Western Forest Products Inc.

Tree Farm Licence 39

Timber Supply Analysis

MANAGEMENT PLAN 9

Version 2

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REGISTERED PROFESSIONAL FORESTER
PROVINCE OF BRITISH COLUMBIA
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Timber Supply Analysis Addendums

Two addendums to the Timber Supply Analysis were completed and considered by the Chief Forester in determining the AAC for TFL 39.

- The first addendum (August 2104) indicated the results of modelling the AAC recommended by WFP.
- The second addendum (July 2015) indicated the results of modelling the objectives of the proposed Great Bear Rainforest Order.

For completeness, these addendums have been added to this document.

Maps associated with Chief Forester Established Partitions

On August 29, 2016 the Chief Forester of British Columbia set the AAC for TFL 39 at 1,416,300 m^3. Within this total three partitions were specified as per *Forest Act* section 8(5)(a):

- 1,375,000 m^3 attributable to the combined areas of Block 1 (Powell River) and Block 2 (Sayward);
- No more than 1,203,000 m^3 attributable to the conventionally operable land base within the combined areas of Blocks 1 and 2 (i.e. 1.203 million m^3 of the 1.375 million m^3 total attributed to these two blocks)
- 41,300 m^3 attributable to the combined areas of Block 3 (N. Broughton Island) and Block 5 (Phillips)

To indicate where these partitions apply, the following maps have been added to the end of the Timber Supply Analysis document:

- Block 1 Map titled "Tenure & First Nation Territories" - indicates extent of Block 1
- Block 1 Map titled "Operability" – indicates conventionally operable land base of Block 1
- Block 2 Map titled "Tenure & First Nation Territories" - indicates extent of Block 2
- Block 2 Map titled "Operability" – indicates conventionally operable land base of Block 2
- Block 3&5 Map titled "Tenure & First Nation Territories" - indicates extent of Blocks 3 and 5

These maps were available during the review of the Management Plan and Timber Supply Analysis.

Revisions since Version 1

The following revisions were made to Version 1 (July 2013) of the Timber Supply Analysis to create this document.

Corrected typographical errors and formatting issues and updated date on title page and in page headers.
Corrected SLRD impact values in Table 1.
Inserted tables for most harvest schedule charts to ease interpretation.
Differentiated contribution from current old and current mature stands in Base Case harvest schedules (Tables 5, 9, 12, 15, 18; Figures 3, 10, 17, 24, 31).
Added Section 2.2 – Western Red Cedar Projections
Added “new” Appendix A with additional Base Case harvest schedule statistics.
Added footnote in Section 3.1 to explain difference between “current AAC” and “official AAC”.
Revised proposed AAC partitions.

Executive Summary

This timber supply analysis examines timber supply projections for Tree Farm Licence 39 located on northern Vancouver Island, North Broughton Island and the mainland coast. Since the last analysis several land deletions have occurred, reducing the total area of the TFL from 801,400 hectares to 407,800 hectares. Total productive area is approximately 250,000 ha and the timber harvesting land base is estimated at 171,203 ha.

Woodstock, a pseudo-spatial harvest model, was used to model current management practices for protection and maintenance of ecological values and to estimate the timber supply potential through the year 2261. Several analyses were conducted to test the sensitivity of timber supply to assumptions used in the base analysis.

The results indicate that the timber supply in TFL 39 is robust. Sensitivities with downward pressure on timber supply can maintain the Base Case initial harvest level with little additional impact on mid-term harvest rates compared to alternative schedules where the initial harvest level was allowed to be reduced.

WFP recommends an AAC of 1,629,000 m^3/year, including partitions of 202,000 m^3/year from Block 4 and 45,000 m^3/year from Blocks 3 and 5 combined.

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1.0 Introduction

1.1 Background

Tree Farm Licence (TFL) 39 is comprised of 5 separate supply blocks dispersed along the British Columbian coast and is managed by Western Forest Products Inc. (WFP). Figure 1 indicates the current extent of TFL 39 for this analysis. Since the last analysis several land deletions have occurred (see the Information Package for further details):

- private lands were removed in 2004;
- between 2006 and 2008 several conservancies were removed;
- in 2009 portions were deleted due to the *Forest Revitalization* Act to form part of the Pacific Timber Supply Area;
- in 2010, the TFL was subdivided by deleting Block 6 on Haida Gwaii (Queen Charlotte Islands) to create TFL 60;
- in 2010, a portion of Block 4 was deleted to create a community forest on northern Vancouver Island; and finally,
- in 2012, a portion of Block 1 was deleted to create a tenure for the Sliammon First Nation.

The TFL encompasses 407,800 ha of which 171,203 ha (42%) is estimated to be available for timber production (timber harvesting land base (THLB)). The allowable annual cut (AAC) for this landbase is currently set at 1,885,980 m^3 per year.

1.2 Objective

The primary objective of this report is to estimate reasonably achievable timber flows for consideration by the Provincial Chief Forester in making the determination of the allowable annual cut for the term of Management Plan #9. More specifically:

1. The management of non-timber values such as fish and wildlife habitat, biodiversity, visual quality, and terrain stability is accounted for. Protection of non-timber values will be satisfied by land base reserves, rate-of-harvest constraints and/or by maintaining a percentage of the land base in older stands.
2. Timber flow is estimated by considering harvestable inventory, growth potential of present and future stands, silvicultural treatments, potential timber losses, and operational and legislative constraints.
3. Impacts of declining timber flow on community stability and employment are to be lessened by keeping rates of decline per decade as low as possible without inducing undue impacts on other values or long-term timber sustainability.

1.3 Timber Supply Model

Timber supply optimizations were completed with Woodstock software developed by Remsoft. Woodstock is a pseudo-spatial supply model and is described in more detail in the associated Information Package (IP) dated October 2012.

The inventory database was current to January 1, 2012 for harvesting depletion and silviculture treatments and assessments. The model was constructed using 50 5-year periods for a total optimization horizon of 250 years. Since AAC's are now effective for up to 10 years, the model was constructed such that harvest volumes over successive pairs of 5-year periods had to be equal (i.e. harvest levels in Periods 1 and 2 had to be equal; harvest levels in Periods 3 and 4 had to be equal; etc.). This report presents results by 10-year intervals.

Analysis units (grouping of forest stands) and associated timber volume yield curve parameters are described in more detail in the associated IP. Volumes were projected to 2014 (mid-year of first 5-year period) for the initial forest conditions to represent the average stand volume for the first 5-year period.

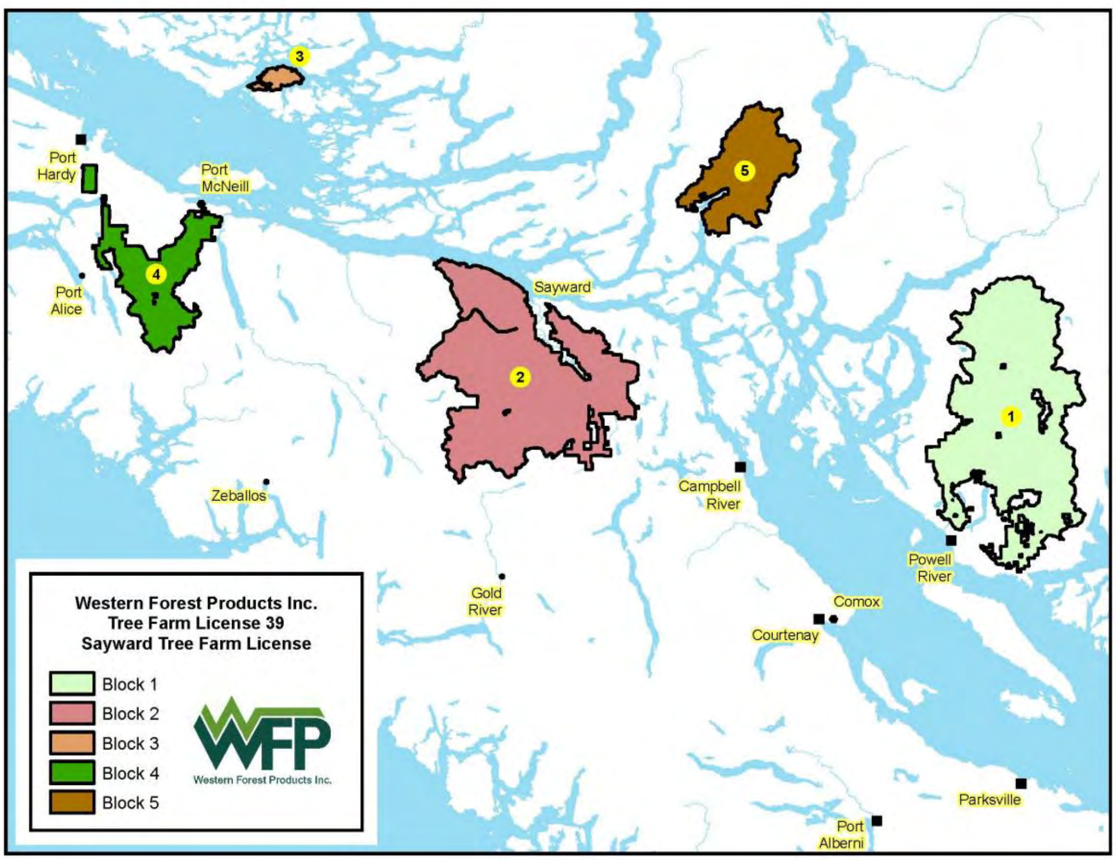

Figure 1 - TFL 39

2.0 Base Case (or Current Management Option)

The Base Case (or Current Management option) includes the following assumptions and modelling parameters that are described in more detail in the associated IP (October 2012):

- Contribution from the operable forested landbase accessible using conventional (ground-based and cable) and non-conventional (long-line and helicopter) systems.
- Exclusion of low volume/poor quality ("uneconomic") mature stands.
- Silviculture to meet free growing requirements is carried out on all regenerated stands. Known tree improvement gains are applied to existing stands < 15 years old and future regenerated stands.
- Visual quality objectives (VQOs) are modelled based on the VQOs established for the Campbell River Forest District on December 14, 2005; VQO's established for Block 1 on June 19, 2009; and recommended visual quality classes in the TFL 39 Block 4 Visual Landscape Inventory. Constraints were applied to individual VQO polygons within Blocks 3, 4 and 5. Due to the number of VQO polygons in Blocks 1 and 2, they were grouped by class within each watershed. Applying constraints to individual VQO polygons resulted in models taking days to solve while grouping allowed models to be solved generally in less than 3 hours. A solution was generated with the disturbance limits applied to individual VQO polygons rather than the aggregated polygons and there was no material difference in harvest volumes achieved. This indicates that the aggregation of the VQO polygons had no significant impact on timber supply results.
- Green-up heights for cutblock adjacency within Block 2 and 4 are assigned based on Resource Management Zones established in the *Vancouver Island Higher Level Plan*. Special and General zones have a 3m green-up requirement while Enhanced zones have a 1.3m green-up height. For all of Block 1, the height is 3m. Where the green-up height is 3m, polygons within 100 metres of cutblocks harvested within the past 5 years were "locked" in the model such that they were not available for scheduling in the first 10 years and polygons within 100 metres of cutblocks harvested 5 - 10 years ago were "locked" in the model such that they were not available for scheduling in the first 5 years.
- Future Wildlife Tree and other stand-level retention are accounted for by a percentage area reduction. Areas designated as stand retention for existing cutblocks were "locked" in the model such that they were unavailable for scheduling until they could be combined with previously harvested polygons to form at least 5 hectares of harvest area. The intention of this approach was to model that current stand-level retention will remain until the next rotation. This "lock" superseded the green-up "lock" where both could apply.
- Biodiversity and Landscape Units – Established and draft Old Growth Management Areas (OGMAs) are removed from the THLB. For landscape units with a Low BEO where the OGMAs have to some extent utilized the 2/3 drawdown permissible in the *Order Establishing Provincial Non-Spatial Old Growth Objectives* effective June 30, 2004 (NSOG), long-term old forest targets are modelled aspatially. Mature seral targets are incorporated for the Special Management Zone within Block 2.

- Established Ungulate Winter Ranges (UWRs) and Wildlife Habitat Areas (WHAs) are removed from the THLB. As per the accepted IP, no additional netdown is assumed for full implementation (potential future WHAs) of the *Identified Wildlife Management Strategy* (IWMS).
- Riparian management netdowns are based on FSP results/strategies and results of a review of riparian management zone retention for a sample of cutblocks harvested between 2000 and 2008.
- Relevant land use objectives from the *South Central Coast Order* (SCCO, March 2009) for Ecosystem Based Management (EBM) within Blocks 3 and 5 are modelled.
- Minimum harvest criteria that vary by harvest system are based on minimum volume per hectare and average stand diameter-at-breast-height (DBH). Both minimum diameter and minimum volume requirements had to be met before a stand could be harvested.
- Harvesting is a mix of old and second growth beginning in the first decade.
- Future harvest level decline is limited to 10% per decade.
- Woodstock was set up to maximize harvest volume over the entire 250-year analysis period subject to maintaining a relatively stable conventionally operable growing stock on the THLB over the final 100 years. This growing stock constraint was not applied to the non-conventional operable growing stock due to the harvest volume constraint applied to that portion of the landbase.

While conducting the analysis on Blocks 3 and 5, logic errors were identified in the database used to develop the THLB spatial data. In error, partial netdowns (e.g. netdowns for red and blue listed ecosystem and terrain stability) were not properly accounted for. This error cascaded through all values below red and blue listed ecosystems in the tables, mainly impacting the incremental impact of the Strategic Level Reserve Design (SLRD). This error resulted in a modest understatement of the THLB values for Blocks 3 and 5 in the Information Package.

Table 1, Table 2 and Table 3 provide updates to Table 6, Table 7, and Table 8 of the Information Package respectively. Block 3 THLB increased by 110 ha and 56,100 m^3 while Block 5 THLB increased by 297 ha and 130,900 m^3.

Table 1 – Corrected Land Base Netdown (ha)

Classification	Block 1	Block 2	Block 3	Block 4	Block 5	Total	% Total	% PFLB
Total Land Base	**153,918**	**156,205**	**4,464**	**46,772**	**46,441**	**407,800**	**100.0%**	
Less Non-forest	33,995	4,792	120	3,374	12,495	54,776	13.4%	
Less Existing Roads	1,407	4,393	161	1,337	263	7,561	1.9%	
Total Forested	**118,516**	**147,020**	**4,183**	**42,061**	**33,683**	**345,463**	**84.7%**	
Less Non-productive	49,412	19,079	67	7,739	19,407	95,704	23.5%	
Total Productive	**69,104**	**127,941**	**4,116**	**34,322**	**14,276**	**249,759**	**61.2%**	**100.0%**
Less Inoperable	3,646	5,693	47	372	1,736	11,494	2.8%	4.6%
Less Plutonic R/W	747	0	0	0	0	747	0.2%	0.3%
Total Operable	**64,711**	**122,248**	**4,069**	**33,950**	**12,540**	**237,518**	**58.2%**	**95.1%**
Reductions:								
Riparian Management	4,628	9,398	608	3,324	1,432	19,390	4.8%	7.8%
Ungulate Winter Ranges	848	4,313	0	358	832	6,351	1.6%	2.5%
Old Growth Management Areas (established)	4,977	8,120	0	889	0	13,986	3.4%	5.6%
Old Growth Management Areas (draft)	87	0	0	587	0	674	0.2%	0.2%
Wildlife Habitat Areas	70	1	0	0	6	77	0.0%	0.0%
High Value Bear Habitat	0	0	0	0	550	550	0.1%	0.2%
Uneconomic	609	989	145	409	851	3,003	0.7%	1.2%
Recreation	11	531	0	6	31	579	0.1%	0.2%
Red/Blue listed ecosystems	0	0	265	0	1,293	1,558	0.4%	0.6%
Terrain Stability	2,892	2,837	46	1,304	931	8,010	2.0%	3.2%
Avalanche Areas	87	26	0	19	8	140	0.0%	0.1%
Strategic Level Reserve Design	0	0	520	0	3,082	3,602	0.9%	1.4%
Total Operable Reductions	**14,209**	**26,217**	**1,584**	**6,896**	**9,016**	**57,922**	**14.2%**	**23.2%**
Reduced Land base	**50,501**	**96,031**	**2,485**	**27,054**	**3,524**	**179,596**	**44.0%**	**71.9%**
Less allowance for stand-level retention	2,468	4,365	149	1,200	211	8,393	2.1%	3.4%
Current THLB	**48,033**	**91,666**	**2,336**	**25,854**	**3,313**	**171,203**	**42.0%**	**68.5%**
Less future roads	214	1,521	59	72	12	1,879	0.5%	0.8%
Long-term Land base	**47,819**	**90,145**	**2,277**	**25,782**	**3,301**	**169,325**	**41.5%**	**67.8%**

Table 2 – Corrected Timber Volume[1] Netdown ('000 m^3)

Classification	Block 1	Block 2	Block 3	Block 4	Block 5	Total	% Total
Total Land Base	**32,536.7**	**50,891.2**	**1,580.8**	**12,208.2**	**6,950.1**	**104,369.7**	**100.0%**
Less Non-forest	0	0	0	0	0	0	0.0%
Less Existing Roads	0	0	0	0	0	0	0.0%
Total Forested	**32,536.7**	**50,891.2**	**1,580.8**	**12,208.2**	**6,950.1**	**104,369.7**	**100.0%**
Less Non-productive	0	0	0	0	0	0	0.0%
Total Productive	**32,536.7**	**50,891.2**	**1,580.8**	**12,208.2**	**6,950.1**	**104,369.7**	**100.0%**
Less Inoperable	2,455.8	3,599.0	20.1	264.2	1,125.0	7,460.0	7.1%
Less Plutonic R/W	265.5	0	0	0	0	266.8	0.3%
Total Operable	**29,815.4**	**47,303.7**	**1,560.7**	**11,944.0**	**5,825.1**	**96,642.9**	**92.6%**
Reductions:							
Riparian Management	2,144.0	4,211.9	301.5	1,320.2	598.9	8,596.8	8.2%
Ungulate Winter Ranges	652.6	3,166.6	0.0	234.5	594.5	4,652.5	4.5%
Old Growth Management Areas (established)	2,791.1	5,177.0	0.0	540.0	0.0	8,517.8	8.2%
Old Growth Management Areas (draft)	48.0	0	0.0	405.8	0.0	454.8	0.4%
Wildlife Habitat Areas	25.1	0.8	0.0	0	0.9	26.8	0.0%
High Value Bear Habitat	0	0	0.0	0	343.0	343.0	0.3%
Uneconomic	193.7	363.2	38.0	113.4	378.1	1,086.5	1.0%
Recreation	8.5	380.0	0.0	2.7	10.6	402.0	0.4%
Red/Blue listed ecosystems	0	0	152.9	0	990.8	1,143.7	1.1%
Terrain Stability	1,538.1	1,493.0	16.6	625.3	500.9	4,179.9	4.0%
Avalanche Areas	225.1	15.5	0.0	8.4	6.8	255.8	0.2%
Strategic Level Reserve Design	0	0	106.3	0	1,437.4	1,543.7	1.5%
Total Operable Reductions	**7,626.2**	**14,808.0**	**615.3**	**3,250.3**	**4,861.9**	**31,203.3**	**29.9%**
Reduced Land base	**22,189.2**	**32,495.7**	**945.4**	**8,693.7**	**907.4**	**65,439.6**	**62.7%**
Less allowance for stand-level retention	842.3	1,430.1	56.7	376.7	54.5	2,771.5	2.7%
Current THLB	**21,346.9**	**31,065.6**	**888.7**	**8,317.0**	**852.9**	**62,668.1**	**60.0%**

[1] Data updated to the December 31, 2011 for logging and ages; therefore, volumes listed represent estimates at the end of 2011.

Table 3 – Corrected Timber Licence (Schedule A) / Crown (Schedule B) THLB Split

TFL Block	THLB (ha)		
	Schedule A	Schedule B	Total
Block 1	112	47,922	48,034
Block 2	12,011	79,655	91,666
Block 3	758	1,578	2,336
Block 4	2,645	23,209	25,854
Block 5	160	3,153	3,313
Total	**15,686**	**155,517**	**171,203**

The Base Case harvest flow is presented in Table 4 and Figure 2. All harvest volume figures are net of non-recoverable losses of one percent per year. Details by supply block follow in Section 2.1.

Table 4 - Base Case Harvest Levels

			Annual Harvest Volume (m^3)					
Period (Decade #)	Start Year	End Year	Block 1	Block 2	Block 4	Blocks 3 & 5	Total	% Change from Previous Period
1	2012	2021	435,300	864,300	197,000	41,300	1,537,900	-18.5 %
2	2022	2031	435,300	777,900	197,000	41,300	1,451,500	-5.6%
3 - 4	2032	2051	435,300	706,100	197,000	41,300	1,379,700	-4.9%
5	2052	2061	435,300	706,100	216,700	41,300	1,399,400	1.4%
6	2062	2071	435,300	756,100	237,300	41,300	1,470,000	5.0%
7	2072	2081	435,300	806,100	237,300	41,300	1,520,000	3.4%
8 - 10	2082	2111	435,300	833,700	237,300	45,000	1,551,300	2.1%
11 - 25	2112	2261	435,300	833,700	249,900	45,000	1,563,900	0.8%

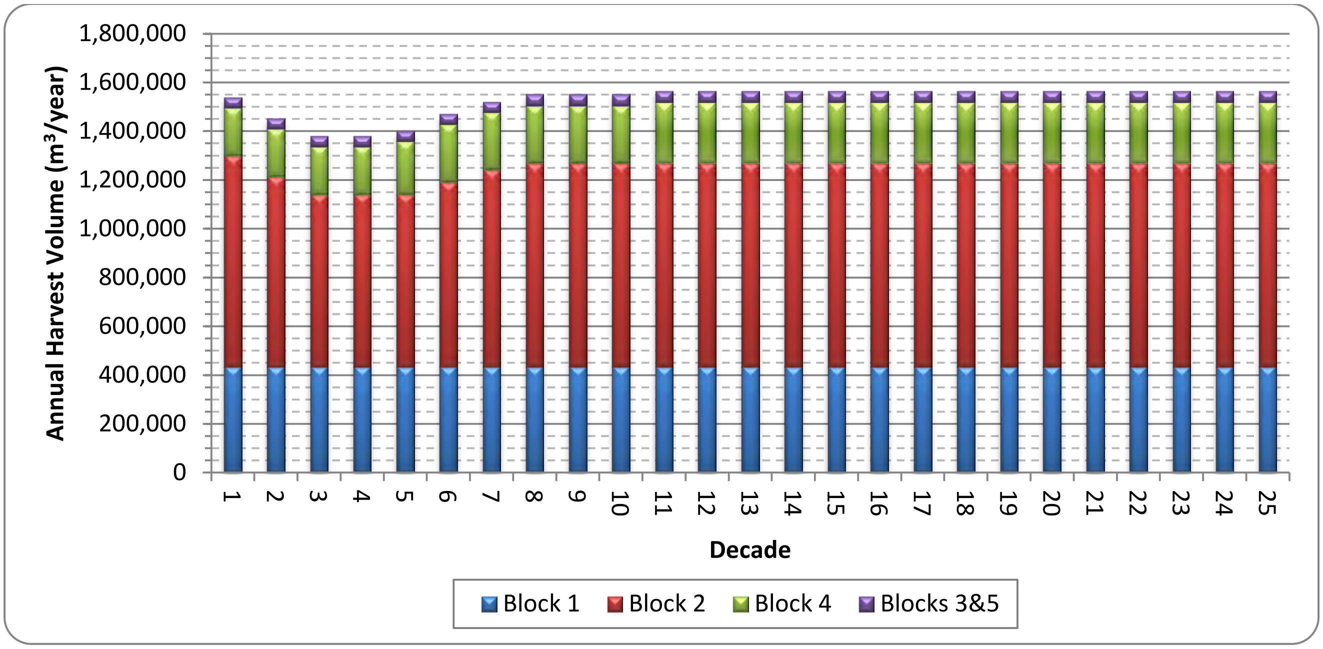

Figure 2 - Base Case Harvest Schedule

The results indicate that an initial harvest level of 1,537,900 m^3/year can be achieved when applying the assumptions and parameters discussed earlier. This is a reduction of 18.5% from the current AAC of 1,885,980 m^3/year. This decline is mainly attributable to EBM impacts within Blocks 3 and 5, limits applied to timber supply contribution from non-conventional operable landbase and reduced old forest availability due to additional landscape reserves (mainly OGMAs and WHAs). Approximately 35,500 m^3/year of the decline is attributable to areas that have been removed from TFL 39 but for which the AAC was not adjusted: Block 7, community forest in Block 4 and woodlots in Block 2.

