | 3,209           | 13.26% |
| 21                                        | 27,407                   | 24,199   | 3,208           | 13.26% |
| 22                                        | 27,408                   | 24,199   | 3,209           | 13.26% |
| 23                                        | 27,408                   | 24,199   | 3,210           | 13.26% |
| 24                                        | 27,409                   | 24,199   | 3,210           | 13.27% |
| 25                                        | 27,409                   | 24,198   | 3,210           | 13.27% |

SIBEC Harvest Flow  
Main TSA

| Harvest flow, Basecase vs Basecase + SIBEC |                          |          |                 |        |
|--------------------------------------------|--------------------------|----------|-----------------|--------|
| Decade                                     | Volume (000's m3/Decade) |          | Increase/Decade |        |
|                                            | SIBEC                    | Basecase | 000's m3        | %      |
| 1                                          | 30,608                   | 27,413   | 3,195           | 11.65% |
| 2                                          | 30,608                   | 24,198   | 6,410           | 26.49% |
| 3                                          | 30,609                   | 24,199   | 6,409           | 26.49% |
| 4                                          | 30,608                   | 24,199   | 6,410           | 26.49% |
| 5                                          | 30,608                   | 24,199   | 6,409           | 26.49% |
| 6                                          | 30,609                   | 24,198   | 6,410           | 26.49% |
| 7                                          | 30,609                   | 24,198   | 6,411           | 26.49% |
| 8                                          | 30,609                   | 24,199   | 6,410           | 26.49% |
| 9                                          | 30,608                   | 24,199   | 6,409           | 26.48% |
| 10                                         | 30,608                   | 24,199   | 6,410           | 26.49% |
| 11                                         | 30,608                   | 24,200   | 6,408           | 26.48% |
| 12                                         | 30,608                   | 24,199   | 6,409           | 26.48% |
| 13                                         | 30,609                   | 24,199   | 6,410           | 26.49% |
| 14                                         | 30,608                   | 24,199   | 6,409           | 26.48% |
| 15                                         | 30,608                   | 24,199   | 6,409           | 26.49% |
| 16                                         | 30,609                   | 24,198   | 6,411           | 26.49% |
| 17                                         | 30,609                   | 24,198   | 6,411           | 26.49% |
| 18                                         | 30,608                   | 24,198   | 6,410           | 26.49% |
| 19                                         | 30,608                   | 24,199   | 6,409           | 26.49% |
| 20                                         | 30,609                   | 24,199   | 6,410           | 26.49% |
| 21                                         | 30,607                   | 24,199   | 6,408           | 26.48% |
| 22                                         | 30,608                   | 24,199   | 6,410           | 26.49% |
| 23                                         | 30,607                   | 24,199   | 6,409           | 26.48% |
| 24                                         | 30,609                   | 24,199   | 6,411           | 26.49% |
| 25                                         | 30,608                   | 24,198   | 6,410           | 26.49% |

Rehabilitation Harvest  
Flow  
Main TSA

| Harvest flow, Basecase vs Basecase + Rehab |                          |          |                 |       |
|--------------------------------------------|--------------------------|----------|-----------------|-------|
| Decade                                     | Volume (000's m3/Decade) |          | Increase/Decade | %     |
|                                            | Rehab                    | Basecase | 000's m3        |       |
| 1                                          | 27,413                   | 27,413   | 0               | 0.00% |
| 2                                          | 24,548                   | 24,198   | 350             | 1.45% |
| 3                                          | 24,549                   | 24,199   | 350             | 1.45% |
| 4                                          | 24,549                   | 24,199   | 350             | 1.45% |
| 5                                          | 24,549                   | 24,199   | 350             | 1.45% |
| 6                                          | 24,548                   | 24,198   | 350             | 1.45% |
| 7                                          | 24,548                   | 24,198   | 350             | 1.45% |
| 8                                          | 24,549                   | 24,199   | 350             | 1.45% |
| 9                                          | 24,549                   | 24,199   | 350             | 1.45% |
| 10                                         | 24,548                   | 24,199   | 349             | 1.44% |
| 11                                         | 24,550                   | 24,200   | 350             | 1.45% |
| 12                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 13                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 14                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 15                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 16                                         | 24,549                   | 24,198   | 350             | 1.45% |
| 17                                         | 24,548                   | 24,198   | 350             | 1.45% |
| 18                                         | 24,549                   | 24,198   | 351             | 1.45% |
| 19                                         | 24,548                   | 24,199   | 349             | 1.44% |
| 20                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 21                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 22                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 23                                         | 24,548                   | 24,199   | 349             | 1.44% |
| 24                                         | 24,549                   | 24,199   | 350             | 1.45% |
| 25                                         | 24,548                   | 24,198   | 350             | 1.45% |

Fertilization Harvest  
Flow  
Main TSA

| Harvest flow, Basecase vs Basecase + Ferti |                          |          |                 |       |
|--------------------------------------------|--------------------------|----------|-----------------|-------|
| Decade                                     | Volume (000's m3/Decade) |          | Increase/Decade | %     |
|                                            | Fertilization            | Basecase | 000's m3        |       |
| 1                                          | 27,413                   | 27,413   | 0               | 0.00% |
| 2                                          | 24,278                   | 24,198   | 80              | 0.33% |
| 3                                          | 24,279                   | 24,199   | 80              | 0.33% |
| 4                                          | 24,279                   | 24,199   | 80              | 0.33% |
| 5                                          | 24,279                   | 24,199   | 80              | 0.33% |
| 6                                          | 24,278                   | 24,198   | 80              | 0.33% |
| 7                                          | 24,278                   | 24,198   | 80              | 0.33% |
| 8                                          | 24,279                   | 24,199   | 80              | 0.33% |
| 9                                          | 24,279                   | 24,199   | 80              | 0.33% |
| 10                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 11                                         | 24,280                   | 24,200   | 80              | 0.33% |
| 12                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 13                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 14                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 15                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 16                                         | 24,278                   | 24,198   | 80              | 0.33% |
| 17                                         | 24,278                   | 24,198   | 80              | 0.33% |
| 18                                         | 24,278                   | 24,198   | 80              | 0.33% |
| 19                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 20                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 21                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 22                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 23                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 24                                         | 24,279                   | 24,199   | 80              | 0.33% |
| 25                                         | 24,278                   | 24,198   | 80              | 0.33% |

