TFL 1

Timber Supply Analysis

October 2003

Sterling Wood Group Inc.
Victoria BC
www.sterlingwood.com

624990

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1.0 INTRODUCTION

This report describes the timber supply analysis for TFL 1, which is part of Management Plan 10 scheduled to take effect in 2004. The Chief Forester will consider the analysis results in the allowable annual cut determination for the period 2004-2008.

The four main sections in this report are:

1. Landbase assumptions
2. Yield assumptions
3. Management assumptions
4. Results

2.0 LANDBASE

The landbase information used in this analysis includes the following:

- TFL 1 reinventory completed in 1992, with attributes and silviculture history projected to 2001
- Age, height, and site index adjustment for stands currently aged 30 to 110, and age and height adjustment for stands currently aged 10 to 29 years, based on the 2001-2003 Vegetation Resources Inventory second growth project (see TFL 1 Vegetation Resources Inventory Adjustment report)
- Kalum Land and Resource Management Plan 2002 (LRMP) spatially defined resource management zones

2.1 TIMBER HARVESTING LANDBASE

The timber supply analysis information package has a detailed description of the landbase assumptions used for this analysis. An additional 1919ha has been added to the timber harvesting landbase since the initial information package. This area was originally mislabeled as inoperable. The final information package in Appendix 1 and table 1 below includes this additional operable area. Table 1 shows the steps of the landbase determination. Landbase reductions are made in the order listed in the table.

Table 1: Timber harvesting landbase determination

DESCRIPTION	Area Schedule A ha	Area Schedule B ha	Total Area ha
Total land base	635	517662	518297
Non-forest	92	273951	274042
Non-productive forest	12	14864	14876
Total productive forest	**532**	**228847**	**229379**
Less:			
Inoperable	64	118936	119001
Non commercial	0	87	87
Low site	0	2950	2950
Deciduous	28	1430	1459
Non-merchantable	8	1492	1500
ESAs	0	5519	5519
Alpine Tundra	0	112	112
Riparian zones	23	2530	2553
Specific geographically defined area	10	906	915
Goat winter range	0	1102	1102
Unclassified roads, trails and landings	5	2054	2059
NSR	11	2929	2940
Wildlife tree patch	25	2501	2526
Total Current Reduction	176	142547	142723
Initial Timber Harvesting Land Base	**355**	**86301**	**86656**
Additions:			
NSR	11	2929	2940
Total Additions	11	2929	2940
Current Timber Harvesting Land Base	**366**	**89230**	**89596**
Future Reductions:			
Future roads, trails, landings	17	3418	3435
Future Timber Harvesting Land Base	**349**	**85812**	**86161**

*numbers may not add up exactly due to rounding

As shown in Table 1, the current timber harvesting landbase (THLB) is 89,596 ha, including 2940 ha NSR. The current THLB is 39% of the TFL 1 productive forest area. As harvesting proceeds, 6.0 % of harvested areas are withdrawn from the THLB for future roads. This reduction is applied to stands currently $\geq$ 35 years, resulting in approximately a further 3.8% reduction to the current THLB over time for future roads.

Figures 1 and 2 show area summaries of the current timber harvesting landbase by leading species and age class. Approximately 52% of the current THLB is greater than 120 years as shown in figure 2.

Figure 1: THLB area distribution by leading species

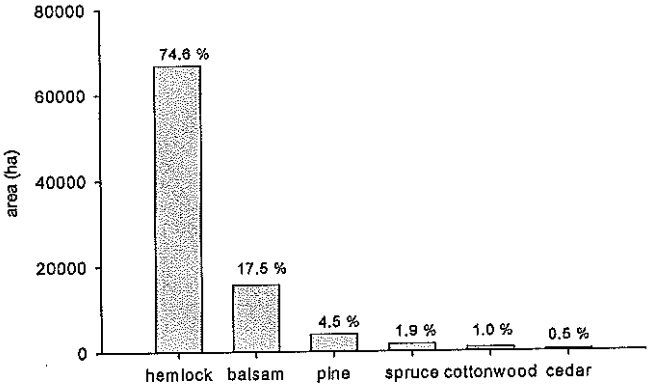
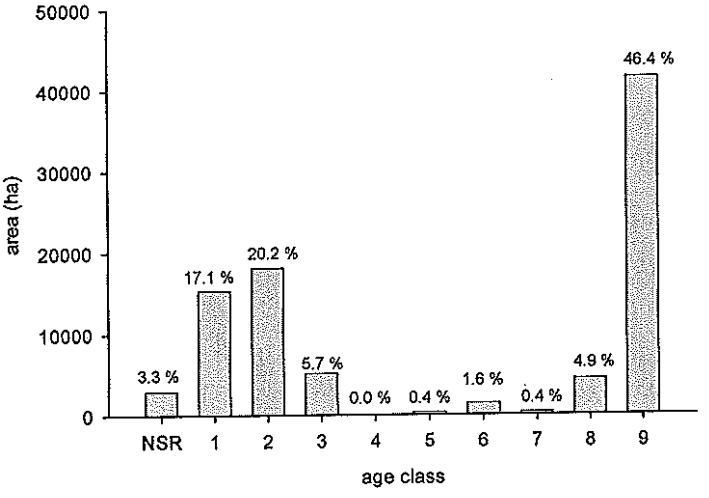


Figure 2: THLB area distribution by age class



2.2 MANAGEMENT ZONES

TFL 1 is divided into management zones based on forest management objectives consistent with the Kalum LRMP 2002, and defined by GIS coverages. Harvest constraints for the management zones are described in section 4. Complete management zones are described in the information package. The following management zones group THLB areas by management practices.