The projected harvest schedule further declines approximately 10% over the next 20 years to a low of 1,379,700 m^3/year through to 2051 before gradually increasing to the current long-term harvest level (LTHL) estimate of 1,563,900 m^3/year. The mid-term timber supply “dip” occurs during the transition from natural (old and second growth) stands to managed stands with their higher volumes (mainly due to improved stocking and genetic gain values). The total volume harvested over the 250 years is roughly 382.5 million m^3. The schedule resulted in non-conventional harvest levels averaging about 117,000 m^3/year through the 250 years (ranging from 92,500 m^3/year to 131,000 m^3/year in any given decade) with the balance of the volume being conventional harvest.

Table 5 and Figure 3 indicate the contribution to the total harvest volume by period from each of the four stand establishment histories (with current old and current mature differentiated) used to define the analysis units:

- Current old growth defined as stands greater than 250 years old in 2012;
- Current mature defined as 141 - 250 years old in 2012;

- Natural second growth defined as 51 – 140 years old in 2012;
- Current managed second growth defined as 1 – 50 years old in 2012;
- Future stands defined as NSR in 2012 and all modelled future regeneration.

Table 5 - Stand Types' contribution to Base Case harvest

			Annual Harvest Volume (m^3)					
Period (Decade #)	Start Year	End Year	Current Old	Current Mature	Natural Second Growth	Current Managed	Future Stands	Total
1	2012	2021	774,600	98,000	662,900	2,400	0	1,537,900
2	2022	2031	613,600	15,300	682,500	140,100	0	1,451,500
3	2032	2041	249,100	7,300	610,800	512,500	0	1,379,700
4	2042	2051	128,600	700	550,100	698,000	2,300	1,379,700
5	2052	2061	199,700	200	248,400	935,900	15,200	1,399,400
6	2062	2071	109,800	3,300	132,100	1,101,000	123,800	1,470,000
7	2072	2081	120,700	1,900	158,300	912,400	326,700	1,520,000
8	2082	2091	92,400	300	38,300	590,900	829,400	1,551,300
9	2092	2101	68,000	0	15,700	312,300	1,155,30	1,551,300
10	2102	2111	41,000	0	34,700	353,800	1,121,80	1,551,300
11	2112	2121	4,300	0	29,200	206,000	1,324,40	1,563,900
12	2122	2131	14,100	0	38,800	156,200	1,354,80	1,563,900
13	2132	2141	8,900	0	15,700	50,000	1,489,30	1,563,900
14	2142	2151	3,400	0	12,200	22,100	1,526,20	1,563,900
15	2152	2161	5,700	0	18,600	26,600	1,513,00	1,563,900
16	2162	2171	7,400	0	70,700	270,200	1,215,60	1,563,900
17	2172	2181	3,300	0	49,900	27,400	1,483,30	1,563,900
18	2182	2191	3,600	0	9,900	15,500	1,534,90	1,563,900
19	2192	2201	3,400	0	6,900	15,400	1,538,20	1,563,900
20	2202	2211	4,300	0	4,200	11,900	1,543,50	1,563,900
21	2212	2221	800	0	5,100	2,400	1,555,60	1,563,900
22	2222	2231	1,300	0	2,900	7,200	1,552,50	1,563,900
23	2232	2241	600	0	3,400	6,200	1,553,70	1,563,900
24	2242	2251	200	0	2,300	1,400	1,560,00	1,563,900
25	2252	2261	10,800	0	2,700	9,700	1,540,70	1,563,900

Old stands contribute the greatest proportion of volume in the immediate future (first 10 years). In the subsequent 20 years natural second growth provides the largest proportion of the volume as contribution from mature stands declines. Beginning in the fourth decade (2042 – 2051) current managed stands provide the greatest volume and do so for forty years. During this time there is still some old timber harvested. During Decade 16 (2162-2171), approximately 17% of the total harvest is sourced from current managed second growth stands. This volume is mainly cable harvesting on poor sites within Block 2 and 4 that originates from stands that are less than 10 years old in 2012. The minimum harvest criteria make these stands unavailable until they are about 160 years old. Also in Decade 16, approximately two-thirds of the harvest in Blocks 3 and 5 is from cable harvesting within this stand type. This is a result of the model managing mid-seral constraints by site-series surrogate.

Future managed stands contribute some volume beginning in the fourth decade (2042 – 2051) and provide the majority of the harvest volume as of the eighth decade (2082 – 2091).

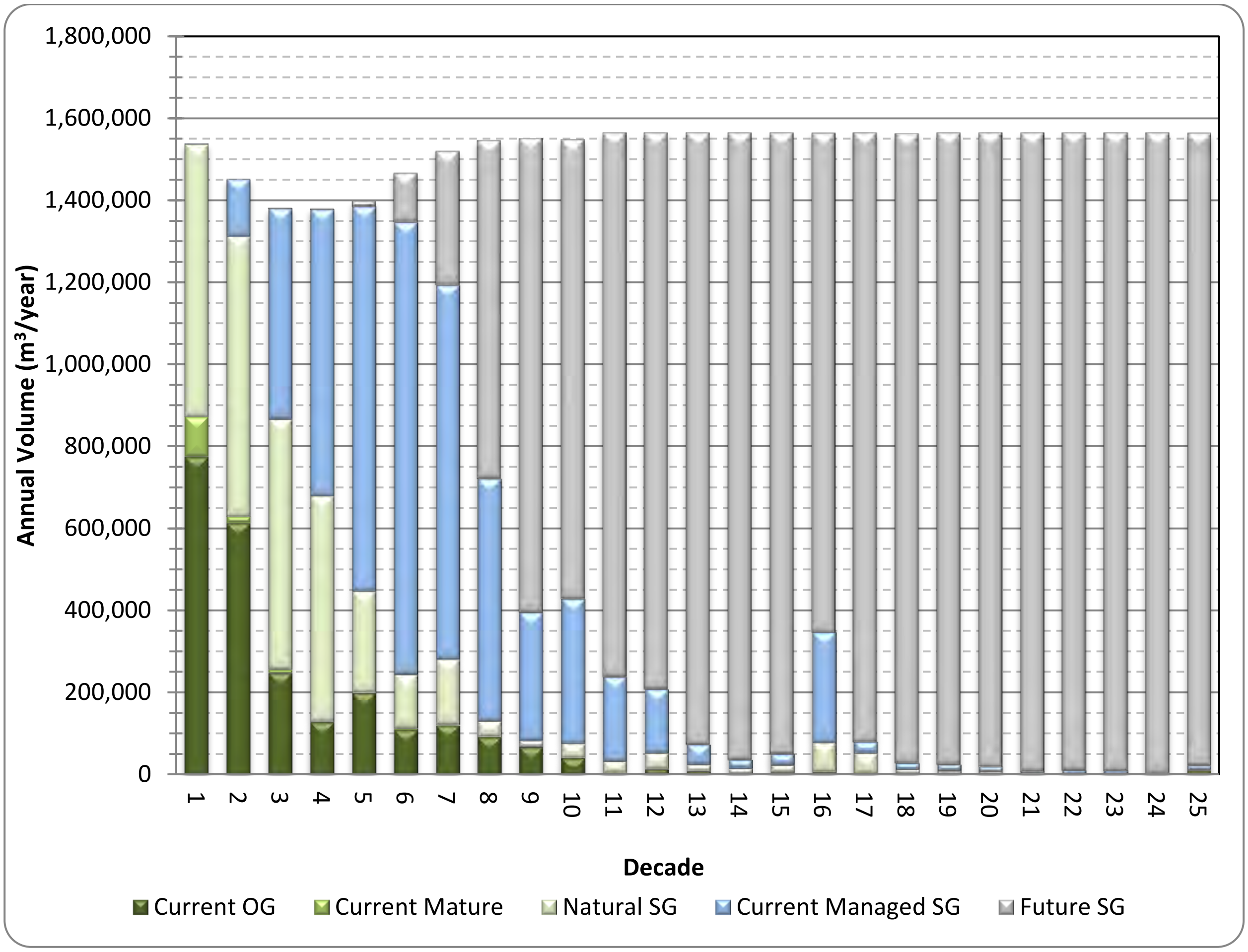

Figure 3 – Stand Types' contribution to Base Case harvest

Age class (as defined in Table 6) distributions over time based on the 5-year age groupings used in Woodstock are examined in Figure 4 and Figure 5. Age class "zero" only exists in the first time period (2012) due to the presence of NSR lands (and stands established in 2010 and 2011) whereas in future time periods the model "regenerates" harvested stands immediately (a 1-year regeneration delay is incorporated in the yield tables). Within the productive forest the oldest age class declines by slightly more than 40% and then increases to slightly more than the current amount as younger reserved timber ages into the old growth age class (see Figure 4). By the year 2262, the entire non-contributing landbase (i.e. all area outside of the THLB) is comprised of old forest as this is 250 years into the future.

Table 6 – Age Classes

Age Class	Age Range (years)
0	0 (NSR)
1	1 - 20
2	21 - 40
3	41 – 60
4	61 – 80
5	81 – 100
6	101 - 120
7	121 – 140
8	141 – 250
9	251+

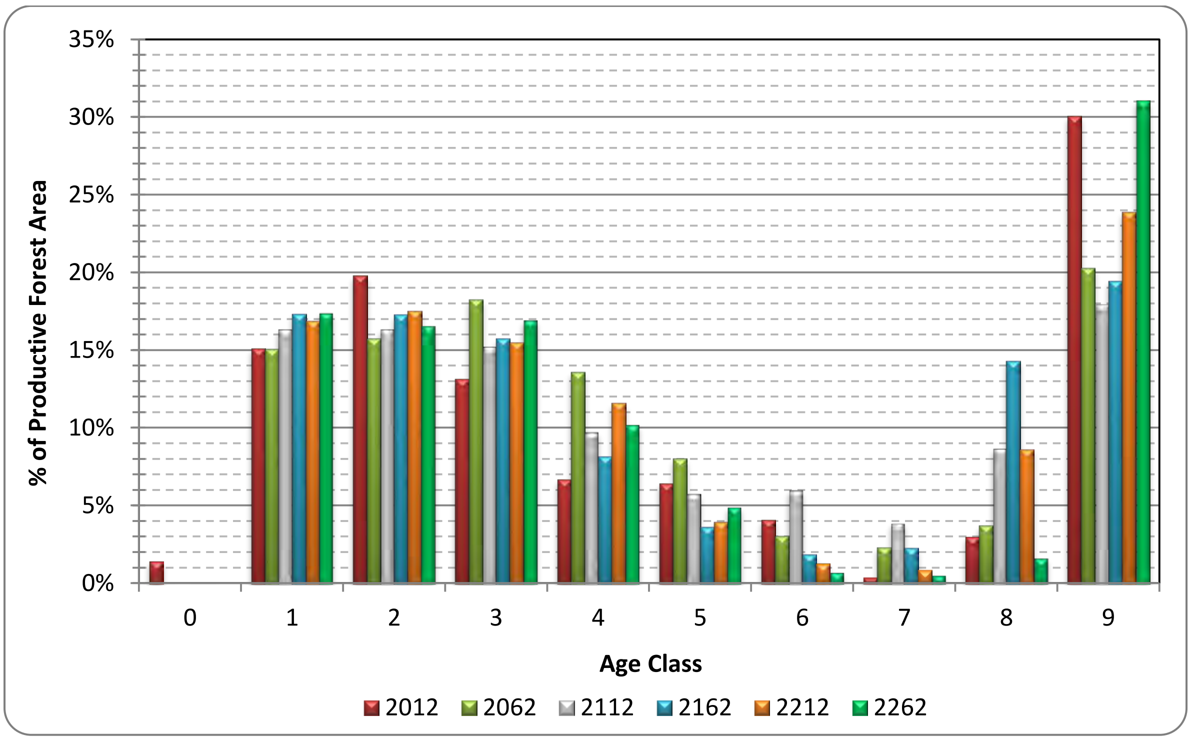

Figure 4 - Age class distribution of productive forest area

The total THLB area in Age Classes 1-4 increases initially until a relatively balanced age class distribution is achieved (refer to Figure 5).

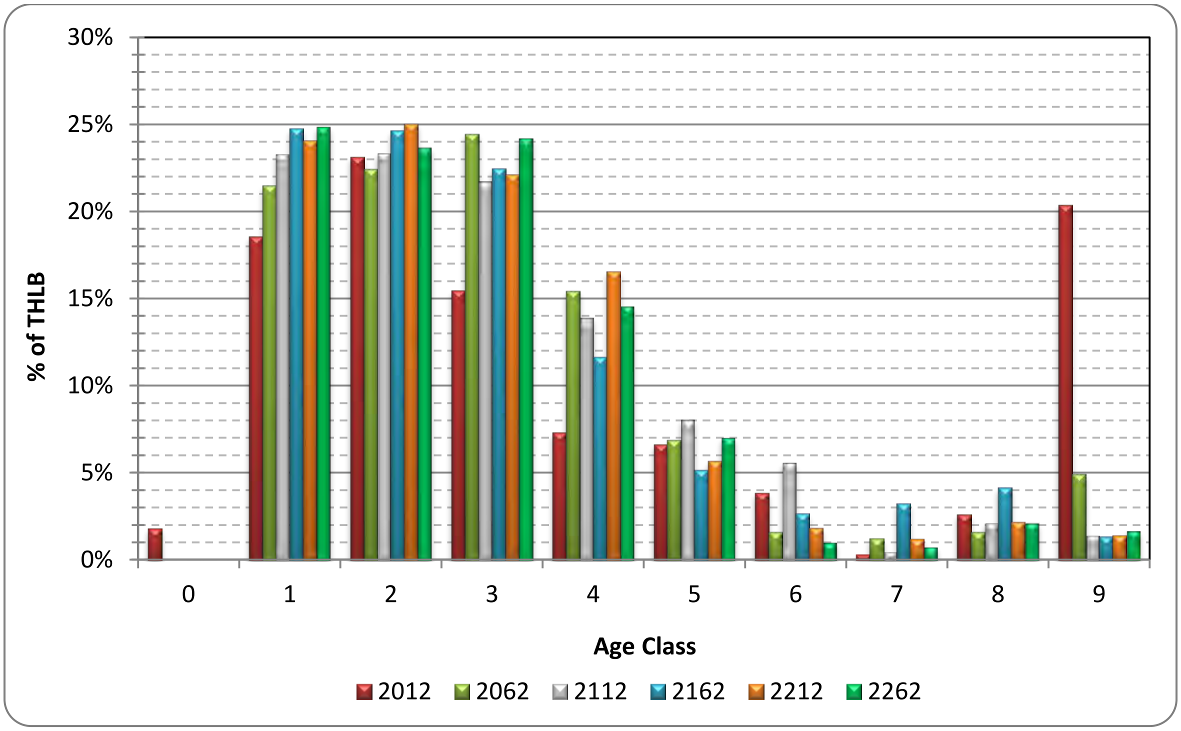

Figure 5 - Age class distribution of timber harvesting land base

Figure 6 illustrates harvestable (i.e. meets minimum harvest criteria) and total growing stock (including the ground-based / cable / non-conventional split) levels for the timber harvesting landbase at the beginning of each decade. Total THLB growing stock declines by about 8% until the transition to second growth harvesting is mostly completed (in third decade) and then returns to near current levels as future stands begin to acquire merchantable volume but harvesting is occurring mainly in existing stands (between fourth and seventh decade). Refer to Figure 3 for the contribution of each stand type to the total harvest level over time.

Once the transition to future stands is mostly completed, total THLB growing stock fluctuates between approximately 60.5 million m^3 and 64 million m^3. Total conventionally-operable growing stock follows a similar pattern, with the long-term growing stock varying between 48.2 million m^3 and 50.1 million m^3. The model constraint applied forced the amount of conventionally-operable growing stock at the end of the analysis period (i.e. start of Decade 26) to be greater than or equal to the amount at the start of Decade 16. More variability is found within the components of the conventionally-operable inventory, ground-based and cable. Non-conventional THLB growing stock declines by roughly 27% over the first 50 years as mainly old growth is harvested and second growth stands are relatively young and therefore not accumulating significant volume. Over the remaining 200 years non-conventional THLB growing stock increases as the rate of growth exceeds the rate of harvest due to the harvest constraint applied to that part of the landbase.

Harvestable volume declines significantly over the first 50 years as old growth and existing second growth stands are harvested and replaced with managed stands. Once the transition to future stands is complete, harvestable volume fluctuates between 20 and 23 million m^3.

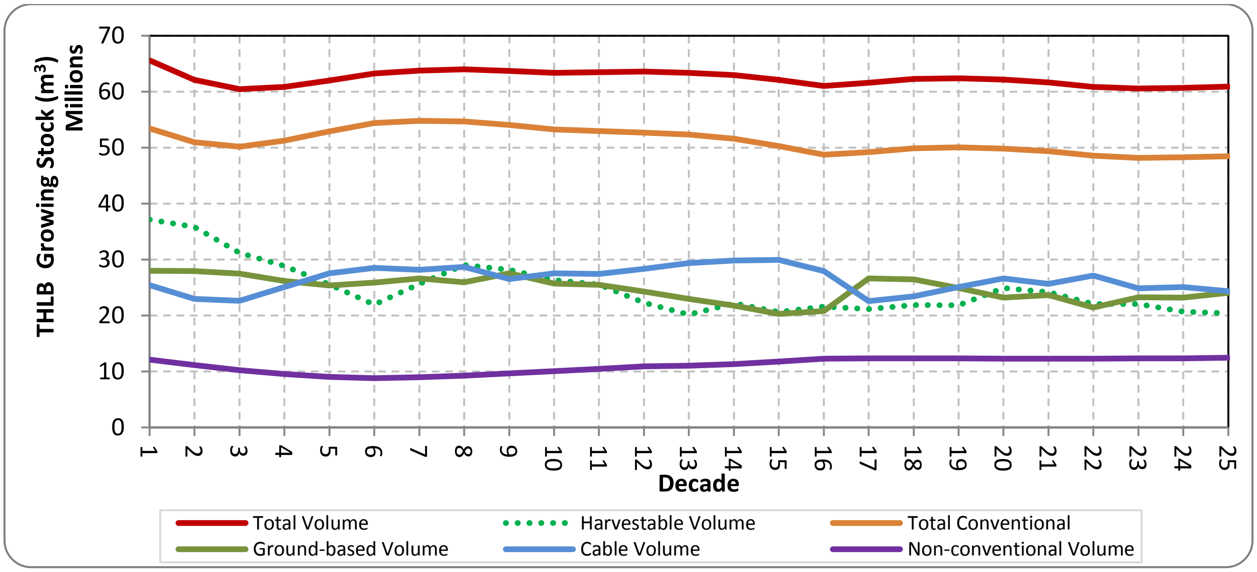

Figure 6 -THLB Growing stock

Figure 7 provides volume-weighted average statistics for timber harvested through the harvest projection. As expected, the mean age of stands harvested declines rapidly as the transition to harvesting of managed stands occurs, dropping from 216 years old in the first decade to 114 years old in the fourth decade (2042-2051). From Decade 5 (2052 – 2061) to Decade 14 (2142 – 2151), the average age slowly declines as the contribution from future managed stands gradually increases. Other than in Decade 16 (2162 – 2171), the average age of second growth (SG) harvested shows relatively little variation: ranging from a low of 75 years in Decade 14 to a high of 92 years in the tenth decade (2102 – 2111). The average age of second growth harvested in Decade 16 (2162 – 2171) is 113 years. This relatively older average is a result of the significant volume sourced from cable harvesting within current managed second growth stands discussed earlier.

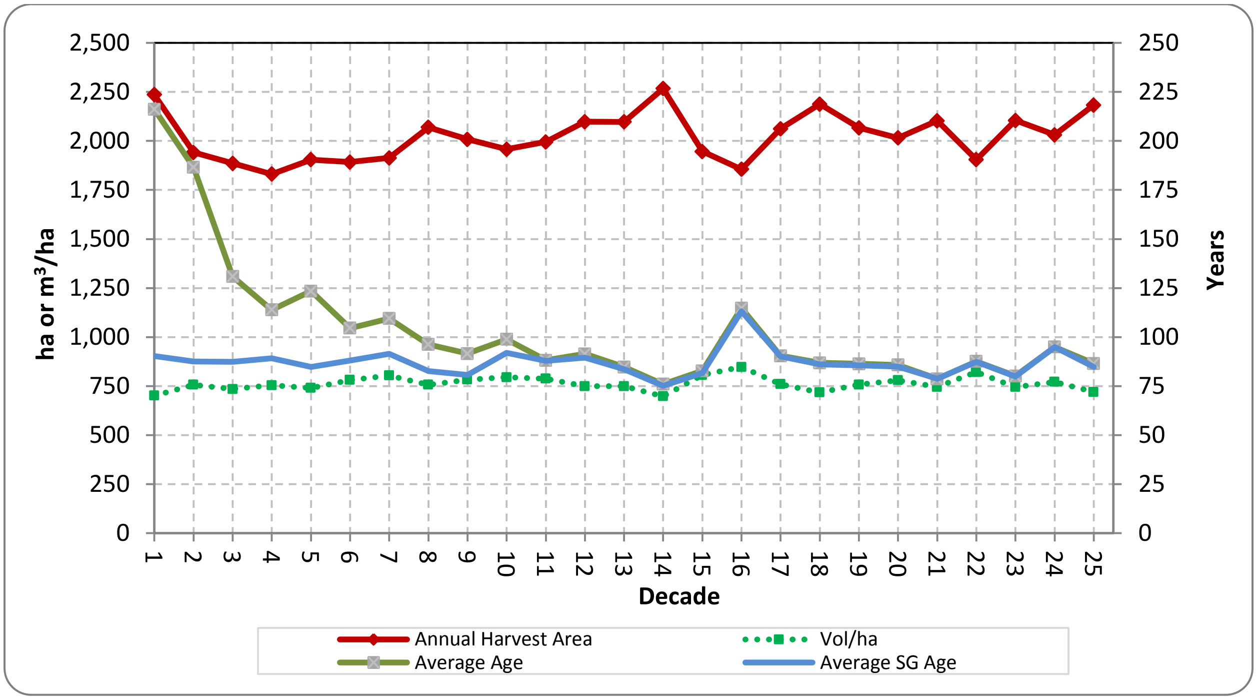

Figure 7 - Harvest Statistics

Annual area harvested declines from 2,236 to 1,831 hectares over the first four decades in conjunction with the decline in harvest volume and increase in the proportion of volume sourced from managed second growth. Once the transition to primarily managed second growth harvesting occurs (fifth decade), annual area harvested generally ranges between 1,900 and 2,200 hectares. Except in Decade 16, merchantable volume per hectare remains reasonably constant at about 750 ± 30 m^3/ha throughout the schedule. In Decade 16 the average volume harvested of 847 m^3/ha is a result of older aged stands being harvested as discussed earlier. The high merchantable volumes harvested in this decade result in a corresponding reduction in area harvested.