Reduced Greenup  
Harvest Flow  
Main TSA

| Harvest flow, Basecase vs Basecase + greenup |                          |          |                 |       |
|----------------------------------------------|--------------------------|----------|-----------------|-------|
| Decade                                       | Volume (000's m3/Decade) |          | Increase/Decade |       |
|                                              | Greenup                  | Basecase | 000's m3        | %     |
| 1                                            | 27,413                   | 27,413   | 0               | 0.00% |
| 2                                            | 24,349                   | 24,198   | 150             | 0.62% |
| 3                                            | 24,349                   | 24,199   | 150             | 0.62% |
| 4                                            | 24,349                   | 24,199   | 150             | 0.62% |
| 5                                            | 24,349                   | 24,199   | 150             | 0.62% |
| 6                                            | 24,349                   | 24,198   | 150             | 0.62% |
| 7                                            | 24,348                   | 24,198   | 150             | 0.62% |
| 8                                            | 24,349                   | 24,199   | 150             | 0.62% |
| 9                                            | 24,349                   | 24,199   | 150             | 0.62% |
| 10                                           | 24,348                   | 24,199   | 150             | 0.62% |
| 11                                           | 24,349                   | 24,200   | 150             | 0.62% |
| 12                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 13                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 14                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 15                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 16                                           | 24,349                   | 24,198   | 150             | 0.62% |
| 17                                           | 24,348                   | 24,198   | 150             | 0.62% |
| 18                                           | 24,350                   | 24,198   | 151             | 0.63% |
| 19                                           | 24,347                   | 24,199   | 149             | 0.62% |
| 20                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 21                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 22                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 23                                           | 24,348                   | 24,199   | 150             | 0.62% |
| 24                                           | 24,349                   | 24,199   | 150             | 0.62% |
| 25                                           | 24,348                   | 24,198   | 150             | 0.62% |

Future Roads  
Reduction  
Harvest Flow  
Main TSA

| Harvest flow, Basecase vs Basecase + Future Roads |                          |          |                 |       |
|---------------------------------------------------|--------------------------|----------|-----------------|-------|
| Decade                                            | Volume (000's m3/Decade) |          | Increase/Decade |       |
|                                                   | Fu_roads                 | Basecase | 000's m3        | %     |
| 1                                                 | 27,413                   | 27,413   | 0               | 0.00% |
| 2                                                 | 24,428                   | 24,198   | 230             | 0.95% |
| 3                                                 | 24,429                   | 24,199   | 230             | 0.95% |
| 4                                                 | 24,429                   | 24,199   | 230             | 0.95% |
| 5                                                 | 24,429                   | 24,199   | 230             | 0.95% |
| 6                                                 | 24,428                   | 24,198   | 230             | 0.95% |
| 7                                                 | 24,428                   | 24,198   | 230             | 0.95% |
| 8                                                 | 24,429                   | 24,199   | 230             | 0.95% |
| 9                                                 | 24,429                   | 24,199   | 230             | 0.95% |
| 10                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 11                                                | 24,429                   | 24,200   | 230             | 0.95% |
| 12                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 13                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 14                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 15                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 16                                                | 24,428                   | 24,198   | 230             | 0.95% |
| 17                                                | 24,428                   | 24,198   | 230             | 0.95% |
| 18                                                | 24,428                   | 24,198   | 230             | 0.95% |
| 19                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 20                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 21                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 22                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 23                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 24                                                | 24,429                   | 24,199   | 230             | 0.95% |
| 25                                                | 24,428                   | 24,198   | 230             | 0.95% |

Use of Genetically Improved Stock

| Harvest flow, Basecase vs Basecase + Genetically Improved Stock |                          |          |                 |       |
|-----------------------------------------------------------------|--------------------------|----------|-----------------|-------|
| Decade                                                          | Volume (000's m³/Decade) |          | Increase/Decade |       |
|                                                                 | Genetic                  | Basecase | 000's m³        | %     |
| 1                                                               | 27,413                   | 27,413   | 0               | 0.00% |
| 2                                                               | 25,468                   | 24,198   | 1,270           | 5.25% |
| 3                                                               | 25,469                   | 24,199   | 1,270           | 5.25% |
| 4                                                               | 25,469                   | 24,199   | 1,270           | 5.25% |
| 5                                                               | 25,468                   | 24,199   | 1,270           | 5.25% |
| 6                                                               | 25,468                   | 24,198   | 1,270           | 5.25% |
| 7                                                               | 25,468                   | 24,198   | 1,270           | 5.25% |
| 8                                                               | 25,470                   | 24,199   | 1,270           | 5.25% |
| 9                                                               | 25,469                   | 24,199   | 1,270           | 5.25% |
| 10                                                              | 25,468                   | 24,199   | 1,270           | 5.25% |
| 11                                                              | 25,469                   | 24,200   | 1,270           | 5.25% |
| 12                                                              | 25,469                   | 24,199   | 1,270           | 5.25% |
| 13                                                              | 25,468                   | 24,199   | 1,269           | 5.25% |
| 14                                                              | 25,469                   | 24,199   | 1,270           | 5.25% |
| 15                                                              | 25,468                   | 24,199   | 1,269           | 5.24% |
| 16                                                              | 25,469                   | 24,198   | 1,270           | 5.25% |
| 17                                                              | 25,468                   | 24,198   | 1,270           | 5.25% |
| 18                                                              | 25,468                   | 24,198   | 1,270           | 5.25% |
| 19                                                              | 25,469                   | 24,199   | 1,270           | 5.25% |
| 20                                                              | 25,469                   | 24,199   | 1,270           | 5.25% |
| 21                                                              | 25,468                   | 24,199   | 1,269           | 5.24% |
| 22                                                              | 25,469                   | 24,199   | 1,270           | 5.25% |
| 23                                                              | 25,468                   | 24,199   | 1,270           | 5.25% |
| 24                                                              | 25,468                   | 24,199   | 1,270           | 5.25% |
| 25                                                              | 25,469                   | 24,198   | 1,271           | 5.25% |