Table 2: TFL 1 management zones

Management Zone	Characteristics	Timber harvesting landbase ha
General	All areas not assigned to one of the other management zones, and includes the THLB portion of the mountain goat winter range, moose winter range, backcountry recreation, and Miligit area that is not included in a VQO zone.	64750
Copper watershed/ Grizzly Bear	LRMP, additional seral stage requirements. Critical grizzly patch habitats accounted for in the THLB determination. 453 ha overlap with partial retention management zone.	9237
Retention VQO zone	LRMP, includes 29ha of VQO preservation, and retention area in the Kiteen-Cedar low level pass retention area. Additional green-up constraints.	1610
Partial retention VQO zone	LRMP, additional green-up constraints. Includes partial retention areas identified in the Miligit special management zone and the Kiteen-Cedar low level pass area.	9043

* management zones overlap, therefore THLB areas do not add up to landbase determination total

3.0 YIELD ASSUMPTIONS

3.1 SITE INDEX

Site index and site class have been assigned to each polygon in the inventory database as follows:

- Stands ≥ 30 years: VDYP Batch version 6.6d breast height age 50 site index
- Stands < 30 years: inventory site index

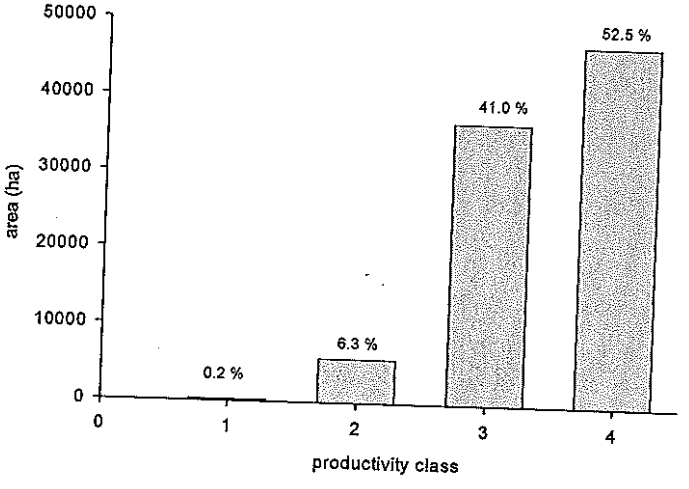
Inventory site index of stands currently aged 30 to 110 years was adjusted from the previous inventory as described by the Vegetation Resources Inventory Report in Appendix 1. VDYP site index is based on the VRI adjusted ages and heights. A sensitivity analysis shows the effects of using unadjusted attributes.

Four productivity site classes are based on site index breast height age 50:

Productivity site class 1:	BH50 SI > 35
Productivity site class 2:	25 < BH50 SI ≤ 35
Productivity site class 3:	15 < BH50 SI ≤ 25
Productivity site class 4:	3 < BH50 SI ≤ 15

Figure 3 shows the THLB area distribution by site productivity class. This shows that more than half of the THLB has site index less than or equal to 15.

Figure 3: THLB area distribution by site productivity class



3.2 ANALYSIS UNITS

Analysis units with associated weighted average site index are shown in Table 3. Two growth and yield models were used to estimate volumes by analysis unit: Variable Density Yield Prediction (VDYP)

windows version 1.1, core version 6.6d for existing natural stands; and the Table Interpolation Program for Stand Yields (TIPSY) version 3.0e for managed stands. Existing natural stands are defined as stands currently ≥ 30 years old, excluding spaced stands, and all cottonwood leading stands. Managed stands are defined as stands currently < 30 years old, all currently spaced stands, and all existing natural stands once harvested, except cottonwood leading stands.

Table 3: Analysis unit definitions and site index

Analysis Unit	FIZ	Leading species	Age class	Site class	Weighted average SI	Current timber harvesting landbase (ha)
1	A	hemlock, cedar	All	1, 2	27.6	3331
2	A	hemlock, cedar	1 – 7	3	20.5	14997
3	A	hemlock, cedar	1 – 7	4	12.4	2796
4	A	hemlock, cedar	8, 9	3	16.7	4046
5	A	hemlock, cedar	8, 9	4	11.9	29667
6	A	balsam	All	1, 2	28.1	1602
7	A	balsam	All	3	20.7	6958
8	A	balsam	All	4	12.1	3644
9	A	spruce	All	1 – 4	16.0	1246
10	A	pine	All	2 – 4	19.7	2577
11	A	cottonwood	All	2 – 4	25.9	626
12	J	hemlock, cedar	1 – 7	2, 3	19.8	4511
13	J	hemlock, cedar	1 – 7	4	13.9	775
14	J	hemlock, cedar	8, 9	3	17.1	704
15	J	hemlock, cedar	8, 9	4	10.8	6420
16	J	balsam	All	2, 3	21.4	1003
17	J	balsam	All	4	11.8	2544
18	J	spruce	All	1 – 4	20.3	375
19	J	pine	All	2 – 4	19.3	1492
20	J	cottonwood	All	1 – 4	19.6	283
Total						89596

3.3 EXISTING STAND YIELDS

The initial information package amendment, dated June 2003, described adjustments made to VDYP yields to ensure the yields are consistent with the inventory volumes, and in line with the yields used for

the 1998 yield analysis. Upon further examination of these yields, concern was raised that the average volume per hectare of old growth stands was higher than expected for the TFL. Based on the extensive consideration given to old growth yields in the previous analysis, old growth existing stand yields were readjusted as follows.

1. VDYP yields generated for each analysis unit using weighted average species composition and site index, and VDYP default crown closure. This is the same first step used for deriving the yields as described in the information package.

2. 1998 analysis average volume per hectare for stands > 250 years calculated at 464 m^3/ha. This average applies to the THLB only. This average was considered reasonable, with yields in 1998 adjusted based on audit plot information.

3. 2003 analysis average volume per hectare for THLB >250 years, using yields from step 1 calculated at 493 m^3/ha.

4. Factor of 0.94 applied to all old growth volumes (>140 years) for all analysis units to create final existing stand yield curves.

These changes are also documented in the final timber supply analysis information package.

3.4 MANAGED STAND YIELDS

The information package describes the use of TIPSY to generate managed stand yields. Two sets of managed stand yield tables are used in the analysis: natural regeneration; and natural regeneration with spacing treatment to 800 stems per hectare. Yield tables are included in Appendix 1.