The minimum harvest age modelled for stands varied by harvesting system (see Section 11.3.1 of the IP). Figure 8 indicates the contribution by harvesting system to total annual harvest volume and average harvest age. Non-conventional harvest in the first 40 years is maximized at 131,000 m^3/year, is reduced through the mid-term due to a reduction in operable inventory (due to a shortage of older second growth), and in the long-term reaches similar levels as short-term harvest.

Table 7 – Base Case Volume Contribution by Harvesting System

				Annual Harvest Volume (m^3)			
Period (Decade #)	Start Year	End Year	Average Harvest Age (years)	Cable Harvesting	Ground-based Harvesting	Non-conventional Harvesting	Total
1	2012	2021	216	740,200	666,700	131,000	1,537,900
2	2022	2031	187	579,300	741,200	131,000	1,451,500
3	2032	2041	131	393,700	855,000	131,000	1,379,700
4	2042	2051	114	438,000	810,700	131,000	1,379,700
5	2052	2061	123	566,000	716,300	117,100	1,399,400
6	2062	2071	105	662,200	709,900	97,900	1,470,000
7	2072	2081	109	569,800	854,900	95,300	1,520,000
8	2082	2091	96	816,000	639,700	95,600	1,551,300
9	2092	2101	92	513,200	942,700	95,400	1,551,300
10	2102	2111	99	664,700	786,100	100,500	1,551,300
11	2112	2121	88	568,700	895,600	99,600	1,563,900
12	2122	2131	91	560,100	872,800	131,000	1,563,900
13	2132	2141	85	596,100	855,600	112,200	1,563,900
14	2142	2151	76	600,700	870,700	92,500	1,563,900
15	2152	2161	83	782,000	686,900	95,000	1,563,900
16	2162	2171	115	1,118,500	314,400	131,000	1,563,900
17	2172	2181	90	544,400	888,500	131,000	1,563,900
18	2182	2191	87	506,400	926,500	131,000	1,563,900
19	2192	2201	86	529,600	903,300	131,000	1,563,900
20	2202	2211	86	742,300	690,600	131,000	1,563,900
21	2212	2221	79	485,200	947,700	131,000	1,563,900
22	2222	2231	88	850,100	594,200	119,600	1,563,900
23	2232	2241	80	611,700	821,200	131,000	1,563,900
24	2242	2251	95	709,500	734,800	119,600	1,563,900
25	2252	2261	87	615,500	834,100	114,300	1,563,900

As would be expected, once the majority of the volume is sourced from managed stands there is generally a positive relation between the amount of cable harvesting and the average harvest age: as the cable contribution increases, so does the average harvest age. This is due to the substantially older harvest ages on cable-based areas compared to ground-based areas. Of course site quality of the stands harvested is also a factor in determining the average age. The significant cable volume in Decade 16 and the corresponding average harvest age discussed earlier is clearly evident.

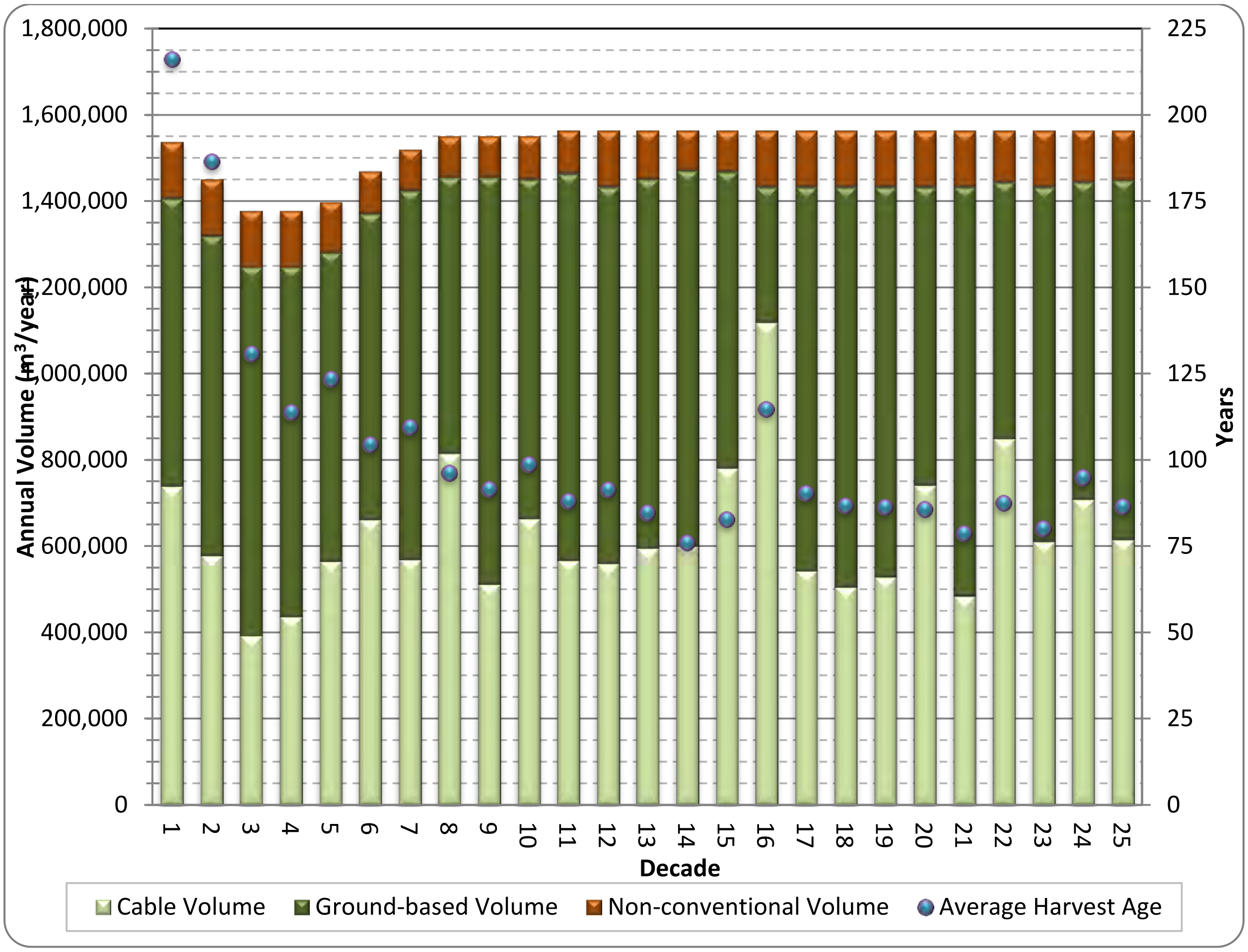

Figure 8 – Base Case Volume Contribution by Harvesting System

2.1 Individual Supply Block Base Case Details

This section provides the same Base Case statistics as in Section 2.0 but by supply block.

2.1.1 Block 1 Base Case Details

Block 1 is located on the Sunshine Coast near the City of Powell River. It includes 34% of the forested area of TFL 39 and 28% of the THLB. Harvesting in Block 1 dates back to the 1890's. That history combined with a history of large forest fires has created an extensive inventory of older second growth timber. As a result, the age class distribution within the block is fairly balanced, creating a stable timber supply (see Table 8 and Figure 9). The current AAC attributed to Block 1 is 408,019 m^3/year.

Table 8 – Block 1 Base Case Harvest Levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3/yr)	% Change from Previous Period
1 - 25	2012	2261	435,300	+ 6.7%

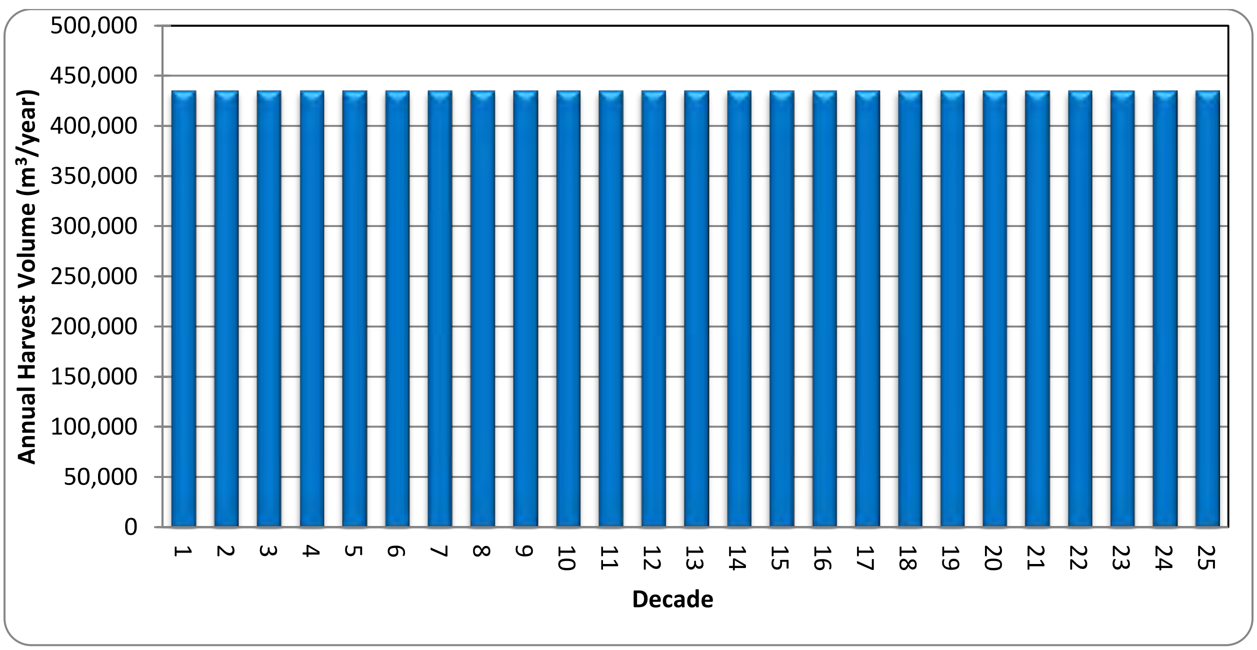

Figure 9 – Block 1 Base Case Harvest Schedule

The Base Case assumptions resulted in a non-declining even harvest flow of 435,300 m^3/year, with 385,300 m^3/year sourced from conventionally-operable landbase and 50,000 m^3/year from non-conventionally operable area (see Figure 15 for a breakdown by harvest system). This is an increase of 6.7% from the current AAC contribution.

Table 9 and Figure 10 indicate the contribution to the total harvest volume by period from each of the stand establishment histories used to define the analysis units. Natural second growth contributes the majority of volume for the first 40 years and significant volume for the next 30 years. Current managed second growth starts contributing in the third decade and provides the bulk of the volume in the fifth, sixth and seventh decades. Beginning in the eight decade, future stands contribute the most volume as the contribution from current managed second growth declines. Mature stand contribution is greatest (20%) in the first 10 years and never exceeds 16% in any other decade.

Table 9 - Stand Types' contribution to Block 1 Base Case harvest

				Annual Harvest Volume (m^3)				
Period (Decade #)	Start Year	End Year	Current Old	Current Mature	Natural Second Growth	Current Managed	Future Stands	Total
1	2012	2021	55,300	31,800	348,200	0	0	435,300
2	2022	2031	65,500	4,200	365,600	0	0	435,300
3	2032	2041	46,000	400	368,700	20,100	100	435,300
4	2042	2051	7,100	400	304,800	122,800	200	435,300
5	2052	2061	68,400	200	113,800	246,300	6,600	435,300
6	2062	2071	31,200	1,100	82,100	221,900	99,000	435,300
7	2072	2081	44,400	1,700	81,100	230,900	77,200	435,300
8	2082	2091	30,100	500	27,000	121,000	256,700	435,300
9	2092	2101	26,100	0	14,100	76,100	319,000	435,300
10	2102	2111	20,400	0	19,800	94,000	301,100	435,300
11	2112	2121	2,200	0	25,900	46,100	361,100	435,300
12	2122	2131	12,000	0	34,000	21,100	368,200	435,300
13	2132	2141	6,800	0	15,300	6,700	406,500	435,300
14	2142	2151	1,300	0	9,600	2,500	421,900	435,300
15	2152	2161	3,600	0	9,100	2,800	419,800	435,300
16	2162	2171	4,400	0	31,700	12,900	386,300	435,300
17	2172	2181	1,200	0	11,800	5,300	417,000	435,300
18	2182	2191	1,500	0	9,000	7,800	417,000	435,300
19	2192	2201	1,300	0	6,000	1,700	426,300	435,300
20	2202	2211	2,200	0	4,200	2,700	426,200	435,300
21	2212	2221	0	0	5,100	1,800	428,400	435,300
22	2222	2231	1,200	0	2,900	2,200	429,000	435,300
23	2232	2241	600	0	3,400	500	430,800	435,300
24	2242	2251	100	0	2,300	400	432,500	435,300
25	2252	2261	900	0	500	4,200	429,700	435,300

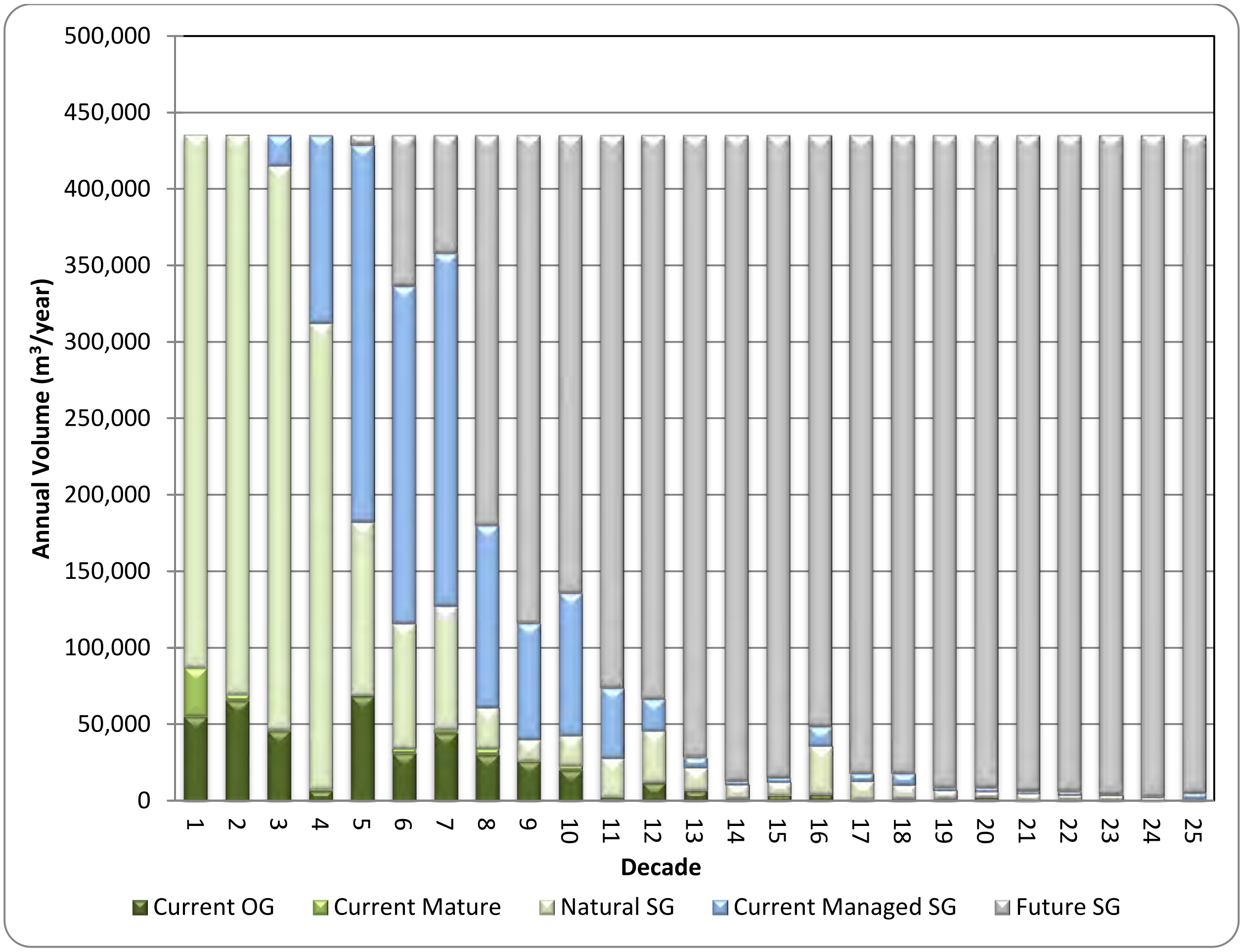

Figure 10 – Stand Types' contribution to Block 1 Base Case harvest

Age class (refer to Table 6) distributions over time based on the 5-year age groupings used in Woodstock are examined in Figure 11 and Figure 12. Age class "zero" only exists in the first time period (2012) due to the presence of NSR lands (and stands established in 2010 and 2011) whereas in future time periods the model "regenerates" harvested stands immediately (a 1-year regeneration delay is incorporated in the yield tables). Within the productive forest the total area in older age classes (5-9) declines by 19% over the first 50 years as old growth and older second growth is harvested. Subsequently the total area in older age classes fluctuates as younger reserved timber ages into the old growth age class and harvesting continues in these age classes (see Figure 11).

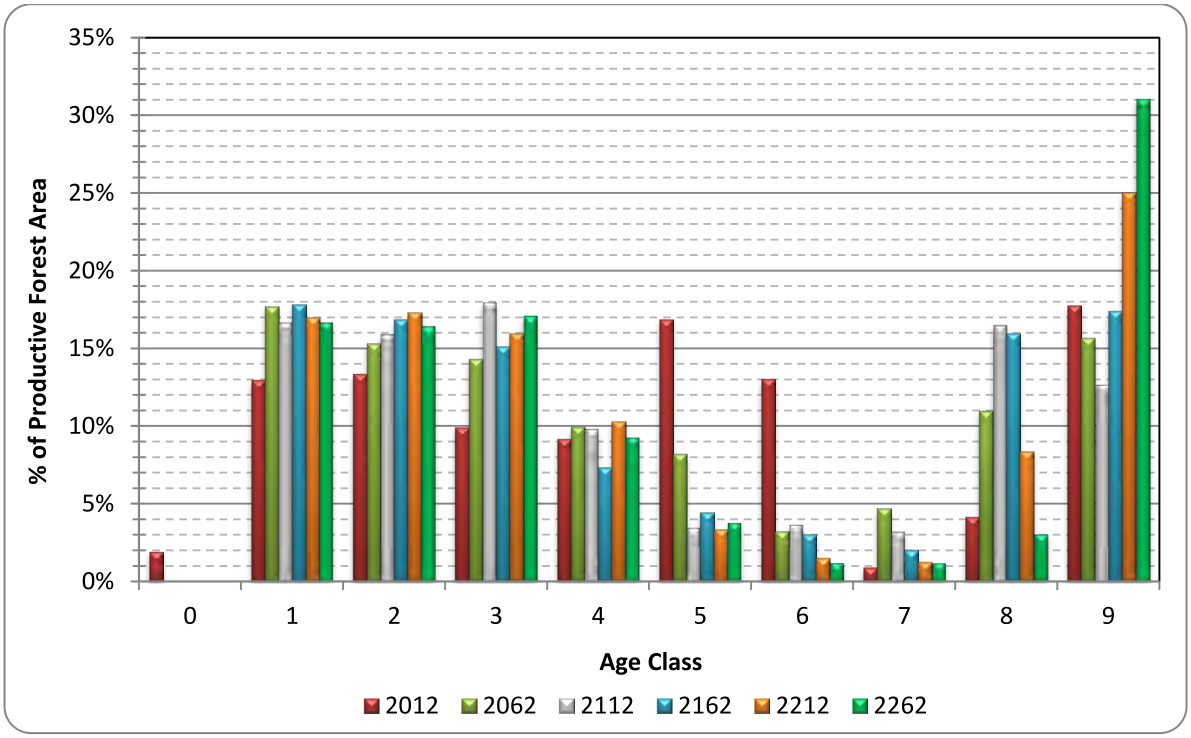

Figure 11 - Age class distribution of Block 1 productive forest area

The total THLB area in age classes 1-4 increases initially until a relatively balanced age class distribution is achieved (refer to Figure 12).