## **APPENDIX 3**

### **Western Supply Blocks Harvest Flows**

#### **Tabular Summaries**

OGSI Harvest Flow  
Western Supply  
Blocks

| WSBS                                      |                          |          |                 |        |
|-------------------------------------------|--------------------------|----------|-----------------|--------|
| Harvest flow, Basecase vs Basecase + OGSI |                          |          |                 |        |
| Decade                                    | Volume (000's m3/Decade) |          | Increase/Decade |        |
|                                           | OGSI                     | Basecase | 000's m3        | %      |
| 1                                         | 7,443                    | 6,586    | 857             | 13.01% |
| 2                                         | 7,213                    | 5,503    | 1,709           | 31.06% |
| 3                                         | 7,213                    | 5,504    | 1,709           | 31.06% |
| 4                                         | 7,213                    | 5,504    | 1,710           | 31.06% |
| 5                                         | 7,214                    | 5,503    | 1,711           | 31.09% |
| 6                                         | 7,214                    | 5,505    | 1,709           | 31.05% |
| 7                                         | 7,214                    | 5,504    | 1,710           | 31.07% |
| 8                                         | 7,212                    | 5,504    | 1,708           | 31.02% |
| 9                                         | 7,213                    | 5,504    | 1,709           | 31.05% |
| 10                                        | 7,214                    | 5,503    | 1,710           | 31.07% |
| 11                                        | 7,214                    | 5,502    | 1,712           | 31.11% |
| 12                                        | 7,213                    | 5,504    | 1,709           | 31.05% |
| 13                                        | 7,214                    | 5,504    | 1,709           | 31.06% |
| 14                                        | 7,214                    | 5,505    | 1,709           | 31.05% |
| 15                                        | 7,213                    | 5,504    | 1,709           | 31.06% |
| 16                                        | 7,214                    | 5,503    | 1,711           | 31.08% |
| 17                                        | 7,213                    | 5,503    | 1,710           | 31.08% |
| 18                                        | 7,214                    | 5,503    | 1,710           | 31.08% |
| 19                                        | 7,214                    | 5,504    | 1,710           | 31.07% |
| 20                                        | 7,213                    | 5,504    | 1,709           | 31.05% |
| 21                                        | 7,213                    | 5,503    | 1,710           | 31.07% |
| 22                                        | 7,214                    | 5,504    | 1,710           | 31.07% |
| 23                                        | 7,214                    | 5,504    | 1,710           | 31.08% |
| 24                                        | 7,213                    | 5,504    | 1,709           | 31.05% |
| 25                                        | 7,213                    | 5,504    | 1,710           | 31.07% |

SIBEC Harvest Flow  
Western Supply  
Blocks

| WSBS                                       |                          |          |                 |        |
|--------------------------------------------|--------------------------|----------|-----------------|--------|
| Harvest flow, Basecase vs Basecase + SIBEC |                          |          |                 |        |
| Decade                                     | Volume (000's m3/Decade) |          | Increase/Decade |        |
|                                            | SIBEC                    | Basecase | 000's m3        | %      |
| 1                                          | 8,592                    | 6,586    | 2,006           | 30.47% |
| 2                                          | 8,593                    | 5,503    | 3,090           | 56.14% |
| 3                                          | 8,593                    | 5,504    | 3,089           | 56.12% |
| 4                                          | 8,594                    | 5,504    | 3,090           | 56.14% |
| 5                                          | 8,594                    | 5,503    | 3,090           | 56.15% |
| 6                                          | 8,593                    | 5,505    | 3,089           | 56.11% |
| 7                                          | 8,593                    | 5,504    | 3,090           | 56.13% |
| 8                                          | 8,593                    | 5,504    | 3,089           | 56.11% |
| 9                                          | 8,594                    | 5,504    | 3,089           | 56.12% |
| 10                                         | 8,594                    | 5,503    | 3,090           | 56.15% |
| 11                                         | 8,592                    | 5,502    | 3,090           | 56.17% |
| 12                                         | 8,595                    | 5,504    | 3,091           | 56.15% |
| 13                                         | 8,593                    | 5,504    | 3,089           | 56.12% |
| 14                                         | 8,594                    | 5,505    | 3,089           | 56.13% |
| 15                                         | 8,592                    | 5,504    | 3,088           | 56.11% |
| 16                                         | 8,595                    | 5,503    | 3,091           | 56.17% |
| 17                                         | 8,593                    | 5,503    | 3,090           | 56.15% |
| 18                                         | 8,594                    | 5,503    | 3,091           | 56.17% |
| 19                                         | 8,592                    | 5,504    | 3,088           | 56.12% |
| 20                                         | 8,592                    | 5,504    | 3,088           | 56.11% |
| 21                                         | 8,595                    | 5,503    | 3,092           | 56.19% |
| 22                                         | 8,595                    | 5,504    | 3,091           | 56.16% |
| 23                                         | 8,593                    | 5,504    | 3,089           | 56.13% |
| 24                                         | 8,592                    | 5,504    | 3,088           | 56.10% |
| 25                                         | 8,595                    | 5,504    | 3,091           | 56.16% |