For the base case harvest forecast, old growth site index adjustments are applied as described below. Sensitivity analyses are run that show the effects of site index adjustment. Note that managed stand yields for the 1999 analysis assumed old growth site index adjustment for hemlock leading stands 140 years or older in the CWH biogeoclimatic zone, based on the 1997 Nigh and Love report.

Base case site productivity

Old growth site index adjustment was applied as follows to determine the managed stand yields:

1. Based on the Nigh and Love 1997 report, *Site Index Adjustment for Old-growth Coastal Western Hemlock Stands in the Kalum Forest District*, a 10m SI adjustment is applied to hemlock leading, current age class 8 and 9 stands in the CWH portion of the TFL following clearcut harvest. This adjustment is applied only to AUs with current site index between 8 and 18m, where site index was derived from Wiley's 1978 height-age model, with height and age based on previously unmanaged old growth stands. This adjustment is therefore applied to AUs 4 and 5.

2. Based on the Nigh 1998 report, *Site Index Adjustments for Old-growth Stands Based on Veteran Trees*, site index adjustments are applied for interior hemlock based on the equation provided. The adjustment is applied on a polygon basis to age class 8 and 9 stands to determine the regenerated analysis unit site index. Per the report application guidelines, the old-growth site index must be

derived from the height and age of the old growth stand using the same site curves used to develop the adjustment equations, and the equations are applied only within the range of site indices sampled for the old growth trees in the study. This adjustment applies to AUs 14 and 15. The equation used is:

Interior hemlock: 11.42 + 0.5430 (SIoG)

3. Site index adjustment is not applied to other AUs.

These adjustments are summarized in the following table.

Table 4: Base case old growth site index adjustment

Existing stand AU	Existing stand SI m	Regenerated stand SI 10m adjustment m	Regenerated stand SI Nigh 1998 equations m	Base case managed stand SI m
4	16.7	26.7		26.7
5	11.9	21.9		21.9
14	17.1		20.7	20.7
15	10.8		17.3	17.3

Site productivity sensitivity analyses

The following sensitivity analyses show the effects of site productivity on harvest forecasts.

1. No old growth site index adjustment; site index adjustment effectively occurs only due to regeneration assumptions.
   Site indices for AUs 4,5,14,15 are effectively adjusted only as a result of the regeneration assumptions for this scenario. As shown in the information package, AU 4 regenerates to AU 2; AU 5 to AU 3; AU 14 to AU 12; and AU 15 to AU 13. Other AUs have no change to site index from existing stands to regenerated stands. The effective site index adjustment for these AUs is shown in table 5.

Table 5: Site productivity adjustment for AUs 4, 5, 14, 15 based on regeneration assumptions only

Existing stand AU	Regenerated stand AU	Existing stand SI m	Regenerated stand SI m	Effective SI adjustment m
4	2	16.7	20.5	3.8
5	3	11.9	12.4	0.5
14	12	17.1	19.8	2.7
15	13	10.8	13.9	3.1

2. Other site productivity sensitivity scenarios:

   - 5m site index adjustment applied to AUs 4 and 5 only
   - 10m site index adjustment applied to AUs 4 and 5 only
   - veteran study (Nigh 1998) adjustment applied to AUs 4,5,14,15

   As shown in table 5 above, site index is effectively increased for AUs 14 and 15 by 2.7m and 3.1m respectively, if not otherwise adjusted, based on regeneration assumptions. No adjustments are made for AUs not identified in the following table. Table 6 shows the site index adjustment for these additional scenarios.

Table 6: Site productivity adjustment

Existing stand AU	Existing stand SI m	5m site index adjustment: regenerated stand SI m	10m site index adjustment: regenerated stand SI m	veteran study site index adjustment: regenerated stand SI m
4	16.7	21.7	26.7	27.4
5	11.9	16.9	21.9	24.0
14	17.1	19.8*	19.8*	20.7
15	10.8	13.9*	13.9*	17.3

- site index based on regeneration assumptions, per table 5

The 10m site index adjustments are made for AU 4 and AU 5 as per the base case site productivity. An analysis is also made with a 5m site adjustment for AU 4 and AU 5 regenerated stands.

The veteran study site index adjustment is the same as for the base site productivity discussed above for AUs 14 and 15. Site index adjustments are also applied to AUs 4 and 5 per the Nigh 1998 report for this scenario based on the equation: Coast hemlock: 15.47 + 0.7144 (SI_{oc}).

4.0 MANAGEMENT ASSUMPTIONS

4.1 FOREST COVER CONSTRAINTS

Forest cover constraints are further discussed in the information package. Two types of cover constraints are applied in the analysis: green-up constraints applied by management zone; and landscape level seral stage requirements.

The green-up period after logging is defined during which time the replacement stands are expected to reach a specified height. The maximum disturbance area is applied to the timber harvesting landbase, or the total productive landbase as shown.

Table 7: Green-up cover constraints by management zone

Management Zone	Green-up height m	Green-up maximum allowable disturbance % area	Application
General	3	35	THLB
Copper watershed/ Grizzly Bear	5	25	productive landbase
Retention VQO zone	5	5	productive landbase
Partial retention VQO zone	5	15	productive landbase
Modification VQO zone	5	25	productive landbase

Landscape biodiversity constraints are applied by draft MOF landscape unit, biogeoclimatic variant, natural disturbance type, and biodiversity emphasis. Biodiversity emphasis is identified in the inventory database. Old seral constraints are applied to the productive forest area, consistent with the Landscape Unit Planning Guide. Old seral age is >250 years throughout TFL 1. Constraints are identified only for the draft landscape unit - BEC combinations which contain area in the timber harvesting landbase, and are shown in Appendix 1.

The LRMP defines an additional forest cover constraint for grizzly bear management in the Copper watershed portion of the Kleanza-Treasure Landscape Unit. This management zone has maximum retention of 30% of the productive forest landbase between the ages of 25 and 100 years.