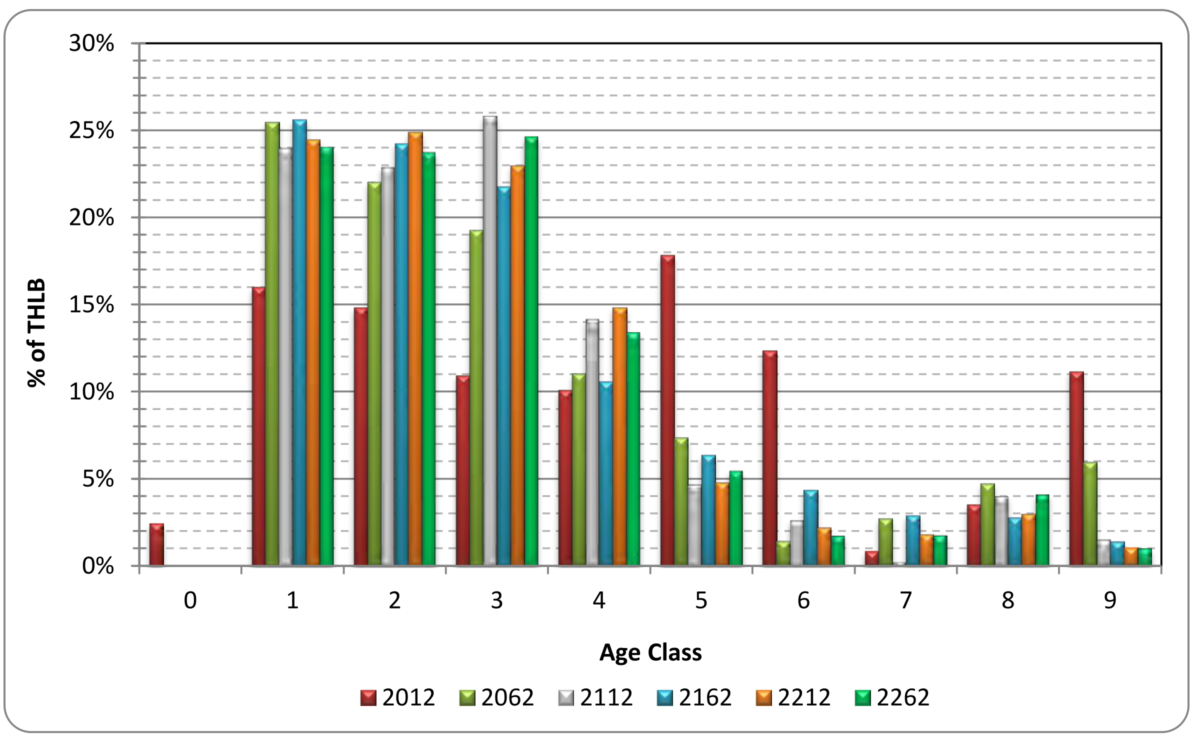

Figure 12 - Age class distribution of Block 1 THLB

Figure 13 illustrates harvestable (i.e. meets minimum harvest criteria) and total growing stock (including the ground-based / cable / non-conventional split) levels for the Block 1 timber harvesting landbase at the beginning of each decade. Total THLB growing stock declines by about 20% until the transition to harvesting future stands is mostly completed (in ninth decade) and then increases slightly due to volume accumulating within the non-conventionally operable landbase (due to the harvesting constraint applied to that portion of the THLB). Refer to Figure 10 for the contribution of each stand type to the total harvest level over time.

Once the transition to future stands is mostly completed, total THLB growing stock fluctuates between approximately 18.0 million m^3 and 18.7 million m^3. Total conventionally-operable growing stock follows a similar pattern, with the long-term growing stock varying between 12.2 million m^3 and 13.2 million m^3. The model constraint applied forced the amount of conventionally-operable growing stock at the end of the analysis period (i.e. start of Decade 26) to be greater than or equal to the amount at the start of Decade 16. More variability is found within the components of the conventionally-operable inventory, ground-based and cable. Non-conventional THLB growing stock declines by roughly 18% over the first 70 years as old, slow-growing stands are harvested and managed second growth stands are relatively young and therefore not accumulating significant volume. Over the balance of the schedule, non-conventional THLB growing stock increases as the rate of growth exceeds the rate of harvest due to the harvest constraint applied to that part of the landbase.

Harvestable volume declines significantly over the first 50 years as mature and existing second growth stands are harvested and replaced with managed stands. Once the transition to future stands is complete, harvestable volume fluctuates between 5 and 8 million m^3.

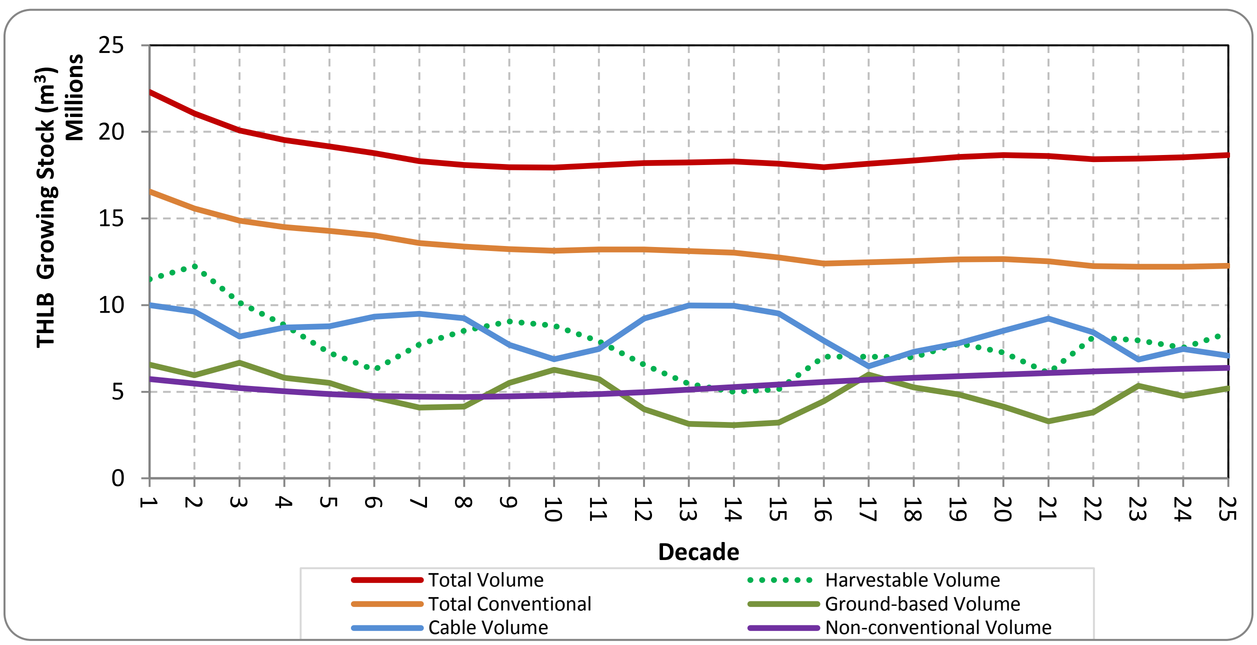

Figure 13 – Block 1 THLB Growing stock

Figure 14 provides area-weighted average statistics for timber harvested through the harvest projection. As expected, the mean age of stands harvested declines as the transition to harvesting of future managed stands occurs, dropping from 147 years old in the first decade to 98 years old in the ninth decade (2092-2101). Other than in Decade 16 (2162 – 2171), the average age of second growth (SG) harvested after the ninth decade shows moderate variation: ranging from a low of 71 years in Decade 14 (2142 – 2151) to a high of 91 years in the eighteenth decade (2182 – 2191). The average age of second growth harvested in Decade 16 (2162 – 2171) is 99 years. This relatively older average is a result of significant volume sourced from cable harvesting within natural second growth stands during that decade.

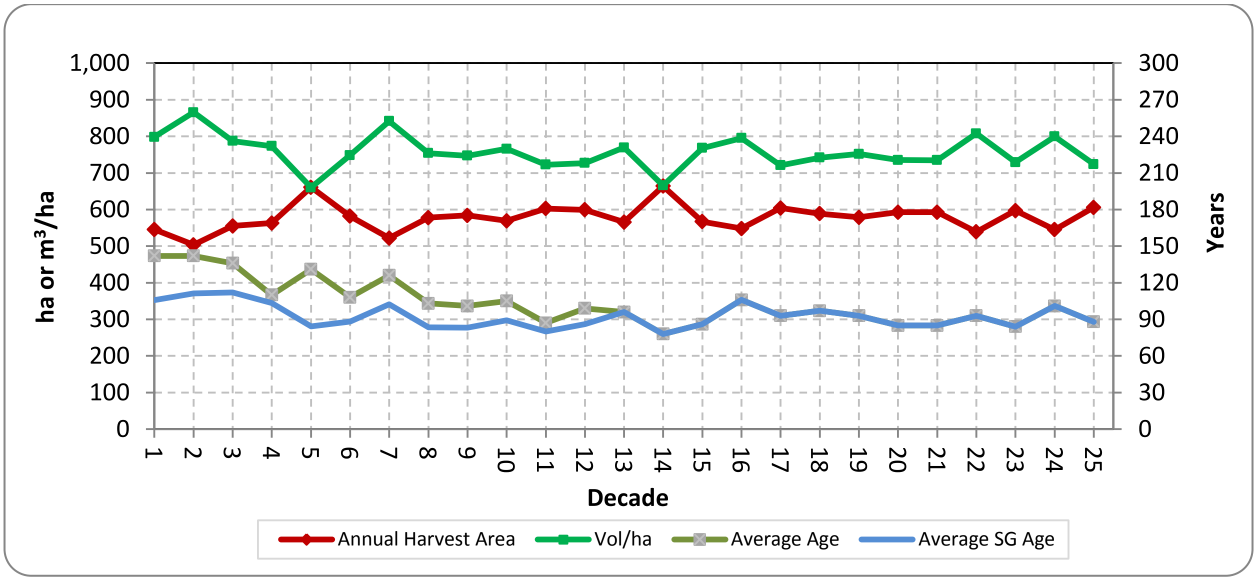

Figure 14 – Block 1 Harvest Statistics

With a constant harvest volume, annual area harvested and average volume per hectare are inversely correlated. Annual area harvested varies from 504 ha in the second decade (2022-2031) to 664 ha in the fourteenth decade. Average harvested volume per hectare ranges from 660 m^3 in the fifth decade to 865 m^3 in the second decade. .

Table 10 and Figure 15 indicate the contribution by harvesting system to total annual harvest volume and average harvest age. Non-conventional volume is constant at 50,000 m^3/year. As previously discussed in Section 2.0, once the majority of the volume is sourced from managed stands there is generally a positive relation between the amount of cable harvesting and the average harvest age. This is due to the substantially older harvest ages on cable-based areas compared to ground-based areas. Site quality of the stands harvested is also a factor in determining the average age.

More details and statistics for the Base Case harvest schedule are presented in Appendix A: Detailed Base Case Harvest Schedule Statistics.

Table 10 – Block 1 Base Case Volume Contribution by Harvesting System

				Annual Harvest Volume (m^3)			
Period (Decade #)	Start Year	End Year	Average Harvest Age (years)	Cable Harvesting	Ground-based Harvesting	Non-conventional Harvesting	Total
1	2012	2021	142	208,700	176,600	50,000	435,300
2	2022	2031	142	317,400	67,900	50,000	435,300
3	2032	2041	136	147,900	237,400	50,000	435,300
4	2042	2051	110	209,200	176,100	50,000	435,300
5	2052	2061	131	164,700	220,600	50,000	435,300
6	2062	2071	108	197,400	187,900	50,000	435,300
7	2072	2081	126	231,400	153,900	50,000	435,300
8	2082	2091	103	337,800	47,500	50,000	435,300
9	2092	2101	101	271,500	113,800	50,000	435,300
10	2102	2111	105	166,400	218,900	50,000	435,300
11	2112	2121	87	79,200	306,100	50,000	435,300
12	2122	2131	99	177,800	207,500	50,000	435,300
13	2132	2141	96	225,300	160,000	50,000	435,300
14	2142	2151	78	238,100	147,200	50,000	435,300
15	2152	2161	86	333,200	52,100	50,000	435,300
16	2162	2171	106	335,600	49,700	50,000	435,300
17	2172	2181	93	140,000	245,300	50,000	435,300
18	2182	2191	97	199,200	186,100	50,000	435,300
19	2192	2201	93	168,800	216,500	50,000	435,300
20	2202	2211	85	158,400	226,900	50,000	435,300
21	2212	2221	85	283,100	102,200	50,000	435,300
22	2222	2231	93	346,300	39,000	50,000	435,300
23	2232	2241	84	152,300	233,000	50,000	435,300
24	2242	2251	101	266,600	118,700	50,000	435,300
25	2252	2261	88	159,000	226,300	50,000	435,300

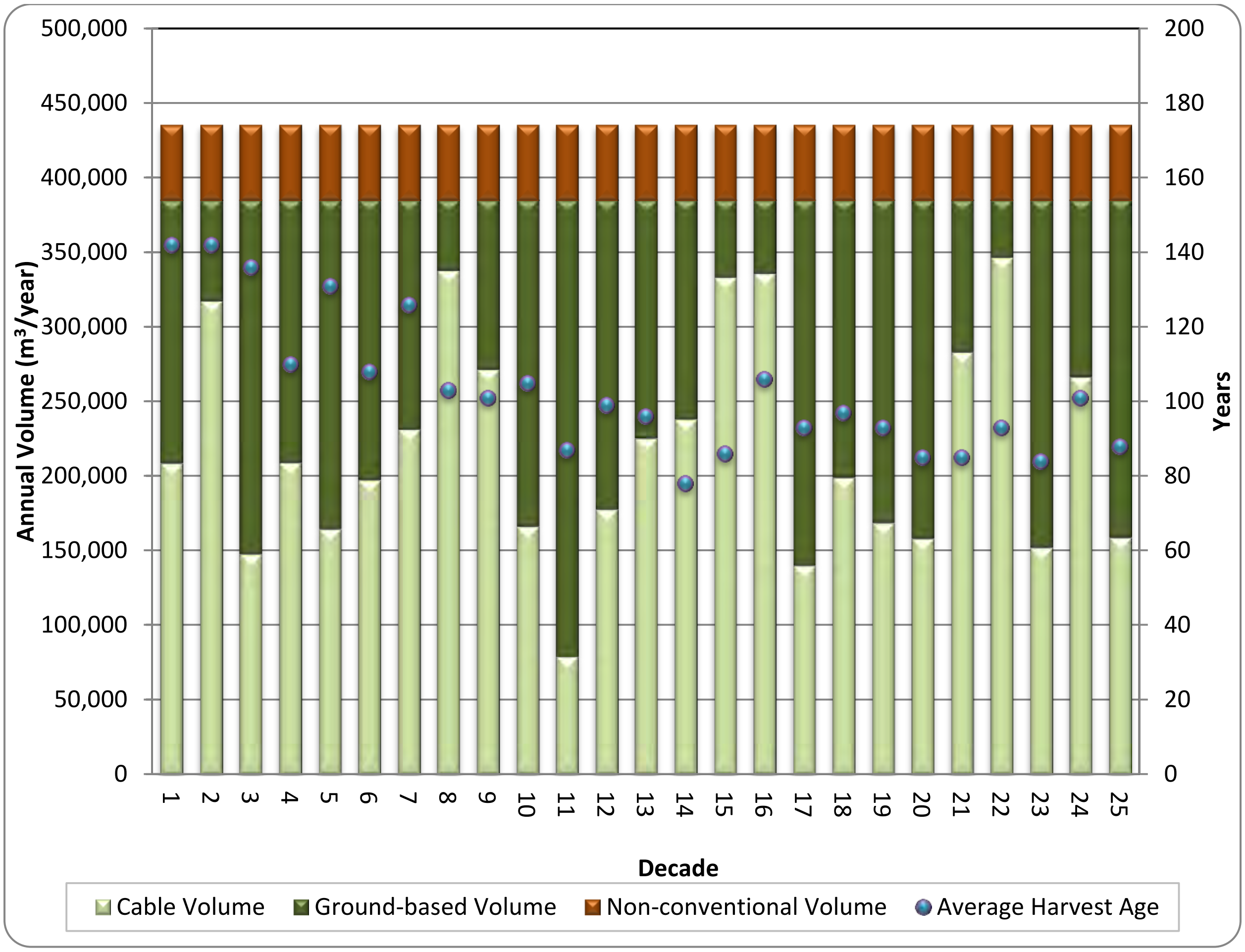

Figure 15 – Block 1 Volume Contribution by Harvesting System

2.1.2 Block 2 Base Case Details

Block 2, located northwest of the City of Campbell River on Vancouver Island, is the largest block in TFL 39: it includes 43% of the forested area of the TFL and 54% of the THLB. It contributes the largest timber supply of all blocks due to its good growing sites and high proportion of THLB operable with ground-based equipment. The current AAC attributed to this block is 1,073,271 m^3/year. Table 11 and Figure 16 present the Base Case harvest schedule for Block 2.

Table 11 – Block 2 Base Case Harvest Levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3/yr)	% Change from Previous Period
1	2012	2021	864,300	-19.5%
2	2022	2031	777,900	-10.0%
3 - 5	2032	2061	706,100	-9.2%
6	2062	2071	756,100	7.1%
7	2072	2081	806,100	6.6%
8 - 25	2082	2261	833,700	3.4%

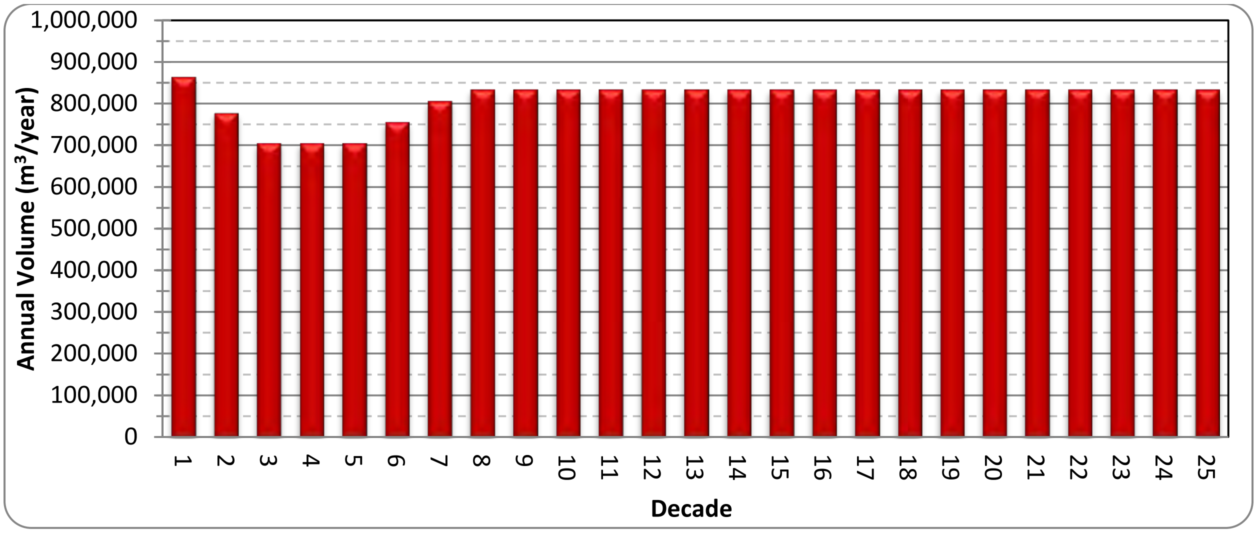

Figure 16 – Block 2 Base Case Harvest Schedule

The Base Case assumptions result in the harvest level for Block 2 declining by approximately 34% (from the current AAC contribution) over the next 30 years. Limiting future declines to 10% per decade requires an initial decline to 864,300 m^3/year. This significant decline can be attributed to several factors:

- The MP #8 analysis (done in 2000) indicated that the harvest level would have declined by 7.6%, or about 82,000 m^3/year, by now.
- New (since the MP #8 analysis) landscape-level reserves (e.g. OGMAs and WHAs) have significantly reduced available old forest, thereby reducing THLB and the volume of timber available in the short-term.
- Tenure reallocation through the *Forestry Revitalization Act*. The area removed from Block 2 contained higher than average forest inventory; therefore the AAC adjustment, done on a THLB area basis, underestimated the AAC impact.
- The constraint placed on timber supply contribution from the non-conventional landbase.
- Accounting for area removed in January 2008 to create two woodlots for which no AAC adjustment has yet been made. The area removed was estimated to provide an AAC of 4,478 m^3/year.

The harvest level declines to a low of 706,100 m^3/year in the third decade (2032 – 2041) and remains at that amount for 30 years. As harvest transitions to future stands beginning in the sixth decade (2062 – 2071), the harvest level can increase over a period of 20 years until it reaches the current estimated long-term harvest level (LTHL) of 833,700 m^3/year in 2082 (Decade 8).

Table 12 and Figure 17 indicate the contribution to the total harvest volume by period from each of the stand establishment histories. Old stands contribute the greatest volume in the first 20 years and declines significantly to become a minor component of the harvest volume in the following 80 years. Natural second growth provides approximately one-quarter of the volume in the first 40 years and then declines to less than 1% by Decade 8 (2082 – 2091). Current managed second growth contributes the majority of volume beginning in Decade 3 (2032 – 2041) and does so for 50 years. Beginning in the eight decade, future stands contribute the most volume as the contribution from current managed second growth declines. During Decade 16 and 17 (i.e. 2162 - 2181) both natural and current managed second growth contribute to timber supply. The natural second growth contribution results from a large share of these stands having reached old seral age (i.e. at least 251 years old) and thus can contribute to the OGMA targets for the end of the second rotation (see Section 11.2.4 in the Information Package for details). In order to meet the second rotation OGMA targets, some of the older natural second growth stands within the THLB must not be harvested until sufficient old forest exists within the non-contributing landbase. This occurs in Decade 16 and 17, thus creating harvest opportunity within the natural second growth stands. The contribution of current managed second growth stands is from stands that are less than 10 years old in 2012 growing on poor sites and operable by cable systems. The minimum harvest criteria applied dictates that such stands are not available for harvest until this time period.