Rehabilitation Harvest  
Flow  
Western Supply  
Blocks

| WSBS                         |                          |          |                 |       |
|------------------------------|--------------------------|----------|-----------------|-------|
| Basecase vs Basecase + Rehab |                          |          |                 |       |
| Decade                       | Volume (000's m3/Decade) |          | Increase/Decade |       |
|                              | Rehab                    | Basecase | 000's m3        | %     |
| 1                            | 6,670                    | 6,586    | 84              | 1.28% |
| 2                            | 5,640                    | 5,503    | 137             | 2.49% |
| 3                            | 5,641                    | 5,504    | 137             | 2.49% |
| 4                            | 5,641                    | 5,504    | 137             | 2.49% |
| 5                            | 5,640                    | 5,503    | 137             | 2.49% |
| 6                            | 5,642                    | 5,505    | 137             | 2.49% |
| 7                            | 5,641                    | 5,504    | 137             | 2.49% |
| 8                            | 5,641                    | 5,504    | 137             | 2.49% |
| 9                            | 5,641                    | 5,504    | 137             | 2.49% |
| 10                           | 5,641                    | 5,503    | 137             | 2.49% |
| 11                           | 5,639                    | 5,502    | 137             | 2.49% |
| 12                           | 5,641                    | 5,504    | 137             | 2.49% |
| 13                           | 5,641                    | 5,504    | 137             | 2.49% |
| 14                           | 5,642                    | 5,505    | 137             | 2.49% |
| 15                           | 5,641                    | 5,504    | 137             | 2.49% |
| 16                           | 5,640                    | 5,503    | 137             | 2.49% |
| 17                           | 5,640                    | 5,503    | 137             | 2.49% |
| 18                           | 5,640                    | 5,503    | 137             | 2.49% |
| 19                           | 5,641                    | 5,504    | 137             | 2.49% |
| 20                           | 5,641                    | 5,504    | 137             | 2.49% |
| 21                           | 5,640                    | 5,503    | 137             | 2.49% |
| 22                           | 5,641                    | 5,504    | 137             | 2.49% |
| 23                           | 5,641                    | 5,504    | 137             | 2.49% |
| 24                           | 5,641                    | 5,504    | 137             | 2.49% |
| 25                           | 5,641                    | 5,504    | 137             | 2.49% |

Reduced Greenup  
Harvest Flow  
Western Supply  
Blocks

| WSBS                           |                          |          |                 |       |
|--------------------------------|--------------------------|----------|-----------------|-------|
| Basecase vs Basecase + greenup |                          |          |                 |       |
| Decade                         | Volume (000's m3/Decade) |          | Increase/Decade |       |
|                                | greenup                  | Basecase | 000's m3        | %     |
| 1                              | 6,603                    | 6,586    | 17              | 0.26% |
| 2                              | 5,533                    | 5,503    | 30              | 0.55% |
| 3                              | 5,534                    | 5,504    | 30              | 0.54% |
| 4                              | 5,534                    | 5,504    | 30              | 0.55% |
| 5                              | 5,533                    | 5,503    | 30              | 0.55% |
| 6                              | 5,535                    | 5,505    | 30              | 0.54% |
| 7                              | 5,534                    | 5,504    | 30              | 0.55% |
| 8                              | 5,534                    | 5,504    | 30              | 0.55% |
| 9                              | 5,534                    | 5,504    | 30              | 0.54% |
| 10                             | 5,533                    | 5,503    | 30              | 0.54% |
| 11                             | 5,532                    | 5,502    | 30              | 0.55% |
| 12                             | 5,534                    | 5,504    | 30              | 0.54% |
| 13                             | 5,534                    | 5,504    | 30              | 0.55% |
| 14                             | 5,535                    | 5,505    | 30              | 0.54% |
| 15                             | 5,534                    | 5,504    | 30              | 0.54% |
| 16                             | 5,534                    | 5,503    | 30              | 0.55% |
| 17                             | 5,533                    | 5,503    | 30              | 0.55% |
| 18                             | 5,533                    | 5,503    | 30              | 0.55% |
| 19                             | 5,534                    | 5,504    | 30              | 0.54% |
| 20                             | 5,533                    | 5,504    | 29              | 0.53% |
| 21                             | 5,533                    | 5,503    | 31              | 0.55% |
| 22                             | 5,534                    | 5,504    | 31              | 0.55% |
| 23                             | 5,533                    | 5,504    | 30              | 0.54% |
| 24                             | 5,534                    | 5,504    | 30              | 0.55% |
| 25                             | 5,534                    | 5,504    | 30              | 0.54% |

Reduction in Future Roads  
Western Supply  
Blocks

| WSBS                                               |                          |          |                 |       |
|----------------------------------------------------|--------------------------|----------|-----------------|-------|
| Basecase vs Basecase + less future roads reduction |                          |          |                 |       |
| Decade                                             | Volume (000's m3/Decade) |          | Increase/Decade |       |
|                                                    | future roads             | Basecase | 000's m3        | %     |
| 1                                                  | 6,623                    | 6,586    | 37              | 0.56% |
| 2                                                  | 5,573                    | 5,503    | 70              | 1.27% |
| 3                                                  | 5,574                    | 5,504    | 70              | 1.27% |
| 4                                                  | 5,574                    | 5,504    | 70              | 1.27% |
| 5                                                  | 5,573                    | 5,503    | 70              | 1.27% |
| 6                                                  | 5,575                    | 5,505    | 70              | 1.27% |
| 7                                                  | 5,574                    | 5,504    | 70              | 1.27% |
| 8                                                  | 5,574                    | 5,504    | 70              | 1.27% |
| 9                                                  | 5,574                    | 5,504    | 70              | 1.27% |
| 10                                                 | 5,573                    | 5,503    | 70              | 1.27% |
| 11                                                 | 5,572                    | 5,502    | 70              | 1.27% |
| 12                                                 | 5,574                    | 5,504    | 70              | 1.27% |
| 13                                                 | 5,574                    | 5,504    | 70              | 1.27% |
| 14                                                 | 5,574                    | 5,505    | 70              | 1.27% |
| 15                                                 | 5,574                    | 5,504    | 70              | 1.27% |
| 16                                                 | 5,574                    | 5,503    | 70              | 1.28% |
| 17                                                 | 5,573                    | 5,503    | 70              | 1.28% |
| 18                                                 | 5,573                    | 5,503    | 70              | 1.27% |
| 19                                                 | 5,573                    | 5,504    | 70              | 1.27% |
| 20                                                 | 5,573                    | 5,504    | 69              | 1.26% |
| 21                                                 | 5,574                    | 5,503    | 71              | 1.29% |
| 22                                                 | 5,574                    | 5,504    | 70              | 1.28% |
| 23                                                 | 5,574                    | 5,504    | 70              | 1.28% |
| 24                                                 | 5,574                    | 5,504    | 70              | 1.27% |
| 25                                                 | 5,573                    | 5,504    | 70              | 1.26% |