4.2 WILDLIFE TREE PATCHES

Wildlife tree patch requirements were calculated using Table A3.1 of the Landscape Unit Planning Guide, March 1999. As described in the information package, 15 combinations of subzones and landscape units require wildlife tree retention between 1% and 10% of cutblocks. Wildlife tree patches were excluded from the THLB as shown in the landbase determination for this analysis.

4.3 TIMBER HARVESTING

All harvesting was clearcut in this analysis. Approximately 5% of the THLB requires non conventional harvest methods. Unsalvageable losses are estimated at 2900 m^3/year.

Minimum harvest volume in this analysis is 300 m^3/ha, except for the AUs that contain the majority of the non-conventional volume: 4,5,8,15. Minimum volume is 350 m^3/ha for these AUs. Minimum ages are shown in the information package and are based on the age at which the stand reaches minimum volume, or 60 years, whichever is less. Minimum ages are adjusted where yield tables are adjusted, for example for site index adjustment scenarios.

The initial harvest level was set to maximize the AAC initially, followed by a maximum decline of 10% in each of the following decades, and to avoid harvest shortfalls below the long term level. The long-term level is defined as the harvest that will maintain a stable long term growing stock of timber.

5.0 RESULTS

The following scenarios are described.

Table 8: Harvest forecasts

Scenario	Description
I	VRI adjusted inventory- base site productivity 1. base 2. 10% THLB increase 3. 10% THLB decrease 4. 10% volume increase 5. 10% volume decrease
II	VRI adjusted inventory-SI productivity options 1. no OGSI adjustment 2. 5m SI adjustment AUs 4 & 5 3. 10m SI adjustment AUs 4 & 5 4. veteran study SI adjustment
III	Unadjusted inventory-see section 4.1 1. no OGSI adjustment 2. base OGSI adjustment
IV	Current landbase with MP9 management assumptions, yield curves, and operability

All harvest forecasts have the following characteristics:

- forecasts model the silviculture and harvesting systems in current use, existing legislation, and the current strategic planning environment except where stated otherwise. The management assumptions are therefore structured to be consistent with the Forest Practices Code, the Kalum LRMP, and the defined LRMP management zones.
- forecasts use the current inventory with second growth stand adjustments for age, height, and site index as described in section 2 except where stated otherwise.
- volumes are net the estimated 2900 m^3/year unsalvaged loss.
- a minimum 10 year merchantable timber supply is available at all times.
- reduction in harvest volume between decades is maximum 10%.

5.1 SCENARIO I: VRI ADJUSTED INVENTORY, BASE SITE PRODUCTIVITY

The base site productivity analysis forms the basis for the recommended harvest level. The harvest forecasts show that a reduction from the current AAC is required given the current THLB, and the management objectives, constraints, and assumptions. Uncertainty in these factors is discussed with the sensitivity analyses.

5.1.1 Base case scenario: Figure 4 shows two harvest forecast configurations for the base site productivity. The harvest forecasts are shown in tabular form in table 9.

Figure 4: TFL 1 base site productivity harvest forecast

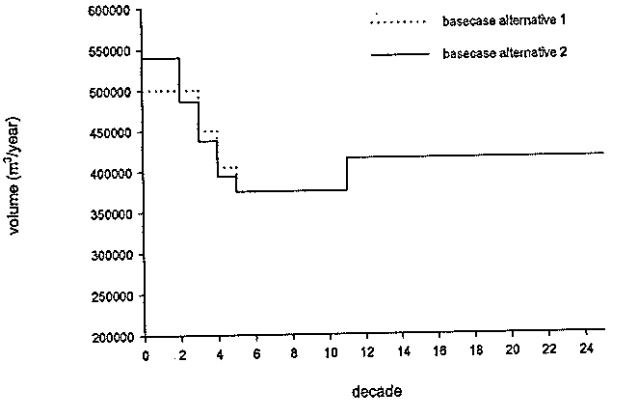


Table 9: Harvest forecasts

Decade	Basecase alternative 1 Annual harvest (m^3)	Basecase alternative 2 Annual harvest (m^3)
1	500,000	540,000
2	500,000	540,000
3	500,000	486,000
4	450,000	437,400
5	405,000	393,700
6	375,000	375,000
7	375,000	375,000
8	375,000	375,000
9	375,000	375,000
10	375,000	375,000
11	375,000	375,000
12	415,000	415,000
13	415,000	415,000
14	415,000	415,000
15	415,000	415,000
16	415,000	415,000
17	415,000	415,000
18	415,000	415,000
19	415,000	415,000

Decade	Basecase alternative 1 Annual harvest (m^3)	Basecase alternative 2 Annual harvest (m^3)
20	415,000	415,000
21	415,000	415,000
22	415,000	415,000
23	415,000	415,000
24	415,000	415,000
25	415,000	415,000
Total	10,415,000	10,457,100

These forecasts show two of several possible forecasts that would meet the specified criteria. Alternative 1 reflects the initial harvest forecasted in the 20 year plan, and is the alternative shown as the base site productivity case for comparison in subsequent runs. The forecast for alternative 2 maximizes the initial harvest that can be maintained for two decades.

The following figure shows the changes in timber growing stock over time for the basecase alternative 1 forecast in the previous figure. This graph shows that the total timber growing stock declines rapidly over the first six decades as the available existing mature stands are harvested and replaced with younger stands. After six decades, the growing stock on average is maintained at an even level, implying that harvesting is consistent with the productive capability of the land. The total growing stock and merchantable growing stock are very similar for the basecase alternative 2 harvest forecast.

Figure 5: Changes in growing stock over time: base site productivity harvest forecast

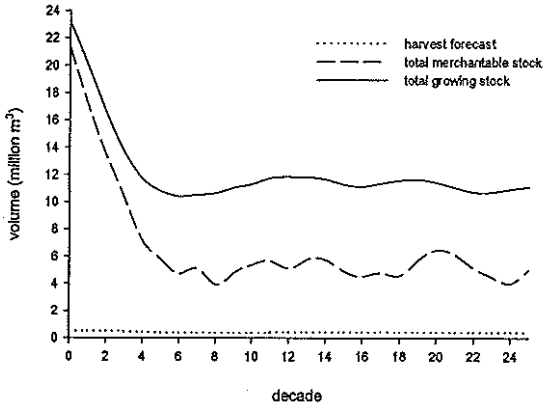


Figure 6 shows the change in annual harvest area over the next 250 years for the basecase alternative 1 harvest forecast.