Table 12 - Stand Types' contribution to Block 2 Base Case harvest

			Annual Harvest Volume (m^3)					
Period (Decade #)	Start Year	End Year	Current Old	Current Mature	Natural Second Growth	Current Managed Second	Future Stands	Total
1	2012	2021	566,300	46,800	249,900	1,300	0	864,300
2	2022	2031	444,900	9,100	215,600	108,300	0	777,900
3	2032	2041	152,000	6,800	173,300	374,000	0	706,100
4	2042	2051	78,900	300	172,000	454,900	0	706,100
5	2052	2061	79,200	0	99,700	520,200	7,000	706,100
6	2062	2071	64,700	2,500	47,000	621,300	20,600	756,100
7	2072	2081	67,200	0	48,300	450,300	240,300	806,100
8	2082	2091	54,700	0	7,200	261,700	510,100	833,700
9	2092	2101	40,000	0	300	109,500	683,900	833,700
10	2102	2111	20,700	0	12,900	182,900	617,200	833,700
11	2112	2121	2,100	0	3,400	118,900	709,300	833,700
12	2122	2131	2,100	0	4,800	106,300	720,500	833,700
13	2132	2141	2,100	0	400	37,400	793,800	833,700
14	2142	2151	2,100	0	2,600	10,900	818,100	833,700
15	2152	2161	2,100	0	8,700	6,100	816,800	833,700
16	2162	2171	2,100	0	35,500	173,800	622,300	833,700
17	2172	2181	2,100	0	38,000	14,800	778,800	833,700
18	2182	2191	2,100	0	900	3,600	827,100	833,700
19	2192	2201	2,100	0	1,000	11,000	819,600	833,700
20	2202	2211	2,100	0	0	3,500	828,100	833,700
21	2212	2221	800	0	0	600	832,300	833,700
22	2222	2231	100	0	0	1,600	832,000	833,700
23	2232	2241	100	0	0	1,200	832,400	833,700
24	2242	2251	100	0	0	600	833,000	833,700
25	2252	2261	100	0	0	500	833,100	833,700

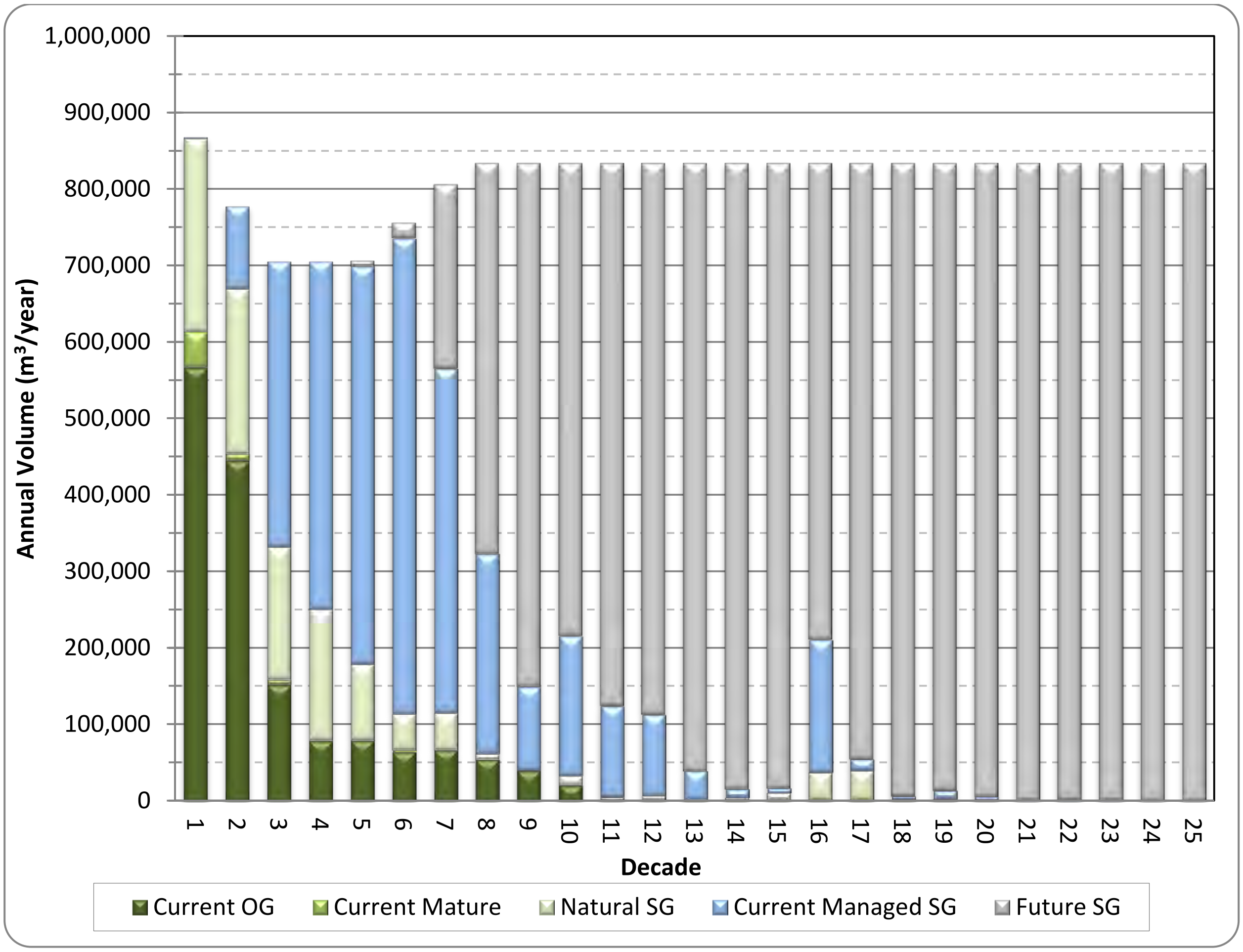

Figure 17 – Stand Types' contribution to Block 2 Base Case harvest

Age class (refer to Table 6) distributions over time based on the 5-year age groupings used in Woodstock are examined in Figure 18 and Figure 19. Age class "zero" only exists in the first time period (2012) due to the presence of NSR lands (and stands established in 2010 and 2011) whereas in future time periods the model "regenerates" harvested stands immediately (a 1-year regeneration delay is incorporated in the yield tables). Within the productive forest the total area in the oldest age class declines by 45% over the first 100 years as old growth is harvested. Subsequently the total area of old forest increases as younger reserved timber ages into the old growth age class (see Figure 18).

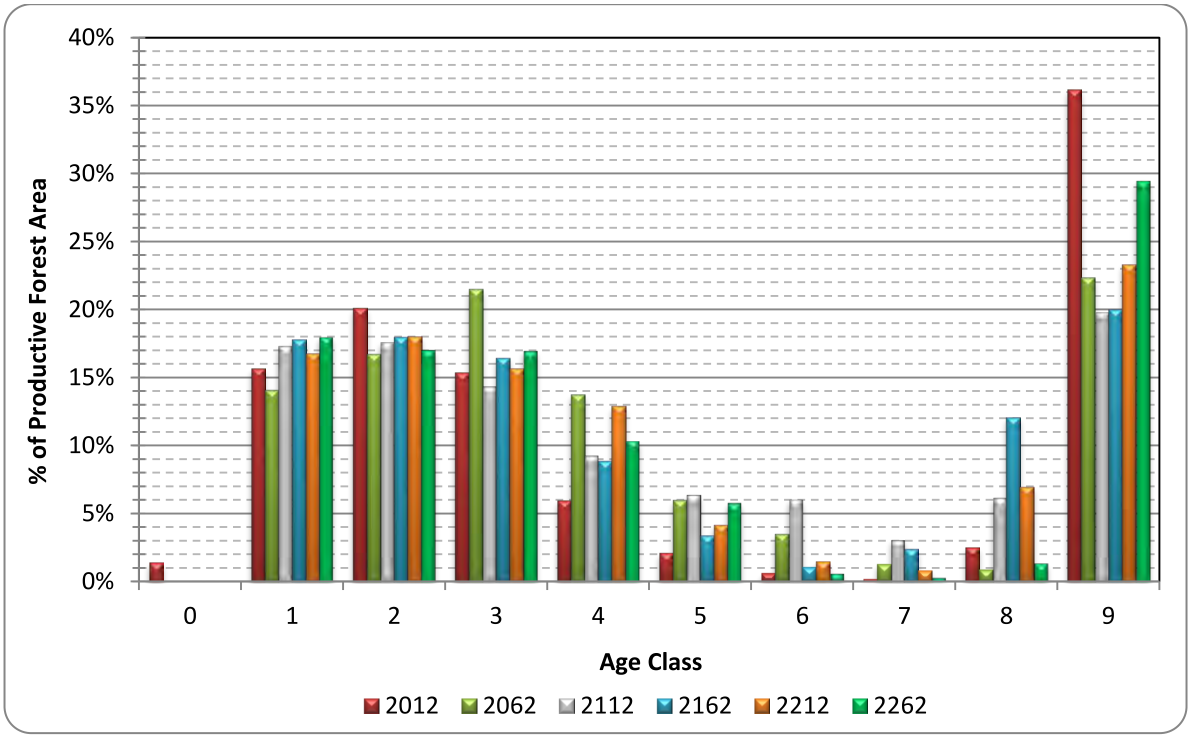

Figure 18 - Age class distribution of Block 2 productive forest area

The total THLB area in age classes 1-4 increases initially until a relatively balanced age class distribution is achieved (refer to Figure 19).

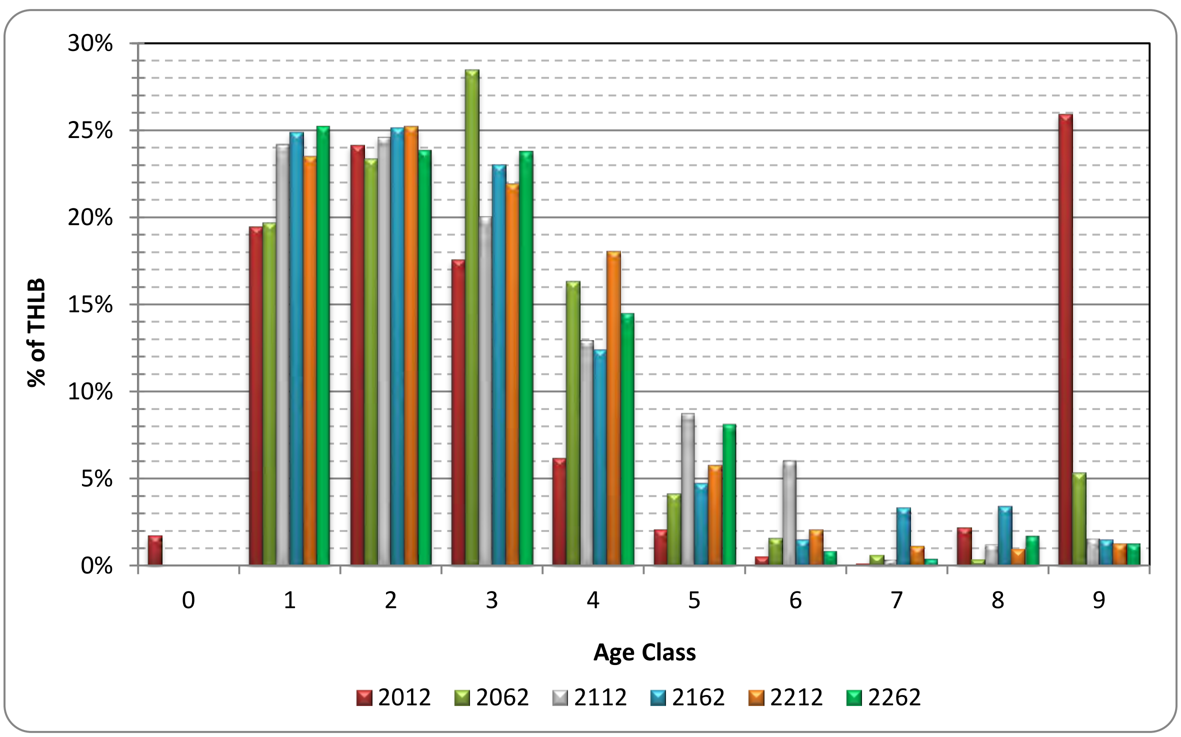

Figure 19 - Age class distribution of Block 2 THLB

Figure 20 illustrates harvestable (i.e. meets minimum harvest criteria) and total growing stock (including the ground-based / cable / non-conventional split) levels for the Block 2 timber harvesting landbase at the beginning of each decade. Total THLB growing stock declines by about 11% over the first 20 years until the transition to second growth harvesting is mostly completed and then returns to near current levels as future stands begin to acquire merchantable volume but harvesting is occurring mainly in existing stands. Refer to Figure 17 for the contribution of each stand type to the total harvest level over time.

Once the transition to future stands is mostly completed, total THLB growing stock fluctuates between approximately 30.7 million m^3 and 32.0 million m^3. Total conventionally-operable growing stock follows a similar pattern, with the long-term growing stock varying between 26.5 million m^3 and 29.0 million m^3. The model constraint applied forced the amount of conventionally-operable growing stock at the end of the analysis period (i.e. start of Decade 26) to be greater than or equal to the amount at the start of Decade 16. Greater variability is found within the ground-based and cable components of the conventionally-operable inventory. Non-conventional THLB growing stock declines by roughly 26% over the first 60 years as old stands are harvested and managed second growth stands are relatively young and therefore not accumulating significant volume. Over the remaining 190 years of the schedule, non-conventional THLB growing stock increases as growth exceeds harvest due to the harvest constraint applied to that part of the landbase.

Harvestable volume declines significantly over the first 50 years as old growth and existing second growth stands are harvested and replaced with managed stands. Once the transition to future stands is complete, harvestable volume fluctuates between 8 and 14 million m^3.

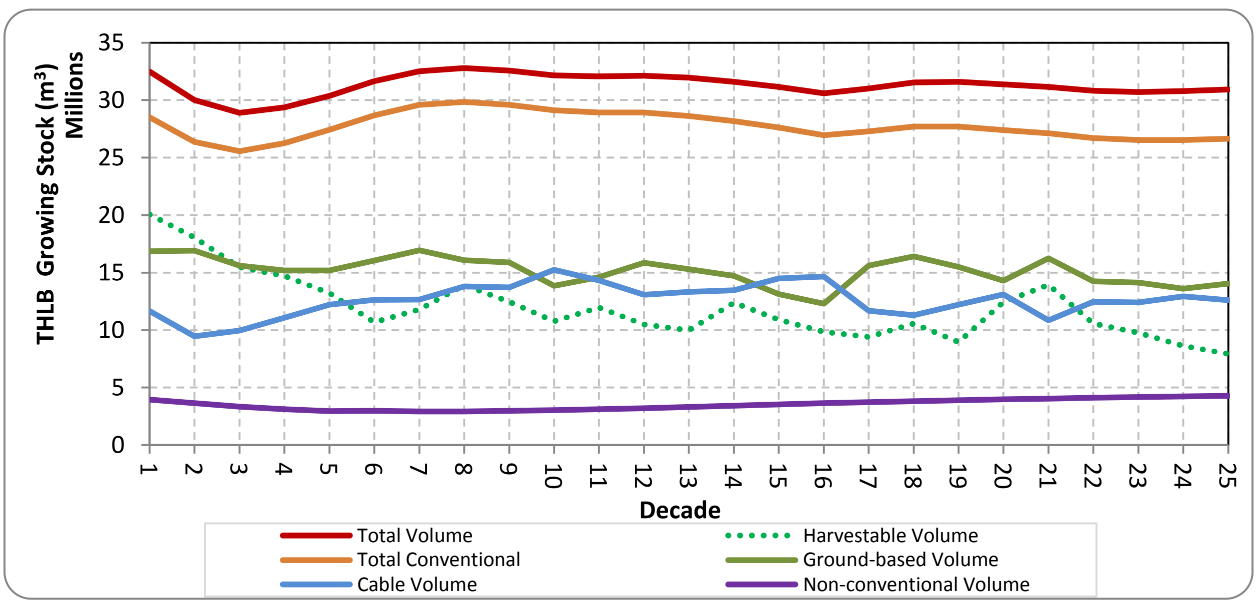

Figure 20 – Block 2 THLB Growing stock

Figure 21 provides area-weighted average statistics for timber harvested through the harvest projection. As expected, the mean age of stands harvested declines as the contribution of managed stands increases, dropping from 242 years old in the first decade to 88 years old in the ninth decade (2092-2101). Other than in Decade 16 (2162 – 2171), the average age of second growth (SG) harvested shows moderate variation: ranging from a low of 75 years in Decade 3 (2032 – 2041) to a high of 98 years in the Decade 24 (2242 – 2251) and averaging 84 years. The average age of second growth harvested in Decade 16 (2162 – 2171) is 120 years. This relatively older average is a result of significant volume sourced from cable harvesting within current managed second growth stands during that decade.

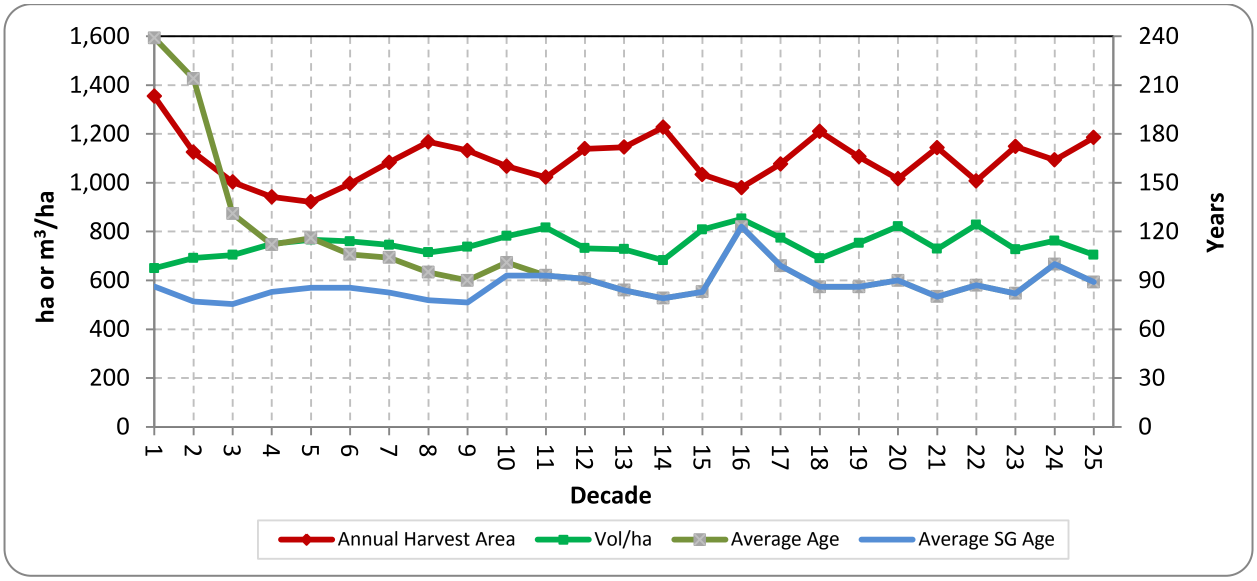

Figure 21 – Block 2 Harvest Statistics

Annual area harvested declines from 1,354 ha to 921 ha over the first 50 years as the harvest level declines. Meanwhile over the same timeframe, average volume harvested increases from 649 m^3/ha to 767 m^3/ha as harvesting transitions to managed stands. As the harvest level increases between the fifth and eight decade, annual area harvested increases from 921 ha to 1,167 ha. After that, the annual harvest area generally fluctuates between 1,000 ha and 1,200 ha while average harvested volume per hectare ranges from 680 m^3 to 850 m^3.

Table 13 and Figure 22 indicate the contribution by harvesting system to total annual harvest volume and average harvest age. Except for Decade 5 when it decreases to 28,900 m^3/year, the non-conventional contribution is consistently 40,000 m^3/year. Once again there is generally a direct relation between the amount of cable harvesting and the average harvest age once the majority of the volume is sourced from managed stands. This is due to the substantially older harvest ages on cable-based areas compared to ground-based areas. Site quality of the stands harvested is also a factor in determining the average age. The significant cable volume in Decade 16 and the corresponding average harvest age discussed earlier (associated with natural and current managed second growth contribution) is evident.

More details and statistics for the Base Case harvest schedule are presented in Appendix A: Detailed Base Case Harvest Schedule Statistics.

Table 13 – Block 2 Base Case Volume Contribution by Harvesting System

				Annual Harvest Volume (m³)			
Period (Decade #)	Start Year	End Year	Average Harvest Age	Cable Harvesting	Ground-based Harvesting	Non-conventional Harvesting	Total
1	2012	2021	239	428,200	396,100	40,000	864,300
2	2022	2031	214	187,700	550,200	40,000	777,900
3	2032	2041	131	185,800	480,300	40,000	706,100
4	2042	2051	112	206,000	460,100	40,000	706,100
5	2052	2061	116	265,200	412,000	28,900	706,100
6	2062	2071	106	299,600	416,500	40,000	756,100
7	2072	2081	104	194,800	571,300	40,000	806,100
8	2082	2091	95	311,100	482,600	40,000	833,700
9	2092	2101	90	155,800	637,900	40,000	833,700
10	2102	2111	101	393,400	400,300	40,000	833,700
11	2112	2121	93	399,600	394,100	40,000	833,700
12	2122	2131	91	252,300	541,400	40,000	833,700
13	2132	2141	84	280,600	513,100	40,000	833,700
14	2142	2151	79	201,700	592,000	40,000	833,700
15	2152	2161	83	286,200	507,500	40,000	833,700
16	2162	2171	123	582,000	211,700	40,000	833,700
17	2172	2181	99	323,200	470,500	40,000	833,700
18	2182	2191	86	204,300	589,400	40,000	833,700
19	2192	2201	86	218,300	575,400	40,000	833,700
20	2202	2211	90	514,300	279,400	40,000	833,700
21	2212	2221	80	137,200	656,500	40,000	833,700
22	2222	2231	87	322,400	471,300	40,000	833,700
23	2232	2241	82	258,700	535,000	40,000	833,700
24	2242	2251	100	334,300	459,400	40,000	833,700
25	2252	2261	89	322,200	471,500	40,000	833,700

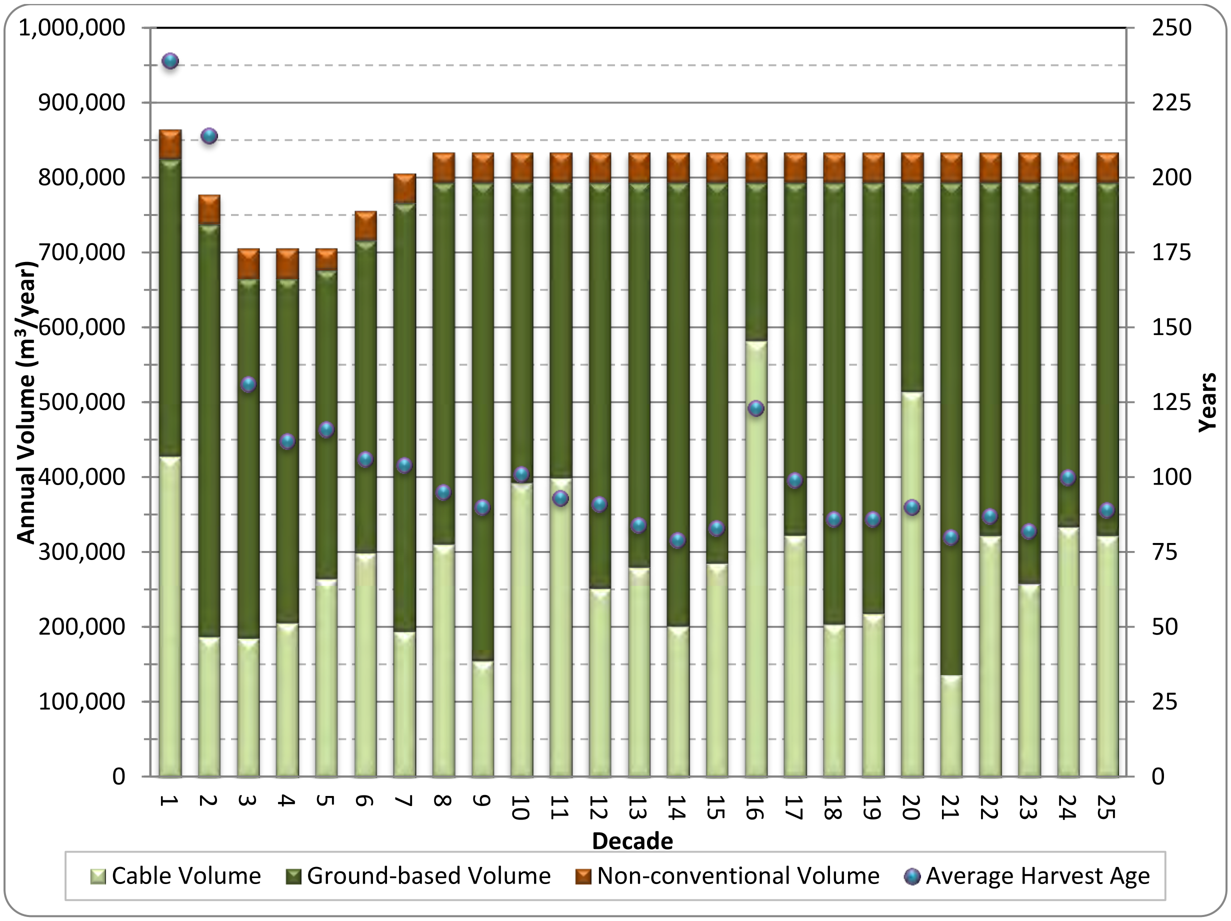

Figure 22 – Block 2 Volume Contribution by Harvesting System

2.1.3 Block 4 Base Case Details

Block 4 is located southwest of the Town of Port McNeill on Vancouver Island. It includes about 12% of the forested area of TFL 39 and 15% of the THLB. The land base within Block 4 is the least constrained of the five supply blocks within TFL 39; the THLB is slightly more than 75% of the productive forest area. In MP #8, Block 3 and 4 were modeled as a single unit and the current AAC contribution attributed to these blocks is 288,690 m^3/year. Allocating this AAC based on THLB results in an AAC for Block 4 of roughly 258,690 m^3/year. Table 14 and Figure 23 present the Base Case harvest schedule for Block 4.