## **APPENDIX 4**

### **Timber Harvesting Landbase Components**

#### **Clearcutting vs Selection Harvest Areas**

**Components of the Timber Harvesting Landbase, William Lake TSA**

| <b>Category</b>              | <b>Area (ha)</b> | <b>%</b>       |
|------------------------------|------------------|----------------|
| Caribou Modified Arboreal    | 18,228           | 0.76%          |
| Caribou Modified Terrestrial | 81,687           | 3.39%          |
| Class 'B' Lake Buffer        | 8,691            | 0.36%          |
| Dry-belt Fir                 | 125,104          | 5.19%          |
| MDWR-fir Leading             | 167,216          | 6.93%          |
| Mountain Pine Beetle         | 430,282          | 17.84%         |
| PA16                         | 36,531           | 1.51%          |
| Visual Sensitivity Area      | 176,350          | 7.31%          |
| Clearcut Normal Rotation     | 1,277,896        | 52.98%         |
| WTP Double Rotation          | 89,996           | 3.73%          |
| <b>Total</b>                 | <b>2,411,980</b> | <b>100.00%</b> |

**Basecase Harvest Flow, Williams Lake Main TSA**

| Decade | Annual Harvest Volume (m3) |           |           |
|--------|----------------------------|-----------|-----------|
|        | Clearcut                   | Selection | Total     |
| 1*     | 2,528,600                  | 212,600   | 2,741,200 |
| 2      | 2,323,700                  | 96,100    | 2,419,800 |
| 3      | 2,336,200                  | 83,700    | 2,419,900 |
| 4      | 2,364,200                  | 55,600    | 2,419,800 |
| 5      | 2,350,800                  | 69,100    | 2,419,900 |
| 6      | 2,245,400                  | 174,400   | 2,419,800 |
| 7      | 2,204,800                  | 215,000   | 2,419,800 |
| 8      | 2,202,300                  | 217,600   | 2,419,900 |
| 9      | 2,229,600                  | 190,300   | 2,419,900 |
| 10     | 2,280,300                  | 139,500   | 2,419,800 |
| 11     | 2,305,700                  | 114,300   | 2,420,000 |
| 12     | 2,198,700                  | 221,200   | 2,419,900 |
| 13     | 2,067,800                  | 352,100   | 2,419,900 |
| 14     | 2,288,600                  | 131,200   | 2,419,800 |
| 15     | 2,262,100                  | 157,800   | 2,419,900 |
| 16     | 2,229,500                  | 190,300   | 2,419,800 |
| 17     | 2,137,000                  | 282,800   | 2,419,800 |
| 18     | 2,323,300                  | 96,500    | 2,419,800 |
| 19     | 2,240,000                  | 179,800   | 2,419,800 |
| 20     | 2,169,700                  | 250,200   | 2,419,900 |
| 21     | 2,124,300                  | 295,600   | 2,419,900 |
| 22     | 2,324,600                  | 95,300    | 2,419,900 |
| 23     | 2,167,400                  | 252,500   | 2,419,900 |
| 24     | 2,196,500                  | 223,400   | 2,419,900 |
| 25     | 2,311,500                  | 108,300   | 2,419,800 |

\* The first five year is 2,883,000 m3/year and the following five years is 2,600,000 m3/year.

## **APPENDIX 5**

### **SIBEC Factors for the Williams Lake TSA**

| Estimated SIBEC Site Index of Williams Lake TSA |            |     |                 |        |          |
|-------------------------------------------------|------------|-----|-----------------|--------|----------|
| Biogeozone                                      | BG_subzone | Var | Leading Species | Area   | SIBEC_SI |
| BG                                              | xh         | 3   | FD              | 58     | 12       |
| BG                                              | xw         | 2   | FD              | 1,832  | 13       |
| CWH                                             | ds         | 1   | CW              | 14     | 22       |
| CWH                                             | ds         | 1   | FD              | 23     | 26       |
| CWH                                             | ds         | 1   | PL              | 158    | 16       |
| CWH                                             | ds         | 1   | S               | 11     | 28       |
| ESSF                                            | mw         |     | PL              | 60     | 16       |
| ESSF                                            | mw         |     | S               | 27     | 15       |
| ESSF                                            | wc         | 3   | B               | 4,163  | 15       |
| ESSF                                            | wc         | 3   | BL              | 3,695  | 15       |
| ESSF                                            | wc         | 3   | CW              | 144    | 10       |
| ESSF                                            | wc         | 3   | FD              | 626    | 12       |
| ESSF                                            | wc         | 3   | PL              | 2,847  | 12       |
| ESSF                                            | wc         | 3   | S               | 14,024 | 15       |
| ESSF                                            | wc         | 3   | SE              | 25     | 15       |
| ESSF                                            | wc         | 3   | SW              | 355    | 15       |
| ESSF                                            | wk         | 1   | AC              | 48     | 16       |
| ESSF                                            | wk         | 1   | AT              | 418    | 15       |
| ESSF                                            | wk         | 1   | B               | 4,101  | 15       |
| ESSF                                            | wk         | 1   | BL              | 5,043  | 15       |
| ESSF                                            | wk         | 1   | CW              | 4,620  | 10       |
| ESSF                                            | wk         | 1   | EP              | 48     | 10       |
| ESSF                                            | wk         | 1   | FD              | 5,263  | 14       |
| ESSF                                            | wk         | 1   | H               | 295    | 10       |
| ESSF                                            | wk         | 1   | HW              | 1,072  | 10       |
| ESSF                                            | wk         | 1   | PL              | 20,684 | 18       |
| ESSF                                            | wk         | 1   | S               | 48,549 | 15       |
| ESSF                                            | wk         | 1   | SE              | 88     | 15       |
| ESSF                                            | wk         | 1   | SW              | 303    | 15       |
| ESSF                                            | xv         |     | PL              | 5,345  | 15       |
| ESSF                                            | xv         |     | S               | 527    | 12       |
| ESSF                                            | xv         | 1   | B               | 184    | 10       |
| ESSF                                            | xv         | 1   | FD              | 397    | 10       |
| ESSF                                            | xv         | 1   | PA              | 666    | 12       |
| ESSF                                            | xv         | 1   | PL              | 27,876 | 15       |
| ESSF                                            | xv         | 1   | S               | 1,307  | 12       |
| ESSF                                            | xv         | 1   | SE              | 180    | 12       |
| ESSF                                            | xv         | 2   | B               | 507    | 10       |
| ESSF                                            | xv         | 2   | PL              | 31,576 | 15       |
| ESSF                                            | xv         | 2   | S               | 2,740  | 12       |
| ESSF                                            | xv         | 2   | SW              | 84     | 12       |