Figure 6: Area harvested over time: base site productivity harvest forecast

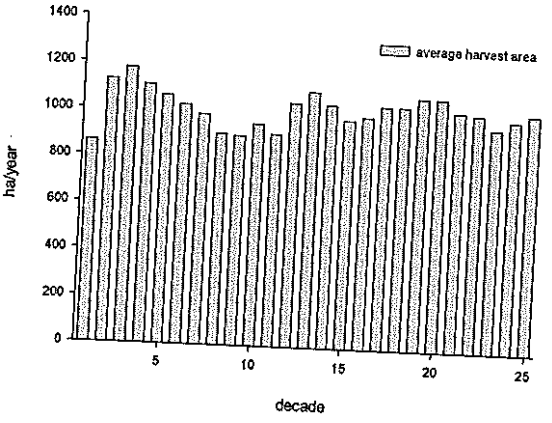


Figure 7 shows the average timber volume per hectare over the same period for the same harvest forecast.

Figure 7: Average volume per hectare harvested: base site productivity harvest forecast

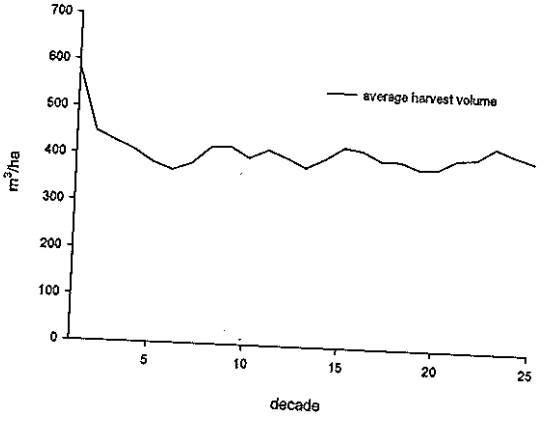


Figure 8 shows the average harvested age over time for the same harvest forecast. Average age is calculated using midpoints of the 10 year age classes, except for stands greater than 250 years, which are assumed to be 300 years old for these calculations.

Figure 8: **Average harvested age: base site productivity harvest forecast**

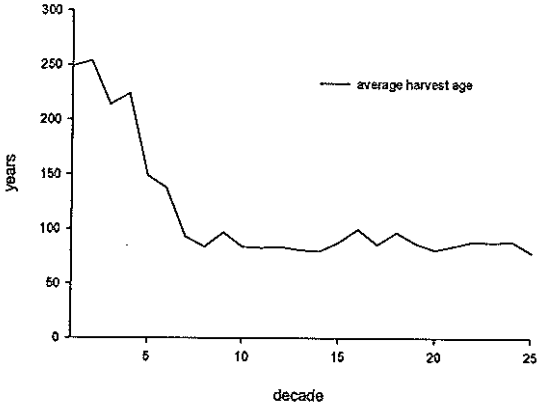


Figure 9: **Harvested age class distribution: base site productivity harvest forecast**

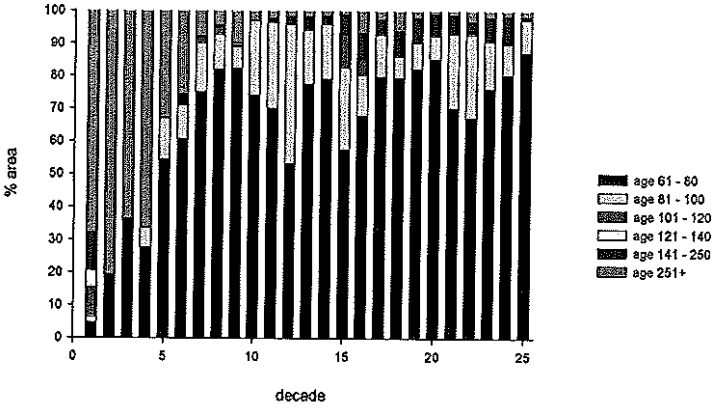
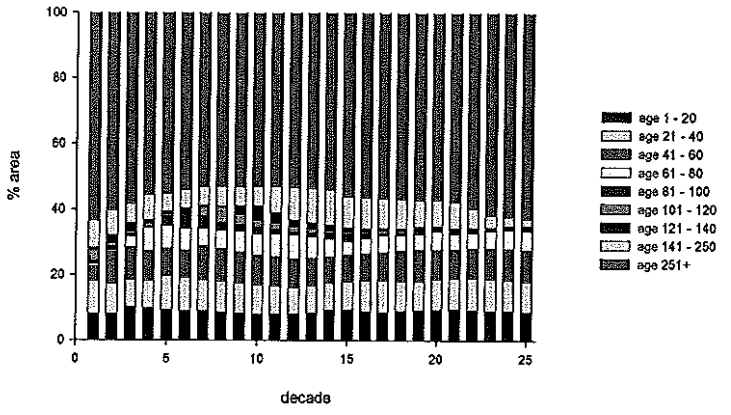


Figure 10 shows the inventory age class distribution over time for the productive forest land base, for the same harvest forecast.

Figure 10: Inventory age class distribution: base site productivity harvest forecast



Landscape level biodiversity constraints are described in section 4.1, and in further detail in the Information Package. A selection of the old seral requirements by landscape unit are shown in the following table, with actual %old seral over time shown in the following figures for the base site productivity harvest forecast. All constraint groups with biodiversity emphasis=high are shown, as well as a selection with biodiversity emphasis=intermediate. In the TREEFARM model, when a landscape unit-constraint group starts with at least the minimum old seral requirement, the constraint is never violated. Where a landscape unit-constraint group does not have the minimum old seral area to start, the old seral requirement is met as soon as possible so that eventually these constaints are met. Two examples are shown below where the old seral area requirements are not currently met, although one of these requirements is met in the first decade.