Table 14 – Block 4 Base Case Harvest Levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3/yr)	% Change from Previous Period
1 - 4	2012	2051	197,000	-23.8%
5	2052	2061	216,700	10.0%
6 - 10	2062	2111	237,300	9.5%
11 - 25	2112	2261	249,900	5.3%

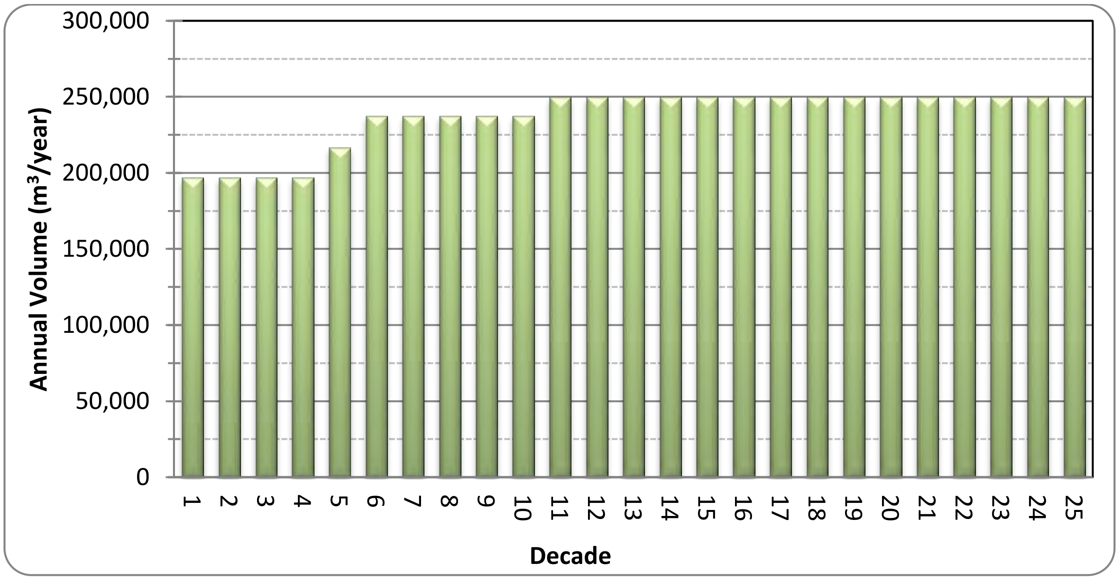

Figure 23 – Block 4 Base Case Harvest Schedule

The Base Case assumptions indicate an initial harvest level for Block 4 of 197,000 m^3/year; a decline of nearly 24%. This significant decline can be attributed to several factors:

- New (since the MP #8 analysis) landscape-level reserves (e.g. OGMAs and WHAs) have significantly reduced available old forest, thereby reducing THLB and the volume of timber available in the short-term.
- The constraint placed on timber supply contribution from the non-conventional.
- Accounting for area removed in January 2010 to create a community forest for which no AAC adjustment has yet been made. The area removed was estimated to provide an AAC of 10,000 m^3/year.
- As mentioned earlier, in MP #8 Blocks 3 and 4 were analyzed as a single unit. The age class distributions of these two blocks lent themselves to this, with Block 3 having significant THLB area and volume in old and natural second growth age classes while the Block 4 THLB was split between old and young stands. Since Block 3 has been greatly reduced in size due to the *Forestry Revitalization* Act and is now subject to the requirements of the *South Central Coast Order*, it is combined with Block 5 (also subject to the *SCCO*) in this analysis. With additional old forest reserved, the Block 4 THLB is heavily skewed to young forest (see Figure 26 below).

The harvest level remains at 197,000 m^3/year for 40 years before increasing to 237,300 m^3/year over a period of 20 years as timber supply transitions from natural stands to managed stands. It remains at that level for 50 years and then increases (in the eleventh decade (2112 – 2121)) to the current estimated long-term harvest level (LTHL) of 249,900 m^3/year.

Table 15 and Figure 24 indicate the contribution to the total harvest volume by period from each of the stand establishment histories. Old stands contribute the greatest volume in the first 20 years, declines significantly to become a minor component of the harvest volume in the following 40 years and, except for the last 10 years when 4% of the harvest is old timber harvested via non-conventional, immaterial volume thereafter. Natural second growth provides approximately one-third of the volume in the first 20 years and then about 15% during the next 50 years. For the rest of the schedule, these stands never provide more than 1% of total timber supply in any decade. Current managed second growth contributes the majority of volume beginning in Decade 3 (2032 – 2041) and does so for 60 years. Beginning in the ninth decade (2092 – 2101), future stands contribute the most volume as the contribution from current managed second growth declines. During Decade 16 (2162 - 2171), as in Block 2, current managed second growth contributes substantial volume. This contribution is from stands that are less than 10 years old in 2012 growing on poor sites and operable by cable systems. The minimum harvest criteria applied dictates that such stands are not available for harvest until this time period.

Table 15 - Stand Types' contribution to Block 4 Base Case harvest

			Annual Harvest Volume (m^3)					
Period (Decade #)	Start Year	End Year	Current Old	Current Mature	Natural Second Growth	Current Managed	Future Stands	Total
1	2012	2021	120,800	14,100	61,200	900	0	197,000
2	2022	2031	97,600	2,000	69,000	28,400	0	197,000
3	2032	2041	45,900	200	41,300	109,600	0	197,000
4	2042	2051	37,100	0	48,700	109,100	2,100	197,000
5	2052	2061	47,400	0	33,300	135,900	100	216,700
6	2062	2071	9,500	0	2,800	224,300	700	237,300
7	2072	2081	3,400	0	28,400	204,400	1,100	237,300
8	2082	2091	2,400	0	3,800	187,000	44,100	237,300
9	2092	2101	0	0	0	95,000	142,300	237,300
10	2102	2111	0	0	2,100	40,800	194,400	237,300
11	2112	2121	0	0	0	29,300	220,600	249,900
12	2122	2131	0	0	0	21,900	228,000	249,900
13	2132	2141	0	0	0	400	249,500	249,900
14	2142	2151	0	0	0	6,600	243,300	249,900
15	2152	2161	0	0	800	1,500	247,600	249,900
16	2162	2171	900	0	2,000	54,000	193,000	249,900
17	2172	2181	100	0	0	1,700	248,100	249,900
18	2182	2191	0	0	0	3,600	246,300	249,900
19	2192	2201	0	0	0	2,400	247,500	249,900
20	2202	2211	0	0	0	5,600	244,300	249,900
21	2212	2221	0	0	0	0	249,900	249,900
22	2222	2231	0	0	0	3,200	246,700	249,900
23	2232	2241	0	0	0	4,200	245,700	249,900
24	2242	2251	0	0	0	300	249,600	249,900
25	2252	2261	9,800	0	2,200	4,800	233,100	249,900

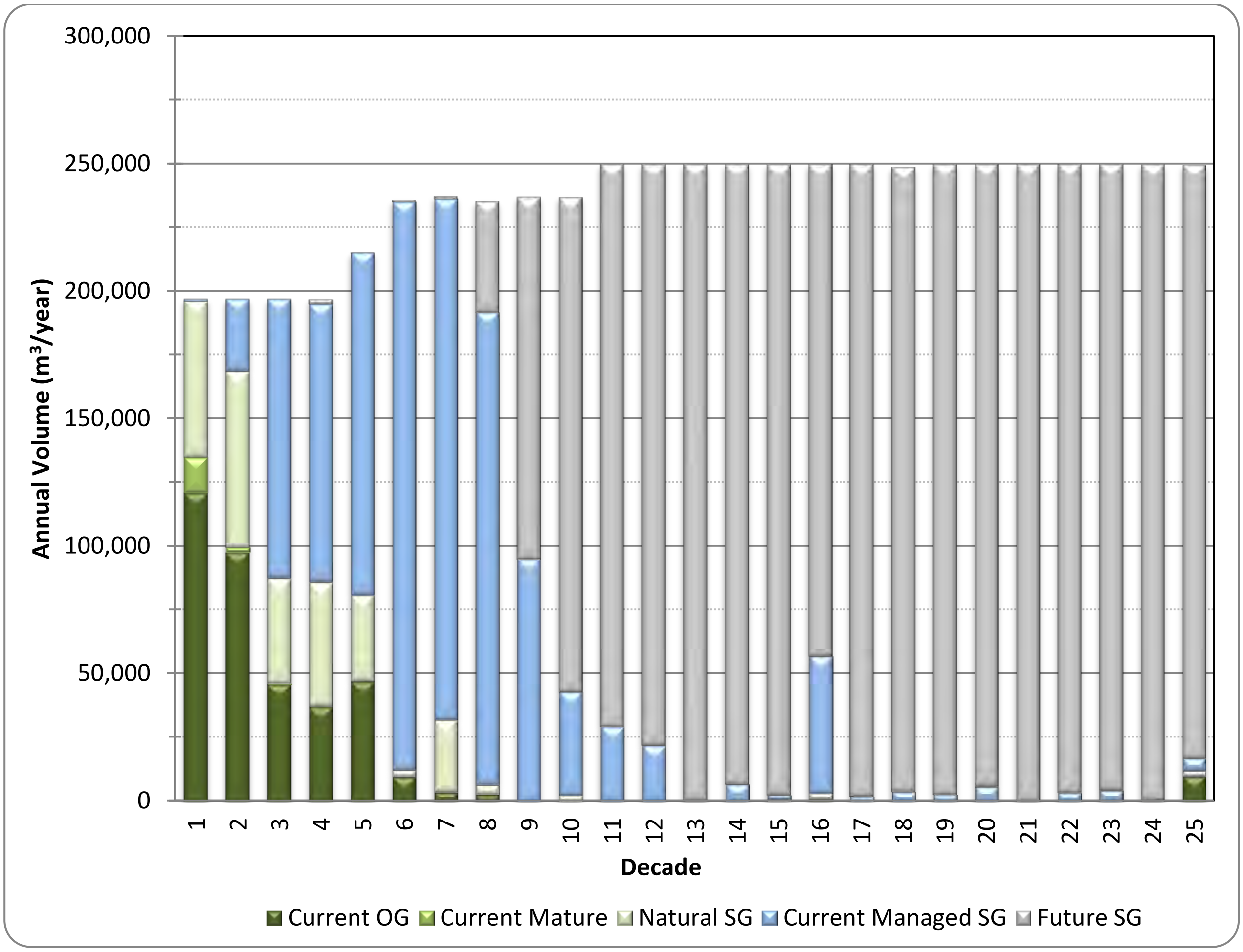

Figure 24 – Stand Types' contribution to Block 4 Base Case harvest

Age class (refer to Table 6) distributions over time based on the 5-year age groupings used in Woodstock are examined in Figure 25 and Figure 26. Age class "zero" only exists in the first time period (2012) due to the presence of NSR lands (and stands established in 2010 and 2011) whereas in future time periods the model "regenerates" harvested stands immediately (a 1-year regeneration delay is incorporated in the yield tables). Within the productive forest the total area in the oldest age class declines by more than 50% over the first 100 years as old growth is harvested. Subsequently the total area of old forest increases as younger reserved timber ages into the old growth age class (see Figure 25).

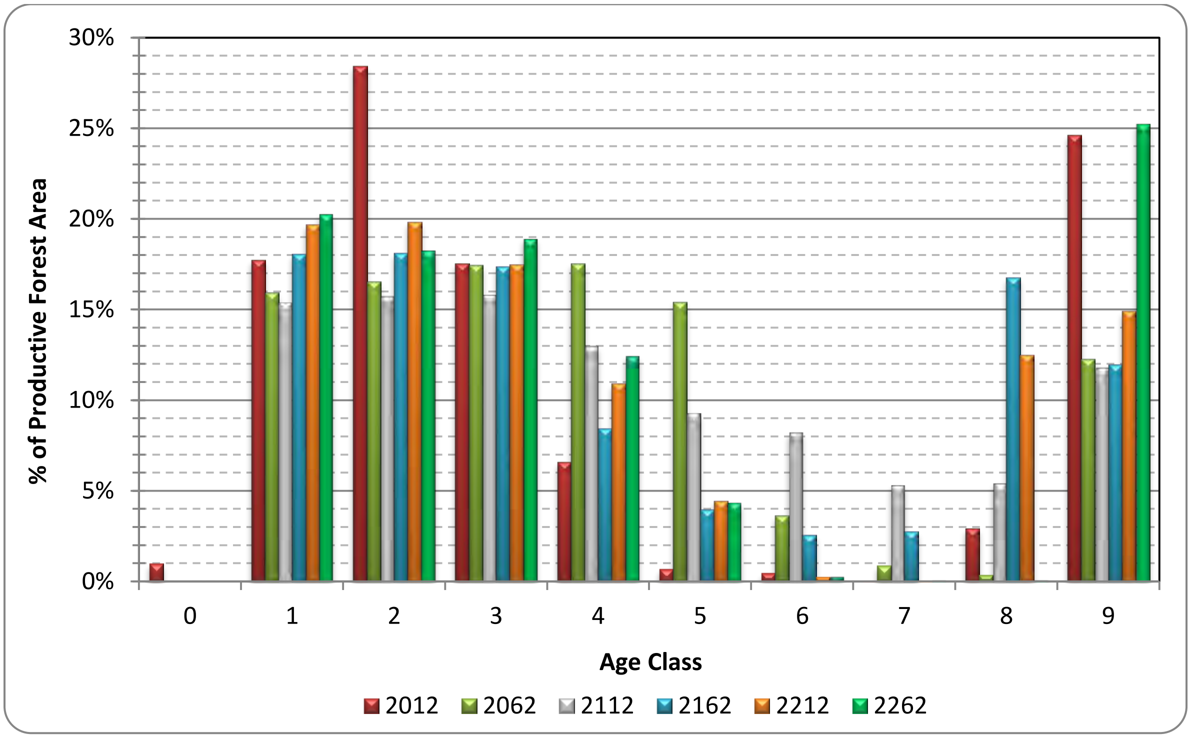

Figure 25 - Age class distribution of Block 4 productive forest area

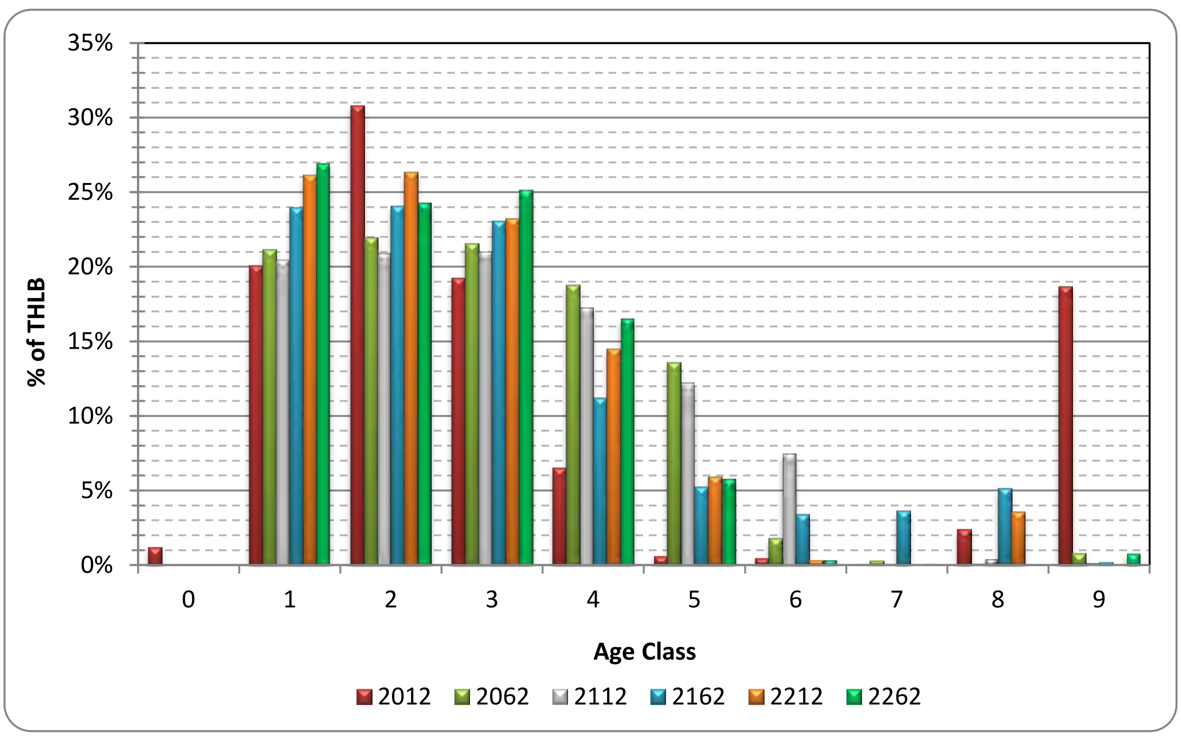

Figure 26 - Age class distribution of Block 4 THLB

The uneven THLB age class distribution is evident in Figure 26 (refer to 2012 values) with over

50% of the THLB area comprised of stands younger than 41 years old (i.e. less than age class 3) and negligible area between 81 and 140 years old (i.e. in age class 5, 6 or 7). As a result, short-term timber supply is highly dependent on old forest and second growth minimum harvest criteria. The dependence on old forest is indicated by the reduction in age class 8 and 9 within the THLB between 2012 and 2062. The lack of older second growth restricts mid-term timber supply.

Figure 27 illustrates harvestable (i.e. meets minimum harvest criteria) and total growing stock (including the ground-based / cable / non-conventional split) levels for the Block 4 timber harvesting land base at the beginning of each decade. Total THLB growing stock increases by about 25% over the first eleven decades as volume is initially accumulating within the conventionally operable THLB and later in the non-conventional operable THLB. Over the remaining 140 years, the THLB growing stock slowly declines by nearly 2 million m^3.

Total conventionally-operable growing stock follows a similar pattern, peaking at 9.9 million m^3 to start the sixth decade (2062 – 2071). It then declines to 7.9 million m^3 to start the sixteenth decade (2162 – 2171) with little variation after that. The model constraint applied forced the amount of conventionally-operable growing stock at the end of the analysis period (i.e. start of Decade 26) to be greater than or equal to the amount at the start of Decade 16. Greater variability is found within the ground-based and cable components of the conventionally-operable inventory. Cable-operable THLB growing stock increases by more than 2 million m^3 over the first 50 years as growth occurs within young stands yet to reach the minimum harvest criteria. Ground-based volume increases by 48%, peaking at 5.7 million m^3 to start the ninth decade (2092 – 2101), before returning to the present amount to start the twelfth decade (2102 – 2121) and fluctuating between 3.0 and 4.5 million m^3 thereafter.

Non-conventional THLB growing stock declines by roughly 60% over the first 60 years as old stands are harvested and managed second growth stands are relatively young and therefore not accumulating significant volume. During the next 100 years of the schedule, non-conventional THLB growing stock increases as growth exceeds harvest due to few stands meeting the minimum harvest criteria (note the low level of non-conventional harvest during this period in Figure 29). Over the final 90 years of the schedule, non-conventional THLB growing stock declines by 50% as harvesting resumes. Recall that no constraint is applied to the non-conventional THLB growing stock.

Harvestable volume closely follows the ground-based THLB growing stock pattern. Once the transition to future stands is complete, harvestable volume fluctuates between 2.8 and 4.3 million m^3.

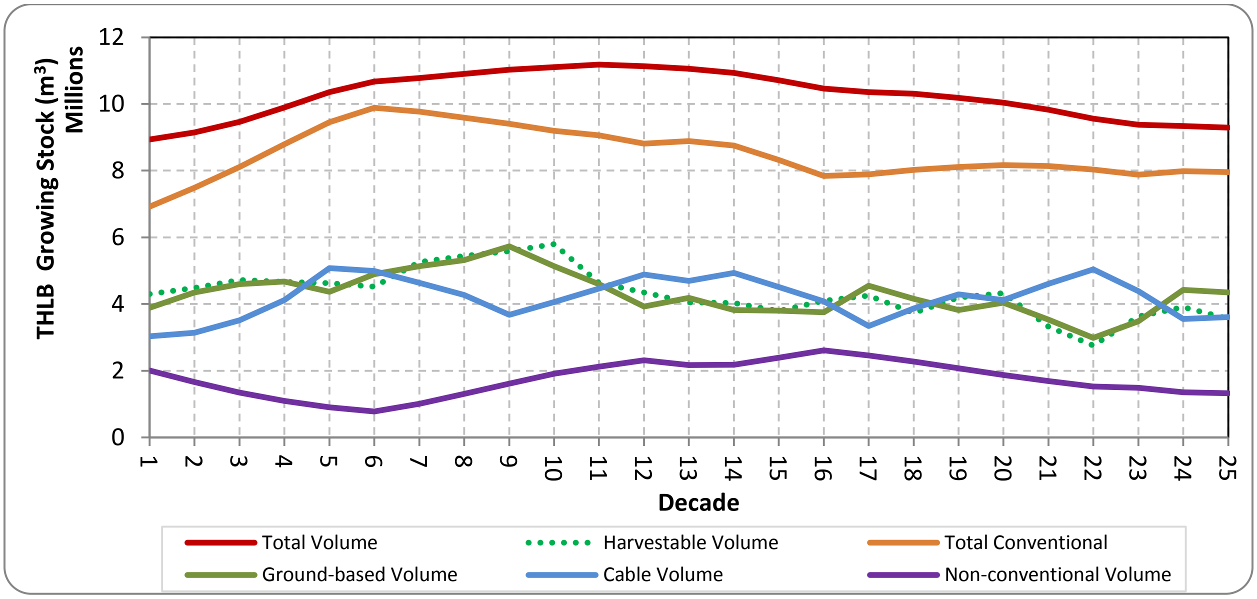

Figure 27 – Block 4 THLB Growing stock

Figure 28 provides area-weighted average statistics for timber harvested through the harvest projection. As expected, the mean age of stands harvested declines as the contribution of managed stands increases, dropping from 242 years old in the first decade to 89 years old in the ninth decade (2092-2101). Other than in Decade 16 (2162 – 2171), once managed stands provide the bulk of the harvest, the average age of second growth (SG) harvested shows moderate variation: ranging from a low of 76 years in Decade 15 (2152 – 2161) to a high of 100 years in the Decade 12 (2122 – 2131) and averaging 90 years. The average age of second growth harvested in Decade 16 (2162 – 2171) is 108 years. This relatively older average is a result of significant volume sourced from cable harvesting within current managed second growth stands during that decade.