| Biogeozone | BG_subzone | Var | Leading Species | Area    | SIBEC_SI |
|------------|------------|-----|-----------------|---------|----------|
| ICH        | mk         | 3   | AC              | 277     | 16       |
| ICH        | mk         | 3   | AT              | 1,298   | 10       |
| ICH        | mk         | 3   | B               | 610     | 16       |
| ICH        | mk         | 3   | BL              | 1,565   | 16       |
| ICH        | mk         | 3   | CW              | 4,128   | 12       |
| ICH        | mk         | 3   | EP              | 794     | 10       |
| ICH        | mk         | 3   | FD              | 17,500  | 22       |
| ICH        | mk         | 3   | H               | 33      | 12       |
| ICH        | mk         | 3   | HW              | 21      | 12       |
| ICH        | mk         | 3   | PL              | 9,871   | 22       |
| ICH        | mk         | 3   | S               | 19,058  | 21       |
| ICH        | mk         | 3   | SB              | 10      | 21       |
| ICH        | mk         | 3   | SW              | 55      | 21       |
| ICH        | wk         | 2   | AC              | 20      | 16       |
| ICH        | wk         | 2   | AT              | 32      | 10       |
| ICH        | wk         | 2   | B               | 664     | 16       |
| ICH        | wk         | 2   | BL              | 1,009   | 16       |
| ICH        | wk         | 2   | CW              | 21,795  | 15       |
| ICH        | wk         | 2   | EP              | 103     | 10       |
| ICH        | wk         | 2   | FD              | 23,383  | 23       |
| ICH        | wk         | 2   | H               | 2,906   | 12       |
| ICH        | wk         | 2   | HM              | 68      | 12       |
| ICH        | wk         | 2   | HW              | 13,936  | 12       |
| ICH        | wk         | 2   | PL              | 9,076   | 22       |
| ICH        | wk         | 2   | S               | 16,261  | 21       |
| ICH        | wk         | 2   | SB              | 5       | 21       |
| ICH        | wk         | 2   | SE              | 172     | 21       |
| ICH        | wk         | 2   | SW              | 72      | 21       |
| ICH        | wk         | 4   | B               | 204     | 18       |
| ICH        | wk         | 4   | BL              | 189     | 18       |
| ICH        | wk         | 4   | CW              | 318     | 16       |
| ICH        | wk         | 4   | FD              | 1,438   | 22       |
| ICH        | wk         | 4   | H               | 259     | 16       |
| ICH        | wk         | 4   | HW              | 51      | 16       |
| ICH        | wk         | 4   | PL              | 3,676   | 22       |
| ICH        | wk         | 4   | S               | 4,626   | 22       |
| IDF        | dk         | 3   | AT              | 1,362   | 10       |
| IDF        | dk         | 3   | EP              | 8       | 10       |
| IDF        | dk         | 3   | FD              | 116,492 | 15       |
| IDF        | dk         | 3   | PL              | 68,207  | 18       |
| IDF        | dk         | 3   | S               | 4,056   | 18       |
| IDF        | dk         | 3   | SW              | 12      | 18       |
| IDF        | dk         | 4   | AC              | 10      | 10       |
| IDF        | dk         | 4   | AT              | 44      | 10       |
| IDF        | dk         | 4   | FD              | 72,290  | 12       |
| IDF        | dk         | 4   | PL              | 184,357 | 12       |