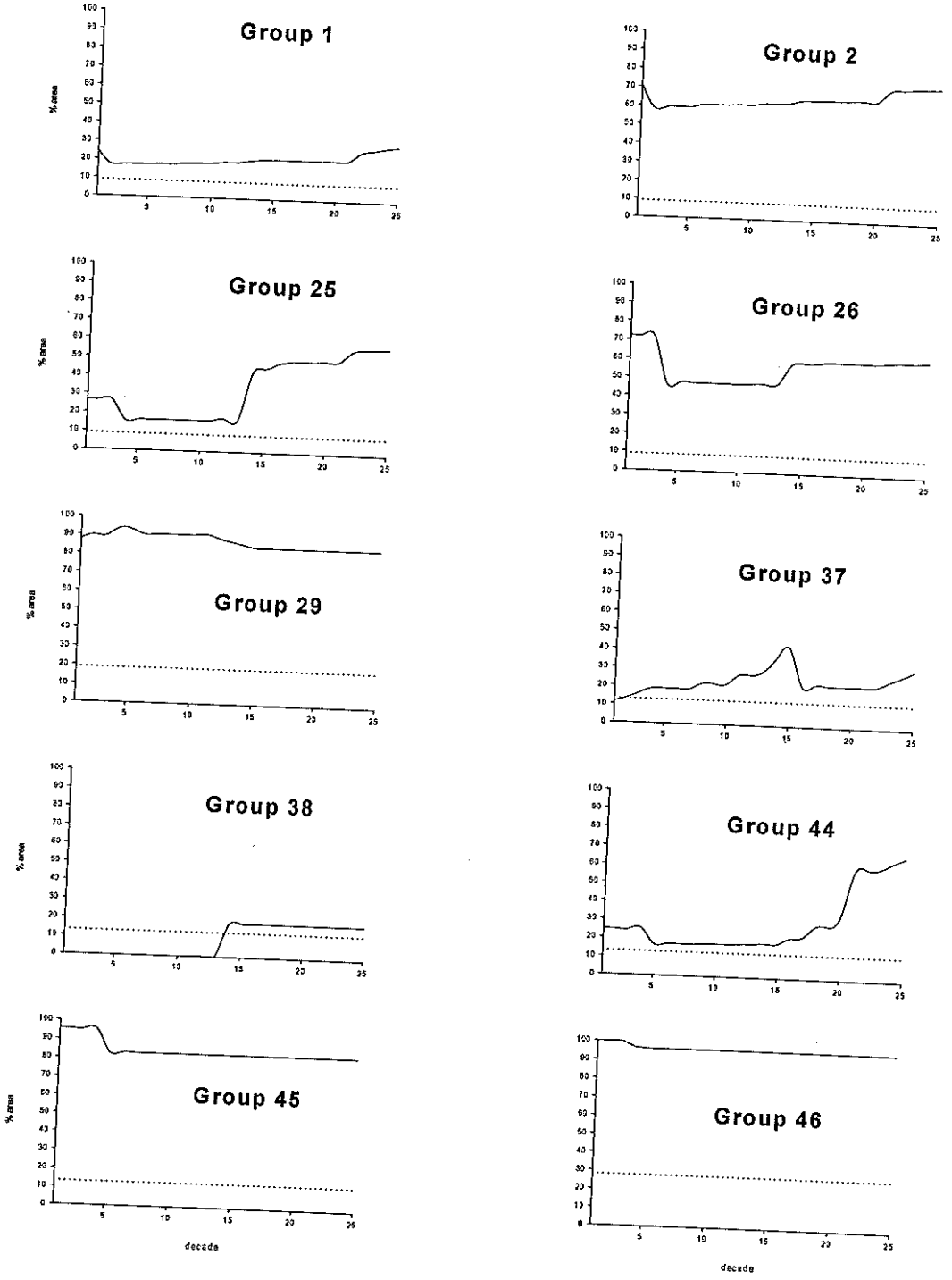
Table #: Selected old seral stage constraints

Constraint group	Landscape Unit	Zone	Subzone	Variant	NDT	BEO	min retention area %
1	Beaver	CWH	ws	1	2	I	9
2	Beaver	CWH	ws	2	2	I	9
25	Kleanza-Treasure	CWH	ws	1	2	I	9
26	Kleanza-Treasure	CWH	ws	2	2	I	9
29	Kleanza-Treasure	MH	mm	2	1	I	19
37	Nass River Kalum	ICH	mc	1	2	H	13
38	Nass River Kalum	ICH	mc	2	2	H	13
44	Skeena River Kalum	CWH	ws	1	2	H	13
45	Skeena River Kalum	CWH	ws	2	2	H	13
46	Skeena River Kalum	MH	mm	2	1	H	28

Figure 11: **Old seral stage percentages: base site productivity harvest forecast**