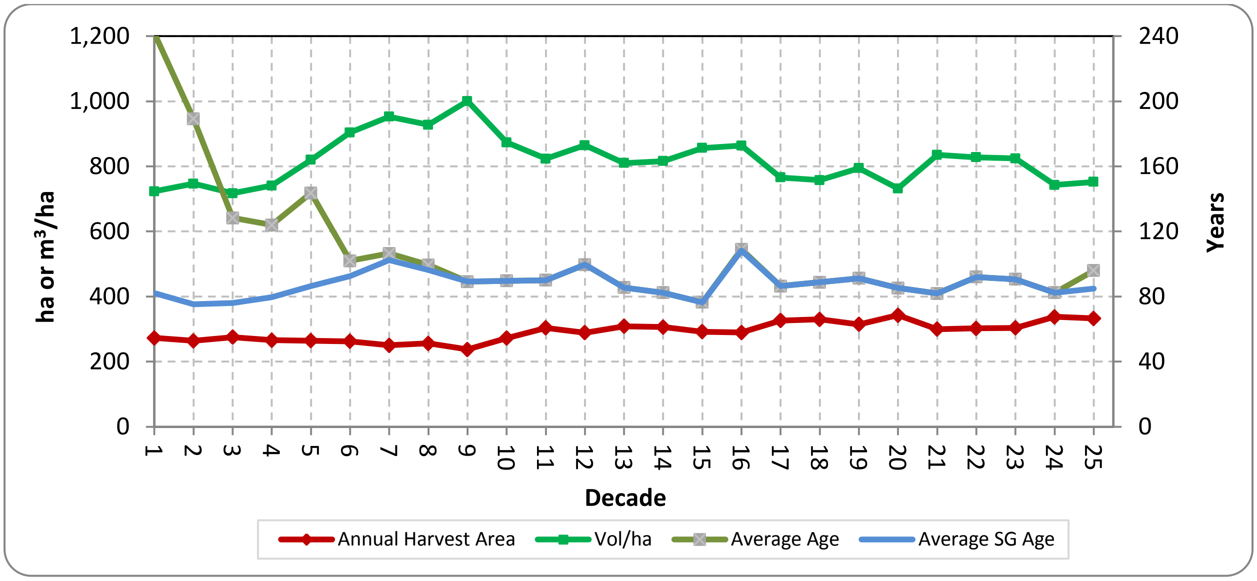

Figure 28 – Block 4 Harvest Statistics

Annual area harvested declines slightly from 273 ha to 237 ha over the first 90 years as the harvest shifts to future managed stands. Meanwhile over the same timeframe, average volume harvested increases from 723 m^3/ha to 1000 m^3/ha. The average volume per hectare reaches such high figures due to the large proportion of young forest currently in the THLB. As these stands reach merchantable ages over a relatively short time frame, a significant portion of them are harvested at ages much older than the minimum ages and thus are forecast to contain significant merchantable volume (based on the managed-stand yield tables detailed in the Information Package). With the harvest level increase in the eleventh decade (2112 – 2121), annual area harvested increases and generally fluctuates between 300 ha and 330 ha while average harvested volume per hectare gradually declines as the forest becomes more "normalized" (i.e. more evenly balanced THLB age class distribution).

Table 16 and Figure 29 indicate the contribution by harvesting system to total annual harvest volume and average harvest age. Non-conventional volume is steady at 36,000 m3/year for the first 40 years and then declines to nearly zero as non-conventional operable inventory is heavily depleted. As inventory levels recover as managed stands age, non-conventional volume contribution to timber supply returns to previous levels.

As was seen in Blocks 1 and 2, there is generally a direct relation between the amount of cable harvesting and the average harvest age once the majority of the volume is sourced from managed stands. The significant cable volume in Decade 16 and the corresponding average harvest age discussed earlier (associated with current managed second growth contribution) is noticeable.

More details and statistics for the Base Case harvest schedule are presented in Appendix A: Detailed Base Case Harvest Schedule Statistics.

Table 16 – Block 4 Base Case Volume Contribution by Harvesting System

				Annual Harvest Volume (m^3)			
Period (Decade #)	Start Year	End Year	Average Harvest Age	Cable Harvesting	Ground-based Harvesting	Non-conventional Harvesting	Total
1	2012	2021	231	81,000	80,000	36,000	197,000
2	2022	2031	194	63,400	97,600	36,000	197,000
3	2032	2041	135	49,500	111,500	36,000	197,000
4	2042	2051	129	17,600	143,400	36,000	197,000
5	2052	2061	145	115,300	68,200	33,200	216,700
6	2062	2071	102	128,000	105,400	3,900	237,300
7	2072	2081	108	124,800	112,200	300	237,300
8	2082	2091	100	147,100	89,600	600	237,300
9	2092	2101	89	55,700	181,200	400	237,300
10	2102	2111	91	65,200	164,300	7,800	237,300
11	2112	2121	92	67,400	176,300	6,200	249,900
12	2122	2131	101	121,200	92,700	36,000	249,900
13	2132	2141	88	75,200	156,700	18,000	249,900
14	2142	2151	84	131,800	118,100	0	249,900
15	2152	2161	77	126,400	123,500	0	249,900
16	2162	2171	112	161,000	52,900	36,000	249,900
17	2172	2181	90	45,700	168,200	36,000	249,900
18	2182	2191	93	66,500	147,400	36,000	249,900
19	2192	2201	96	124,400	89,500	36,000	249,900
20	2202	2211	91	54,000	159,900	36,000	249,900
21	2212	2221	86	57,800	156,100	36,000	249,900
22	2222	2231	96	158,500	66,800	24,600	249,900
23	2232	2241	94	165,700	48,200	36,000	249,900
24	2242	2251	85	82,500	142,800	24,600	249,900
25	2252	2261	99	101,300	129,300	19,300	249,900

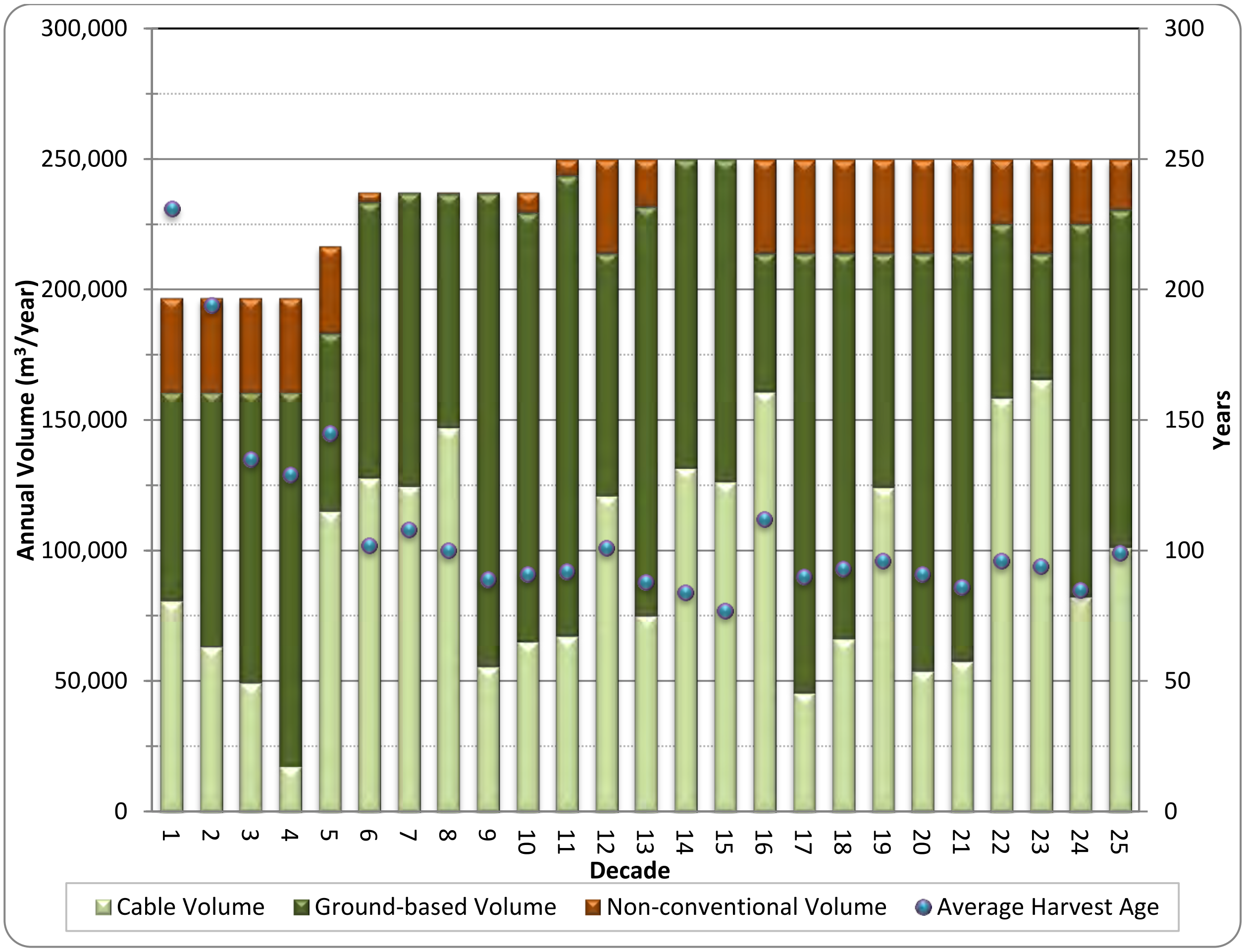

Figure 29 – Block 4 Volume Contribution by Harvesting System

2.1.4 Blocks 3 & 5 Base Case Details

Block 3 is located on North Broughton Island within the Broughton Archipelago (north-east of Port McNeill). It is the smallest of the five supply blocks within TFL 39, comprising about 1.2% of the forested area of TFL 39 and 1.4% of the THLB. Block 5 is located on the mainland coast in the Phillips River watershed, between Knight and Bute Inlets. It contains about 10% of the forested area but only 1.9% of the THLB of TFL 39. Both these blocks are subject to the *South Central Coast Order*. This order implemented Ecosystem-Based Management (EBM) within the southern portion of the area subject to the Central Coast Land Use Decision (2006). There is a similar order for the northern portion; however no portions of TFL 39 fall within that area.

Blocks 3 and 5 are combined for this analysis because they are subject to the same land use objectives and the relatively small timber harvesting land base for each suggests that operationally they will be managed as one supply unit. In MP #8, Block 3 was modeled with Block 4 while Block 5 was modeled on its own. Allocating the current AAC for the combination of Blocks 3 and 4 based on THLB results in an AAC for Block 3 of roughly 30,000 m^3/year. The current AAC contribution for Block 5 is 95,000 m^3/year. Table 17 and Figure 30 present the Base Case harvest schedule for Blocks 3 and 5 combined.

Table 17 – Blocks 3&5 Base Case Harvest Levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3/yr)	% Change from Previous Period
1 - 7	2012	2081	41,300	-67%
8 - 25	2082	2261	45,000	9.0%

Figure 30 – Blocks 3&5 Base Case Harvest Schedule

The Base Case assumptions result in the harvest level for Blocks 3 and 5 declining to 41,300 m^3/year; a reduction of nearly 67% from the current AAC contribution of 125,000 m^3/year. Factors contributing to timber supply decline include:

- New (since the MP #8 analysis) landscape-level reserves and larger riparian management areas to address EBM requirements (refer to Section 7 of the Information Package for details) have significantly reduced available old forest, thereby reducing THLB and the volume of timber available in the short-term.
- Various stand-level retention objectives within the SCCO also reduce the THLB.
- The constraint placed on timber supply contribution from the non-conventional landbase.

The harvest level remains at 41,300 m^3/year for 70 years before increasing to the current estimated long-term harvest level of 45,000 m^3/year. Figure 30 also indicates the harvest split between Block 3 and 5. Over the 250 years, the total harvest is divided between the blocks along the THLB proportions.

Table 18 and Figure 31 indicate the contribution from each of the stand establishment histories to the total harvest volume by period. Old stands contribute 77% of the volume in the first decade, declines significantly to become a minor component of the harvest volume in the following 80 years after which no further current old stands are harvested. In Section 11.3.2 of the Information Package, it was proposed to have immature stands provide one-half of the initial harvest; however, due to the age class distribution of the THLB, this requirement was not enacted.

Table 18 - Stand Types' contribution to Block 3&5 Base Case harvest

			Annual Harvest Volume (m^3)					
Period (Decade #)	Start Year	End Year	Current Old	Current Mature	Natural Second Growth	Current Managed	Future Stands	Total
1	2012	2021	31,700	5,500	4,100	0	0	41,300
2	2022	2031	5,700	0	32,200	3,400	0	41,300
3	2032	2041	5,200	0	27,400	8,700	0	41,300
4	2042	2051	5,400	0	24,500	11,400	0	41,300
5	2052	2061	5,100	0	1,200	35,000	0	41,300
6	2062	2071	4,400	0	600	36,300	0	41,300
7	2072	2081	5,700	300	600	27,200	7,500	41,300
8	2082	2091	5,200	0	500	24,400	14,900	45,000
9	2092	2101	1,900	0	1,200	31,800	10,100	45,000
10	2102	2111	0	0	0	36,600	8,400	45,000
11	2112	2121	0	0	0	11,700	33,300	45,000
12	2122	2131	0	0	0	7,000	38,000	45,000
13	2132	2141	100	0	0	5,500	39,400	45,000
14	2142	2151	0	0	0	2,100	42,900	45,000
15	2152	2161	0	0	0	16,200	28,800	45,000
16	2162	2171	0	0	1,500	29,500	14,000	45,000
17	2172	2181	0	0	0	5,600	39,400	45,000
18	2182	2191	0	0	0	400	44,600	45,000
19	2192	2201	0	0	0	200	44,800	45,000
20	2202	2211	0	0	0	100	44,900	45,000
21	2212	2221	0	0	0	0	45,000	45,000
22	2222	2231	0	0	0	200	44,800	45,000
23	2232	2241	0	0	0	300	44,700	45,000
24	2242	2251	0	0	0	100	44,900	45,000
25	2252	2261	0	0	0	100	44,900	45,000

Natural second growth provides 10% of the volume in the first decade and then about 70% during the next 3 decades. For the rest of the schedule, these stands never provide more than 3% of total timber supply in any decade. Due to the age class distributions within these two blocks, there is very little natural second growth in Block 5 (see the age class distributions in Appendix B of the Information Package); therefore the majority of natural second growth is harvested from Block 3. Current managed second growth contributes the majority of volume beginning in Decade 5 (2052 – 2061) and does so for 60 years. Beginning in the eleventh decade (2112 – 2121), future stands contribute the most volume as the contribution from current managed second growth declines. As in Block 2 and 4, current managed second growth contributes substantial volume during Decade 16 (2162 - 2171). This contribution is from stands that are less than 10 years old in 2012 growing on poor sites and operable by cable systems. The minimum harvest criteria applied dictates that such stands are not available for harvest until this time period.

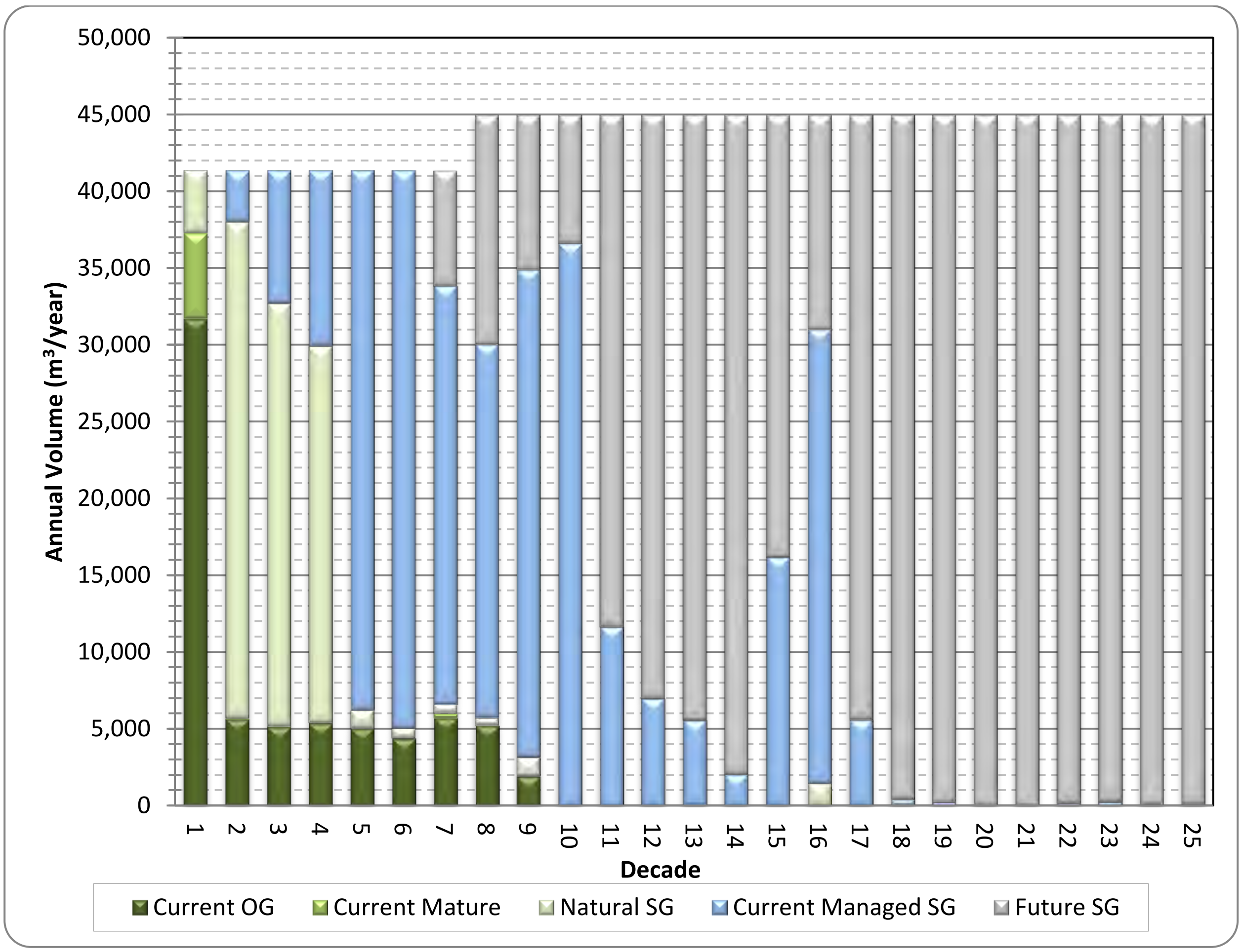

Figure 31 – Stand Types' contribution to Blocks 3&5 Base Case harvest

Age class (refer to Table 6) distributions over time based on the 5-year age groupings used in Woodstock are examined in Figure 32 and Figure 33. Within the productive forest the total area in the oldest age class declines by only 6% over the first 100 years as the small amount of available old growth is harvested. Subsequently the total area of old forest increases as younger reserved timber ages into the old growth age class, reaching 70% of the productive forest area (see Figure 32).