| Biogeozone | BG_subzone | Var | Leading Species | Area    | SIBEC_SI |
|------------|------------|-----|-----------------|---------|----------|
| IDF        | dk         | 4   | SW              | 144     | 15       |
| IDF        | dw         |     | FD              | 8,815   | 15       |
| IDF        | dw         |     | PL              | 12,191  | 18       |
| IDF        | dw         |     | S               | 188     | 12       |
| IDF        | dw         |     | SE              | 64      | 12       |
| IDF        | unv        |     | FD              | 97      | 12       |
| IDF        | unv        |     | PL              | 1,696   | 12       |
| IDF        | unv        |     | S               | 125     | 12       |
| IDF        | xm         |     | AT              | 93      | 10       |
| IDF        | xm         |     | FD              | 52,823  | 15       |
| IDF        | xm         |     | PL              | 8,861   | 12       |
| IDF        | xm         |     | S               | 607     | 18       |
| MH         | mm         | 2   | S               | 113     | 16       |
| MS         | dc         | 2   | FD              | 1,488   | 15       |
| MS         | dc         | 2   | PA              | 88      | 10       |
| MS         | dc         | 2   | PL              | 8,405   | 18       |
| MS         | dc         | 2   | S               | 786     | 15       |
| MS         | dc         | 2   | SE              | 25      | 15       |
| MS         | dv         |     | PA              | 30      | 10       |
| MS         | dv         |     | PL              | 9,905   | 18       |
| MS         | dv         |     | S               | 718     | 15       |
| MS         | xk         |     | FD              | 129     | 15       |
| MS         | xk         |     | PL              | 2,575   | 15       |
| MS         | xk         |     | S               | 42      | 12       |
| MS         | xv         |     | B               | 8       | 10       |
| MS         | xv         |     | FD              | 594     | 10       |
| MS         | xv         |     | PA              | 149     | 10       |
| MS         | xv         |     | PL              | 332,699 | 18       |
| MS         | xv         |     | S               | 13,921  | 12       |
| MS         | xv         |     | SE              | 1,059   | 12       |
| MS         | xv         |     | SW              | 501     | 12       |
| SBPS       | dc         |     | FD              | 127     | 12       |
| SBPS       | dc         |     | PL              | 73,481  | 16       |
| SBPS       | dc         |     | S               | 1,530   | 16       |
| SBPS       | dc         |     | SB              | 7       | 12       |
| SBPS       | mc         |     | PL              | 26,831  | 12       |
| SBPS       | mc         |     | S               | 4,236   | 10       |
| SBPS       | mk         |     | AC              | 312     | 12       |
| SBPS       | mk         |     | AT              | 2,643   | 10       |
| SBPS       | mk         |     | EP              | 228     | 10       |
| SBPS       | mk         |     | FD              | 3,631   | 16       |
| SBPS       | mk         |     | PL              | 51,653  | 18       |
| SBPS       | mk         |     | S               | 5,714   | 16       |
| SBPS       | mk         |     | SB              | 7       | 12       |
| SBPS       | xc         |     | AT              | 16      | 10       |
| SBPS       | xc         |     | FD              | 9,380   | 12       |

| Biogeozone | BG_subzone | Var | Leading Species | Area   | SIBEC_SI |
|------------|------------|-----|-----------------|--------|----------|
| SBPS       | xc         |     | SE              | 4,341  | 16       |
| SBPS       | xc         |     | SW              | 776    | 16       |
| SBS        | dw         | 1   | AC              | 937    | 12       |
| SBS        | dw         | 1   | AT              | 7,067  | 12       |
| SBS        | dw         | 1   | B               | 70     | 15       |
| SBS        | dw         | 1   | BL              | 835    | 15       |
| SBS        | dw         | 1   | CW              | 59     | 10       |
| SBS        | dw         | 1   | EP              | 444    | 10       |
| SBS        | dw         | 1   | FD              | 25,975 | 21       |
| SBS        | dw         | 1   | PL              | 28,483 | 24       |
| SBS        | dw         | 1   | S               | 14,010 | 22       |
| SBS        | dw         | 1   | SW              | 42     | 22       |
| SBS        | dw         | 2   | AC              | 16     | 12       |
| SBS        | dw         | 2   | AT              | 946    | 12       |
| SBS        | dw         | 2   | B               | 16     | 15       |
| SBS        | dw         | 2   | BL              | 68     | 15       |
| SBS        | dw         | 2   | FD              | 15,250 | 18       |
| SBS        | dw         | 2   | PL              | 23,271 | 21       |
| SBS        | dw         | 2   | S               | 4,092  | 18       |
| SBS        | dw         | 2   | SB              | 8      | 18       |
| SBS        | mc         | 1   | AT              | 141    | 12       |
| SBS        | mc         | 1   | B               | 141    | 15       |
| SBS        | mc         | 1   | BL              | 35     | 15       |
| SBS        | mc         | 1   | EP              | 13     | 10       |
| SBS        | mc         | 1   | FD              | 355    | 18       |
| SBS        | mc         | 1   | PL              | 7,647  | 18       |
| SBS        | mc         | 1   | S               | 2,619  | 18       |
| SBS        | mh         |     | FD              | 1,800  | 21       |
| SBS        | mh         |     | PL              | 506    | 21       |
| SBS        | mh         |     | S               | 652    | 21       |
| SBS        | mw         |     | B               | 22     | 15       |
| SBS        | mw         |     | BL              | 10     | 15       |
| SBS        | mw         |     | CW              | 35     | 10       |
| SBS        | mw         |     | FD              | 1,236  | 21       |
| SBS        | mw         |     | PL              | 927    | 21       |
| SBS        | mw         |     | S               | 360    | 21       |
| SBS        | wk         | 1   | B               | 77     | 15       |
| SBS        | wk         | 1   | BL              | 282    | 15       |
| SBS        | wk         | 1   | CW              | 39     | 10       |
| SBS        | wk         | 1   | FD              | 863    | 21       |
| SBS        | wk         | 1   | PL              | 4,051  | 21       |
| SBS        | wk         | 1   | S               | 3,178  | 18       |
| SBS        | wk         | 1   | SW              | 59     | 18       |

## **APPENDIX 6**

### **Old Growth Deficits**

Williams Lake Timber Supply Area – “Type 2 Forest Level Silviculture Analysis Report”