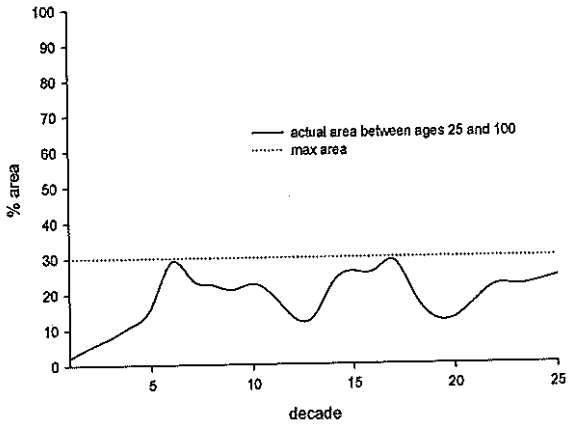
..... min old seral

___actual old seral



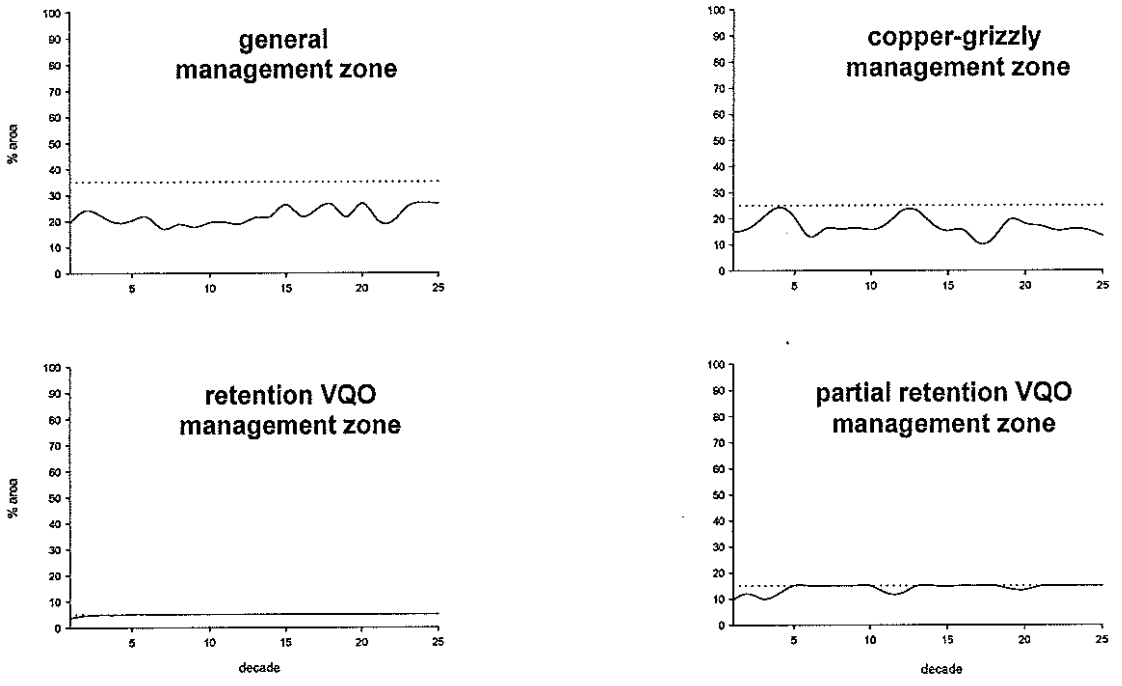
The forest cover constraint for grizzly bear in the Copper Watershed is a maximum of 30% of the productive forest landbase between the ages of 25 and 100 years, as defined in the LRMP. This constraint is met as shown in the following graph.

Figure 12: Copper-grizzly forest cover constraint: base site productivity harvest forecast



Green-up constraints are described in section 4.1, and in further detail in the Information Package. The following graphs show the maximum and actual green up percentages over time for the base site productivity harvest forecast, and show that none of the green up constraints are violated.

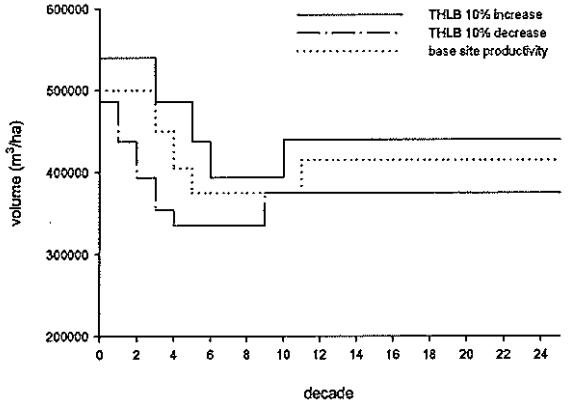
Figure 13: Green up percentages: base site productivity harvest forecast
..... max area below green up height
___actual area below green up height



5.1.2 THLB increase or decrease

These runs use base case yields and assumptions. THLB is increased and decreased by 10% to show the potential impacts of uncertainty in the THLB. This area adjustment is made proportionately to all stand types and ages within the THLB. For THLB increases, the additional area is assumed to come from productive areas, primarily inoperable, netted out in the landbase determination. For THLB decreases, the area removed from the THLB is assumed to contribute to old growth forest cover requirements.

Figure 14: THLB increase and decrease harvest forecasts

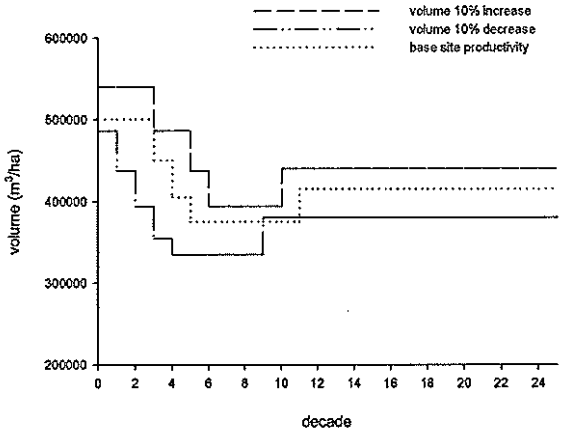


The graph shows that a 10% increase in the THLB allows an 8% increase in initial harvest that can be maintained for three decades, and a 6% increase in the long term harvest level. The 10% THLB decrease results in a lower initial harvest, an immediate step down to a lowest harvest forecast that is 11% lower than the base scenario, followed by a 10% lower long range harvest level.

5.1.3 Volume increase or decrease

These runs show the effects on the base case site productivity forecasts of an overestimate or underestimate of volumes by 10%. The volume adjustments are applied to both the existing and the managed stand yields by use of a utilization factor in the model. Forecasts are very similar to the THLB increase and decrease forecasts.

Figure 15: Volume increase and decrease harvest forecasts



5.2 SCENARIO II: VRI ADJUSTED INVENTORY, SITE PRODUCTIVITY ADJUSTMENT

Existing stand productivity and yields are consistent for all runs. The effects of managed stand productivity and yields are compared to the base site productivity scenario with the following old growth site index adjustment assumptions:

- no OGSI adjustment
- 5m SI adjustment AUs 4 & 5
- 10m SI adjustment AUs 4 & 5
- veteran study SI adjustment

Site productivity and the scenario assumptions are described further in section 3.4. The following graph shows harvest forecasts for the site productivity analyses.

Figure 16: Managed stand site index adjustment harvest forecasts

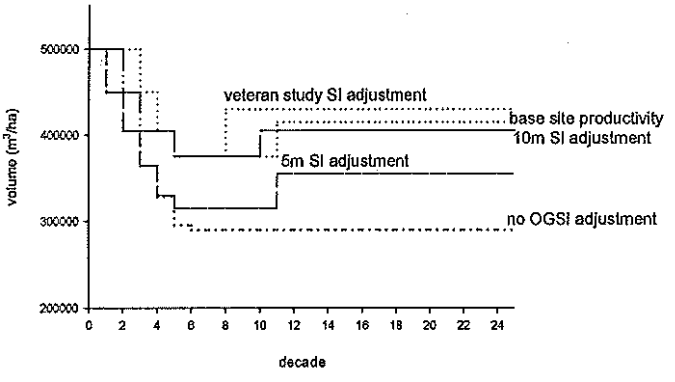


Figure 16 shows that forecasts of future long term productivity are very sensitive to assumptions about site index adjustments. Depending on the assumptions made, long term productivity forecasts range from about 300,000 – 420,000 cubic metres per year.

5.3 SCENARIO III: UNADJUSTED ATTRIBUTES HARVEST FORECASTS

As described in section 2 , age, height, and site index attribute adjustment was done for a portion of the TFL 1 second growth per the described VRI project.

This scenario shows the effects on the harvest forecasts of using the pre-VRI adjusted inventory for the same landbase. The major differences for this scenario are:

- the analysis units have different weighted average site index, which are shown in the information package table 20. Both existing and managed stand yields are based on the unadjusted site index.
- area distribution by 10 year age class in the model input is based on unadjusted age.

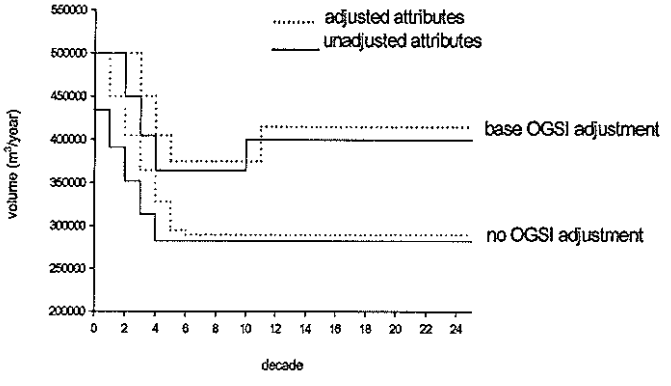
For this landbase, there were no required changes to analysis units based on age or site index, and there were no additional low site areas in the netdown.

Two runs were done with the unadjusted attribute inventory:

- a run that is comparable to the base case site productivity option, with the equivalent old growth site index adjustment for AUs 4,5,14,15;
- a run that is equivalent to the adjusted inventory with no site index adjustment.

The following figure shows the harvest forecasts for these runs with the comparable runs for the adjusted attributes .

Figure 17: Unadjusted attributes harvest forecasts



The use of unadjusted inventory attributes results in:

- a stepdown harvest level one decade earlier when OGSI adjustments are applied.
- a 3.6% decrease in the long term harvest forecast when OGSI adjustments are applied.
- a 13% lower initial harvest rate when OGSI adjustments are not applied. This difference is due partly to the limitation of maximum 10% decrease in harvest rate per decade.
- a 2.5% decrease in the long term harvest forecast when OGSI adjustments are not applied.

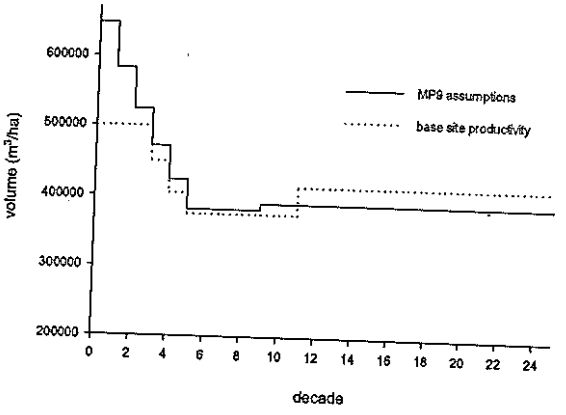
5.4 SCENARIO IV: CURRENT LANDBASE WITH MP9 ASSUMPTIONS, YIELDS, AND OPERABILITY

The Management Plan 9 basecase scenario was run in 2000 with the Nisgaa landbase removed. This scenario approximates the current landbase with pre-VRI adjustment attributes. The 1999 base case had 10m OGSI adjustment for coastal hemlock leading stands, AUs 4 and 5.

The major difference with this scenario and the current base scenario is the greater THLB in 1999 associated primarily with the operability classification at that time.

A comparison of harvest forecasts is shown in the following graph.

Figure 18: Management Plan 9 comparable harvest forecast



This graph shows that after two decades, the harvest forecast for the current landbase with MP 10 assumptions is within 95% of the harvest forecast for the same landbase with MP 9 assumptions. Harvest levels in the first two decades are lower in the current MP10 base case. This is due to the reduced estimates of the operable land base that were were made for MP10.

5.4.1 Recommended Harvest Level

From the results of the timber supply analysis base case scenario and the results of the 20 year plan spatial analysis, we recommend that the harvest level for TFL1 be set at 500,000 cubic metres per year for the next five years.

Appendix 1

TFL 1 VRI Inventory Attribute Adjustment