| LU/BEC/NDTs currently without sufficient old-growth or mature stands in Williams Lake Main TSA |          |      |               |            |            |                    |          |              |                 |
|------------------------------------------------------------------------------------------------|----------|------|---------------|------------|------------|--------------------|----------|--------------|-----------------|
| Lsc_name                                                                                       | BEC zone | NDT  | Basearea (ha) | % required | % achieved | Area achieved (ha) | Status   | Age criteria | Years locked up |
| Alkali                                                                                         | IDFFD    | NDT4 | 23,627        | 21         | 2          | 521                | VIOLATED | 250          | 20              |
| Anaham                                                                                         | IDFFD    | NDT4 | 9,232         | 21         | 16         | 1504               | VIOLATED | 250          | 10              |
| Anaham                                                                                         | IDFOT    | NDT4 | 11,788        | 11         | 6          | 679                | VIOLATED | 140          | 5               |
| Beaver Valley                                                                                  | ICH      | NDT2 | 8,931         | 6          | 4          | 336                | VIOLATED | 250          | 20              |
| Beaver Valley                                                                                  | SBS      | NDT3 | 32,637        | 8          | 7          | 2130               | VIOLATED | 140          | 5               |
| Beece Creek                                                                                    | ESSF     | NDT2 | 5,051         | 9          | 0          | 0                  | VIOLATED | 250          | 10              |
| Black Creek                                                                                    | ESSF     | NDT1 | 13,029        | 19         | 4          | 554                | VIOLATED | 250          | 50              |
| Black Creek                                                                                    | SBS      | NDT3 | 20,872        | 11         | 4          | 845                | VIOLATED | 140          | 10              |
| Cariboo Lake                                                                                   | ESSF     | NDT1 | 21,207        | 17         | 10         | 2125               | VIOLATED | 250          | 10              |
| Chimney                                                                                        | IDFFD    | NDT4 | 34,918        | 32         | 2          | 849                | VIOLATED | 250          | 10              |
| Chimney                                                                                        | IDFOT    | NDT4 | 6,372         | 16         | 7          | 452                | VIOLATED | 140          | 5               |
| Clisbako                                                                                       | MS       | NDT3 | 7,672         | 14         | 10         | 772                | VIOLATED | 140          | 20              |
| Clusko                                                                                         | MS       | NDT3 | 40,970        | 14         | 11         | 4586               | VIOLATED | 140          | 10              |
| Dash                                                                                           | ESSF     | NDT2 | 12,962        | 9          | 0          | 0                  | VIOLATED | 250          | 10              |
| Dog Creek                                                                                      | IDFFD    | NDT4 | 14,780        | 21         | 6          | 891                | VIOLATED | 250          | 20              |
| Dog Creek                                                                                      | IDFOT    | NDT4 | 7,411         | 11         | 6          | 451                | VIOLATED | 140          | 5               |
| Eastside                                                                                       | ESSF     | NDT1 | 12,497        | 19         | 13         | 1579               | VIOLATED | 250          | 20              |
| Farwell                                                                                        | IDFFD    | NDT4 | 12,665        | 21         | 4          | 500                | VIOLATED | 250          | 50              |
| Hawks Creek                                                                                    | IDFFD    | NDT4 | 20,426        | 21         | 1          | 241                | VIOLATED | 250          | 50              |
| Hawks Creek                                                                                    | IDFOT    | NDT4 | 8,553         | 11         | 4          | 372                | VIOLATED | 140          | 5               |
| Horsefly                                                                                       | ESSF     | NDT1 | 9,765         | 19         | 12         | 1215               | VIOLATED | 250          | 20              |
| Horsefly                                                                                       | ICH      | NDT2 | 18,394        | 9          | 4          | 666                | VIOLATED | 250          | 100             |
| Little River                                                                                   | ESSF     | NDT1 | 24,473        | 19         | 15         | 3681               | VIOLATED | 250          | 20              |
| Lower Cariboo                                                                                  | ESSF     | NDT1 | 16,202        | 18         | 11         | 1709               | VIOLATED | 250          | 20              |
| Lower Cariboo                                                                                  | ICH      | NDT1 | 9,315         | 12         | 4          | 332                | VIOLATED | 250          | 40              |
| Lower Cariboo                                                                                  | SBS      | NDT2 | 7,888         | 6          | 1          | 57                 | VIOLATED | 250          | 130             |
| Mackin                                                                                         | IDFFD    | NDT4 | 8,236         | 15         | 4          | 359                | VIOLATED | 250          | 10              |
| McKay                                                                                          | ESSF     | NDT1 | 17,188        | 19         | 7          | 1190               | VIOLATED | 250          | 20              |
| McKinley                                                                                       | ICH      | NDT2 | 14,024        | 13         | 2          | 289                | VIOLATED | 250          | 70              |
| McKuskey                                                                                       | ESSF     | NDT1 | 11,934        | 19         | 11         | 1270               | VIOLATED | 250          | 5               |
| Meldrum                                                                                        | IDFFD    | NDT4 | 18,893        | 21         | 4          | 819                | VIOLATED | 250          | 5               |
| Meldrum                                                                                        | IDFOT    | NDT4 | 8,691         | 11         | 5          | 423                | VIOLATED | 140          | 5               |
| Minton                                                                                         | IDFFD    | NDT4 | 16,455        | 32         | 13         | 2177               | VIOLATED | 250          | 30              |
| Moffat                                                                                         | ESSF     | NDT1 | 13,801        | 13         | 9          | 1290               | VIOLATED | 250          | 10              |
| Polly                                                                                          | ICH      | NDT2 | 22,880        | 46         | 46         | 10505              | VIOLATED | 100          | 5               |
| Polly                                                                                          | ICH      | NDT2 | 22,880        | 13         | 7          | 1533               | VIOLATED | 250          | 60              |
| Polly                                                                                          | SBS      | NDT3 | 12,212        | 16         | 2          | 204                | VIOLATED | 140          | 10              |
| Pyper                                                                                          | IDFOT    | NDT4 | 27,072        | 6          | 4          | 1145               | VIOLATED | 140          | 10              |
| Pyper                                                                                          | SBPS     | NDT3 | 32,638        | 4          | 3          | 879                | VIOLATED | 140          | 10              |
| Riske                                                                                          | IDFFD    | NDT4 | 20,735        | 21         | 4          | 816                | VIOLATED | 250          | 10              |
| Riske                                                                                          | IDFOT    | NDT4 | 15,862        | 11         | 9          | 1436               | VIOLATED | 140          | 5               |
| Rwan                                                                                           | IDFOT    | NDT4 | 6,620         | 16         | 14         | 896                | VIOLATED | 140          | 5               |
| Upper Churn                                                                                    | ESSF     | NDT2 | 10,004        | 9          | 3          | 313                | VIOLATED | 250          | 10              |
| Wasko/Lynx                                                                                     | ESSF     | NDT1 | 7,814         | 15         | 14         | 1112               | VIOLATED | 250          | 5               |
| Williams Lake                                                                                  | IDFFD    | NDT4 | 25,697        | 21         | 0          | 28                 | VIOLATED | 250          | 20              |

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