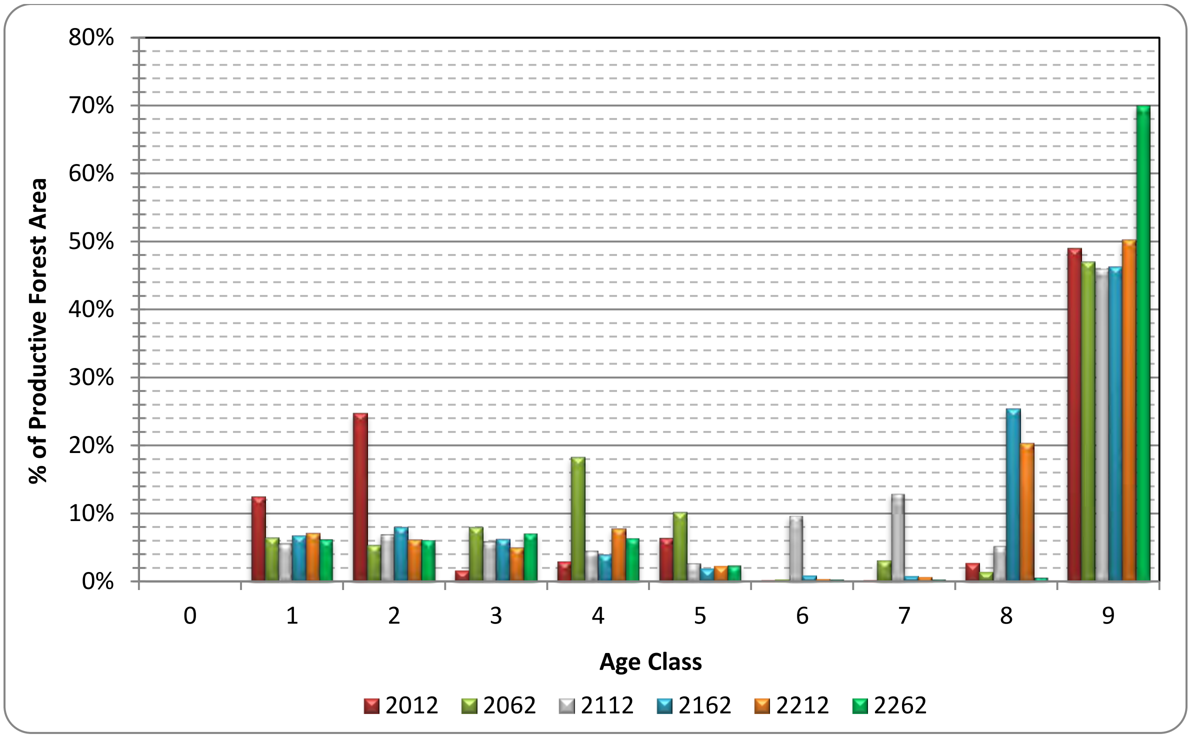

Figure 32 - Age class distribution of Blocks 3&5 productive forest area

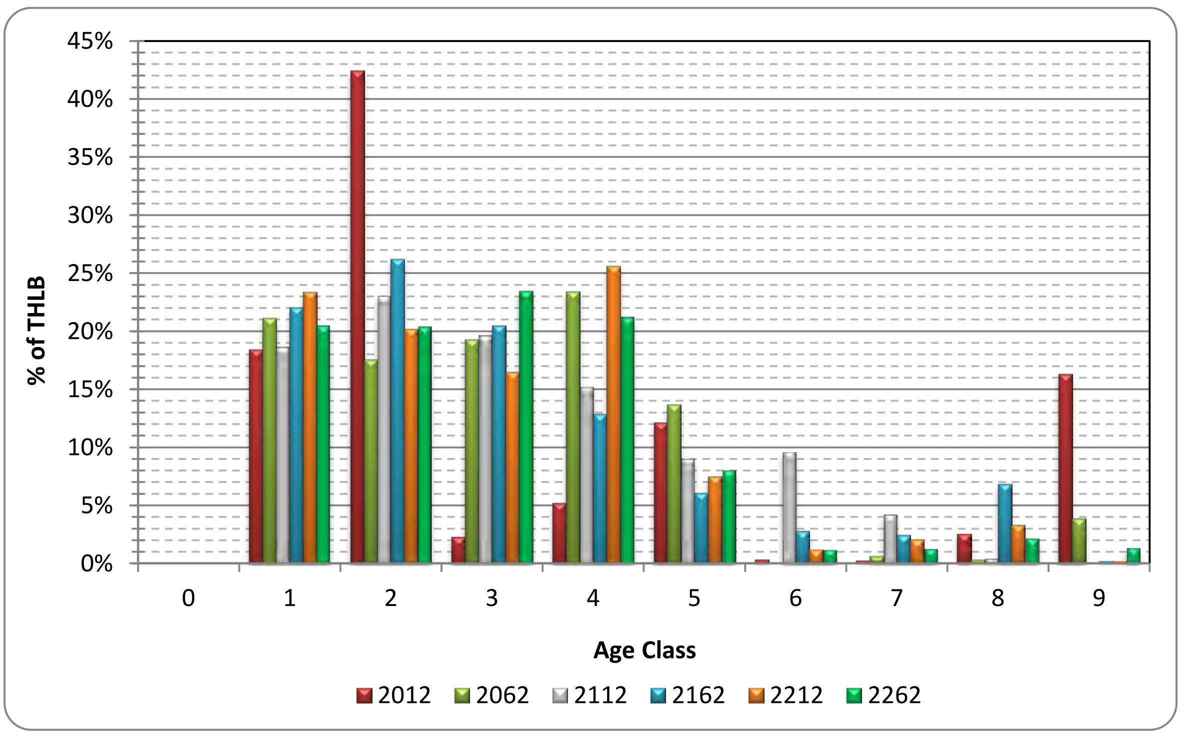

Figure 33 - Age class distribution of Blocks 3&5 THLB

The uneven THLB age class distribution is evident in Figure 33 (refer to 2012 values) with over 60% of the THLB area comprised of stands younger than 41 years old (i.e. less than age class 3). As a result, short-term timber supply is highly dependent on old forest and second growth minimum harvest criteria. The dependence on old forest is indicated by the reduction in age class 8 and 9 within the THLB between 2012 and 2062.

Figure 34 illustrates harvestable (i.e. meets minimum harvest criteria) and total growing stock (including the ground-based / cable / non-conventional split) levels for the combined Block 3 and 5 timber harvesting land base at the beginning of each decade. Total THLB growing stock increases by about 17.5% over the first eight decades as volume is accumulating within the young cable operable stands. Over the remaining 170 years, the THLB growing stock varies between 2 and 2.2 million m^3.

Total conventionally-operable growing stock follows a similar pattern, peaking at 1.9 million m^3 to start the eighth decade (2082 – 2091). It then declines to 1.55 million m^3 to start the sixteenth decade (2162 – 2171) with little variation after that. The model constraint applied forced the amount of conventionally-operable growing stock at the end of the analysis period (i.e. start of Decade 26) to be greater than or equal to the amount at the start of Decade 16. Greater variability is found within the ground-based and cable components of the conventionally-operable inventory. Cable-operable THLB growing stock doubles over the first 60 years as harvesting is concentrated in the ground-based THLB due to its smaller DBH criteria and the large extent of young forest within the THLB discussed earlier. Ground-based volume decreases by 60%, hitting a low of 295,000 m^3 to start the sixth decade (2062 – 2071) and thereafter fluctuating between 180,000 m^3 to start Decade 15 (2152 – 2161) and 800,000 m^3 to start Decade 19 (2192 – 2201)

Non-conventional THLB growing stock declines by roughly 25% over the first 60 years as old stands are harvested and managed second growth stands are relatively young and therefore not accumulating significant volume. During the next 90 years of the schedule, non-conventional THLB growing stock increases as growth exceeds harvest due to the harvest constraint applied to that part of the landbase. Over the final 100 years of the schedule, non-conventional THLB growing stock remains fairly consistent at about 475,000 m^3.

Harvestable volume declines significantly over the first 50 years, creating a timber supply “pinch-point” in Decade 5 and 6 (i.e. 2052 – 2071). After that harvestable volume increases greatly as managed stands reach merchantable size. Once the transition to future stands is complete, harvestable volume fluctuates between 500,000 and 1 million m^3.

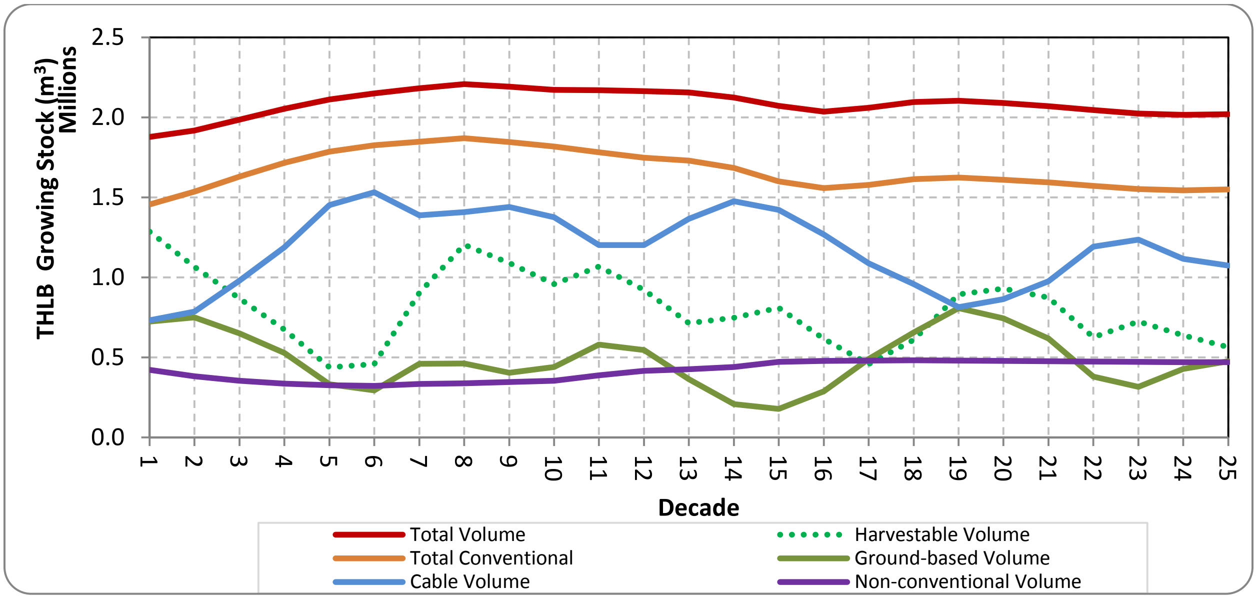

Figure 34 – Blocks 3&5 THLB Growing stock

Figure 35 provides area-weighted average statistics for timber harvested through the harvest projection. As expected, the mean age of stands harvested initially declines rapidly as the contribution of old growth decreases, dropping from 283 years in the first decade to 130 years in the second decade (2022-2031). The average age then gradually declines, reaching a low of 80 years in Decade 14 (2142 – 2151), as harvest transitions to future managed stands. The average age between Decade 15 (2152 – 2161) and Decade 17 (2172 – 2781) breaks the downward trend as harvest during these 30 years is mainly cable-yarding with significant volume sourced from current managed stands. After this period, harvest is almost entirely sourced from future stands and the harvest age averages 96 years.

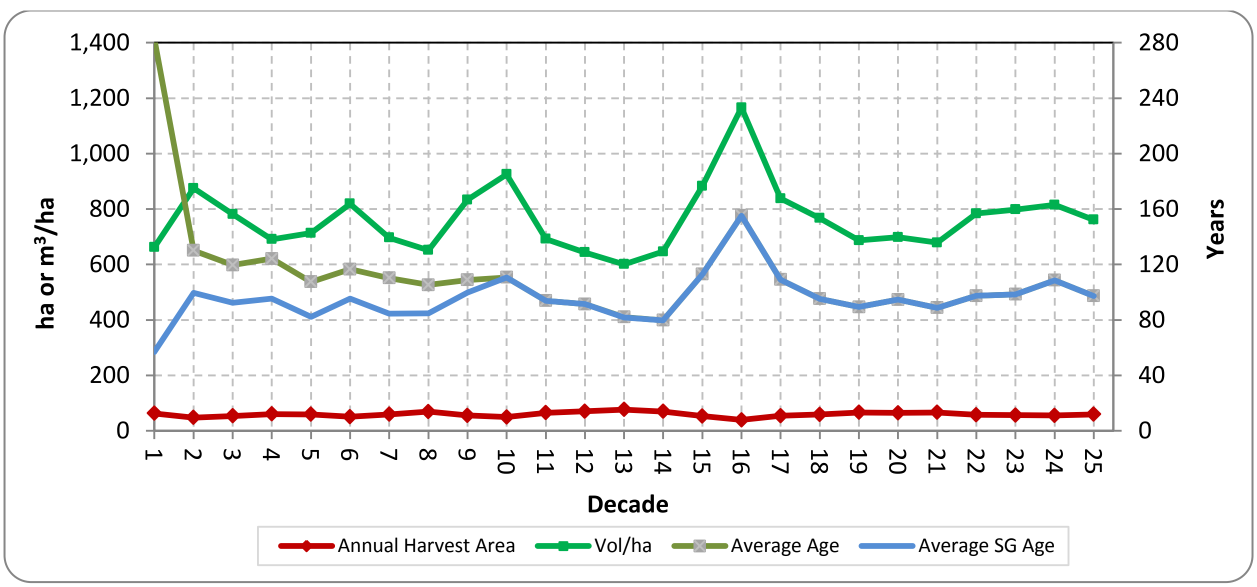

Figure 35 – Blocks 3&5 Harvest Statistics

In absolute terms, annual area harvested varies relatively little; ranging from a low of 39 ha in Decade 16 (2162 – 2171) to a high of 76 ha in Decade 13 (2132 – 2141). In relative terms, this variation is substantial and is due to variability in average volume per hectare harvested. Average volume ranges between 601 m^3/ha in Decade 13 and 1,166 m^3/ha in Decade 16. The peaks in average volume occur when the majority of harvesting is cable-based within current managed stands: Decades 9, 10, 15, 16 and 17. The stands harvested in these decades are comparatively older and therefore have reached high volumes. As the model balances all constraints applicable to the land base, especially the mid-seral and important fisheries watersheds limits, several stands are not harvested until they are 150 years or older. By this age the estimated volume can be well over 1000 m^3/ha based on the managed-stand yield tables detailed in the Information Package. Once harvesting is entirely within future managed stands (Decade 18 and beyond) average area harvested and average volume are 60 ha and 750 m^3/ha respectively.

Table 19 and Figure 36 indicate the contribution by harvesting system to total annual harvest volume and average harvest age. Other than in Decades 6, 10, 11, 13 and 14, non-conventional is maximized at 5,000 m^3/year. As was seen in the other blocks, there is generally a direct relation between the amount of cable harvesting and the average harvest age once the majority of the volume is sourced from managed stands. The significantly older age in Decade 16 discussed earlier is evident.

More details and statistics for the Base Case harvest schedule are presented in Appendix A: Detailed Base Case Harvest Schedule Statistics.

Table 19 – Block 3&5 Base Case Volume Contribution by Harvesting System

				Annual Harvest Volume (m^3)			
Period (Decade #)	Start Year	End Year	Average Harvest Age	Cable Harvesting	Ground-based Harvesting	Non-conventional Harvesting	Total
1	2012	2021	279	22,300	14,000	5,000	41,300
2	2022	2031	132	10,700	25,600	5,000	41,300
3	2032	2041	128	10,500	25,800	5,000	41,300
4	2042	2051	132	5,200	31,200	5,000	41,400
5	2052	2061	116	20,800	15,500	5,000	41,300
6	2062	2071	118	37,100	200	4,000	41,300
7	2072	2081	119	18,700	17,600	5,000	41,300
8	2082	2091	118	20,000	20,000	5,000	45,000
9	2092	2101	116	30,100	9,900	5,000	45,000
10	2102	2111	113	39,700	2,600	2,700	45,000
11	2112	2121	98	22,400	19,300	3,300	45,000
12	2122	2131	94	8,800	31,200	5,000	45,000
13	2132	2141	89	14,900	25,900	4,200	45,000
14	2142	2151	85	29,100	13,400	2,500	45,000
15	2152	2161	120	36,300	3,700	5,000	45,000
16	2162	2171	163	40,000	0	5,000	45,000
17	2172	2181	114	35,500	4,500	5,000	45,000
18	2182	2191	98	36,400	3,600	5,000	45,000
19	2192	2201	94	18,100	21,900	5,000	45,000
20	2202	2211	100	15,600	24,400	5,000	45,000

				Annual Harvest Volume (m^3)			
Period (Decade #)	Start Year	End Year	Average Harvest Age	Cable Harvesting	Ground-based Harvesting	Non-conventional Harvesting	Total
21	2212	2221	94	7,100	32,900	5,000	45,000
22	2222	2231	101	22,900	17,100	5,000	45,000
23	2232	2241	102	35,100	4,900	5,000	45,000
24	2242	2251	112	26,100	13,900	5,000	45,000
25	2252	2261	100	32,900	7,100	5,000	45,000

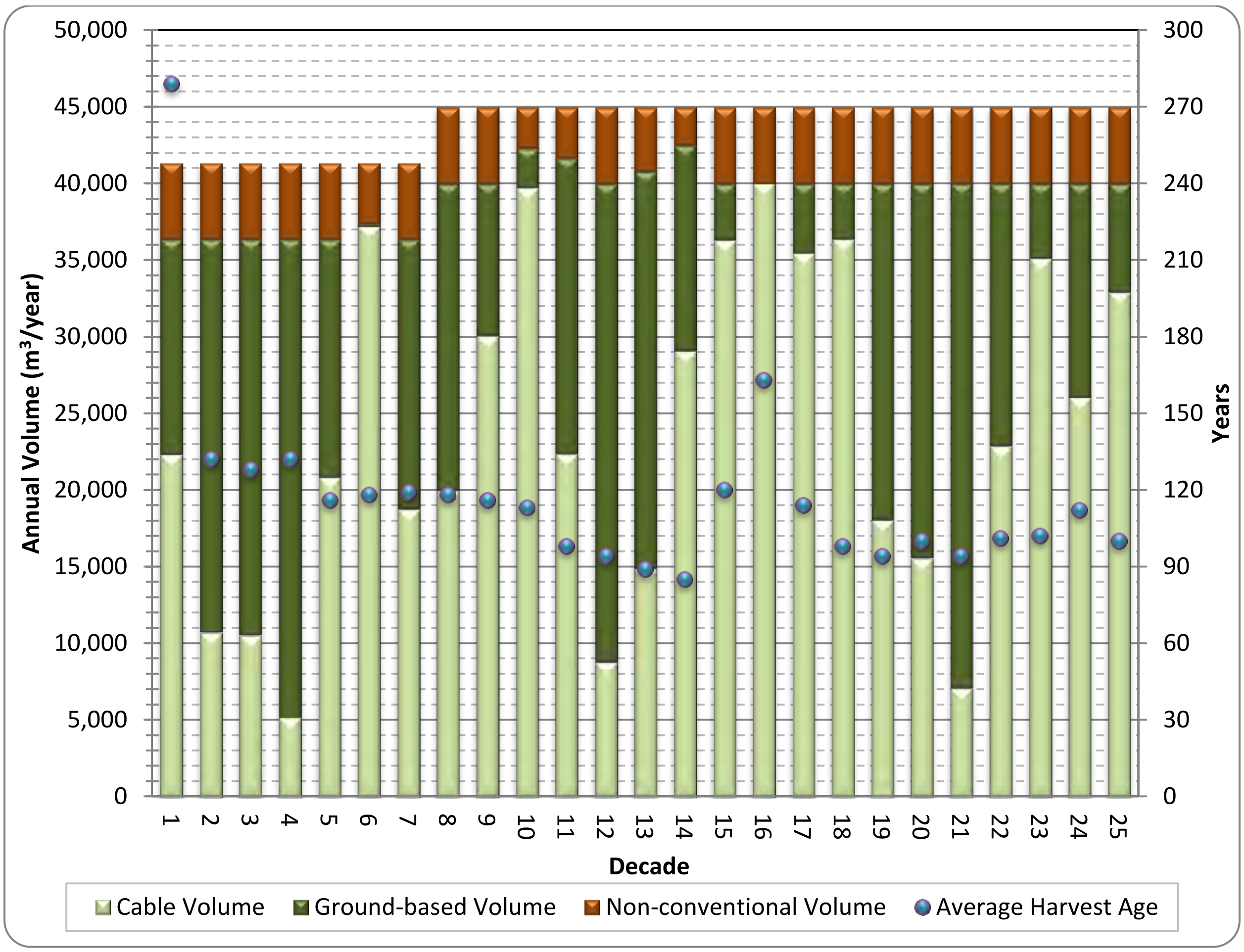

Figure 36 – Blocks 3&5 Volume Contribution by Harvesting System

2.2 Western Red Cedar Projections

Traditional and cultural uses of cedar are important to First Nations. Opportunities for accessing and managing cedar have been increased through the granting of tenures to First Nations and treaty processes. Within TFL 39 there is a significant volume of cedar. Table 20 - Table 25 and Figure 37 - Figure 42 indicate the estimated volume of cedar by supply block and overall. Blocks 3 and 5 are shown separately due to different overlapping first nation territories. Volumes are differentiated by land base description (THLB and non-contributing) and, in the tables, by three broad age-classes (less than 140 years old, 140-250 years old, greater than 250 years old). These broad age-classes are meant to reflect the general likelihood of stands containing large cultural cedar: stands less than 140 years old will have a low probability of containing large cultural cedar while stands greater than 250 years old have a high probability of containing large cultural cedar.

The figures only indicate the total cedar volume and the total volume within the THLB. The volume within the non-contributing land base is the amount of volume “above” the line representing the THLB volume.

Table 20 – Block 1 Base Case cedar volume (m^3) estimates over time

	THLB				Non-Contributing Land Base				Total			
Decade	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total
1	628,794	117,848	2,105,661	2,852,303	730,096	87,900	860,007	1,678,003	1,358,890	205,747	2,965,669	4,530,306
2	594,827	27,852	2,178,401	2,801,080	797,878	28,012	1,002,480	1,828,370	1,392,704	55,864	3,180,882	4,629,450
3	514,942	32,928	2,171,537	2,719,407	797,878	63,072	1,122,036	1,982,985	1,312,819	96,000	3,293,573	4,702,392
4	416,969	74,579	2,157,159	2,648,707	802,031	163,820	1,165,809	2,131,661	1,219,000	238,400	3,322,968	4,780,367
5	397,144	187,176	2,127,699	2,712,020	802,031	452,063	1,012,672	2,266,767	1,199,175	639,239	3,140,372	4,978,786
6	308,723	261,740	2,242,730	2,813,192	806,277	692,408	888,300	2,386,984	1,115,000	954,147	3,131,029	5,200,176
7	274,245	298,906	2,263,382	2,836,533	811,608	834,034	845,415	2,491,057	1,085,853	1,132,940	3,108,798	5,327,590
8	197,676	240,167	2,351,729	2,789,572	811,608	947,456	821,392	2,580,456	1,009,284	1,187,623	3,173,121	5,370,028
9	149,164	230,123	2,329,540	2,708,827	811,734	1,104,442	742,265	2,658,441	960,898	1,334,565	3,071,805	5,367,268
10	96,701	248,114	2,334,259	2,679,074	811,861	1,243,569	670,970	2,726,399	908,562	1,491,683	3,005,228	5,405,473
11	78,138	229,520	2,327,021	2,634,679	813,647	1,359,727	609,901	2,783,276	891,785	1,589,247	2,936,923	5,417,955
12	75,261	200,717	2,332,861	2,608,838	817,996	1,597,046	415,262	2,830,304	893,257	1,797,763	2,748,123	5,439,143
13	59,507	166,447	2,431,074	2,657,028	826,881	1,776,193	266,784	2,869,858	886,388	1,942,640	2,697,859	5,526,886
14	54,894	179,987	2,504,177	2,739,058	867,340	1,930,680	105,543	2,903,563	922,234	2,110,667	2,609,720	5,642,621
15	66,684	195,072	2,368,161	2,629,917	987,836	1,913,696	29,974	2,931,506	1,054,520	2,108,768	2,398,135	5,561,423
16	89,849	172,742	2,245,897	2,508,488	1,310,194	1,643,753	0	2,953,947	1,400,043	1,816,495	2,245,897	5,462,435
17	90,816	127,443	2,312,717	2,530,975	1,572,873	1,398,073	0	2,970,946	1,663,688	1,525,517	2,312,717	5,501,921
18	83,147	140,381	2,317,225	2,540,754	1,718,245	1,264,102	0	2,982,347	1,801,392	1,404,484	2,317,225	5,523,101
19	77,044	167,998	2,443,941	2,688,984	1,825,141	1,163,917	0	2,989,058	1,902,185	1,331,915	2,443,941	5,678,042
20	68,048	183,426	2,508,731	2,760,205	1,986,033	1,006,638	0	2,992,671	2,054,081	1,190,064	2,508,731	5,752,876
21	62,366	203,469	2,487,315	2,753,150	2,122,879	871,716	0	2,994,595	2,185,245	1,075,185	2,487,315	5,747,745
22	53,830	210,741	2,352,486	2,617,057	2,234,861	761,032	0	2,995,893	2,288,691	971,774	2,352,486	5,612,951
23	49,348	250,400	2,319,450	2,619,198	2,491,296	505,649	0	2,996,945	2,540,645	756,049	2,319,450	5,616,143
24	44,983	277,001	2,247,803	2,569,786	2,683,345	314,451	0	2,997,796	2,728,328	591,452	2,247,803	5,567,583
25	51,922	275,126	2,307,309	2,634,357	2,880,107	118,170	0	2,998,277	2,932,030	393,295	2,307,309	5,632,634

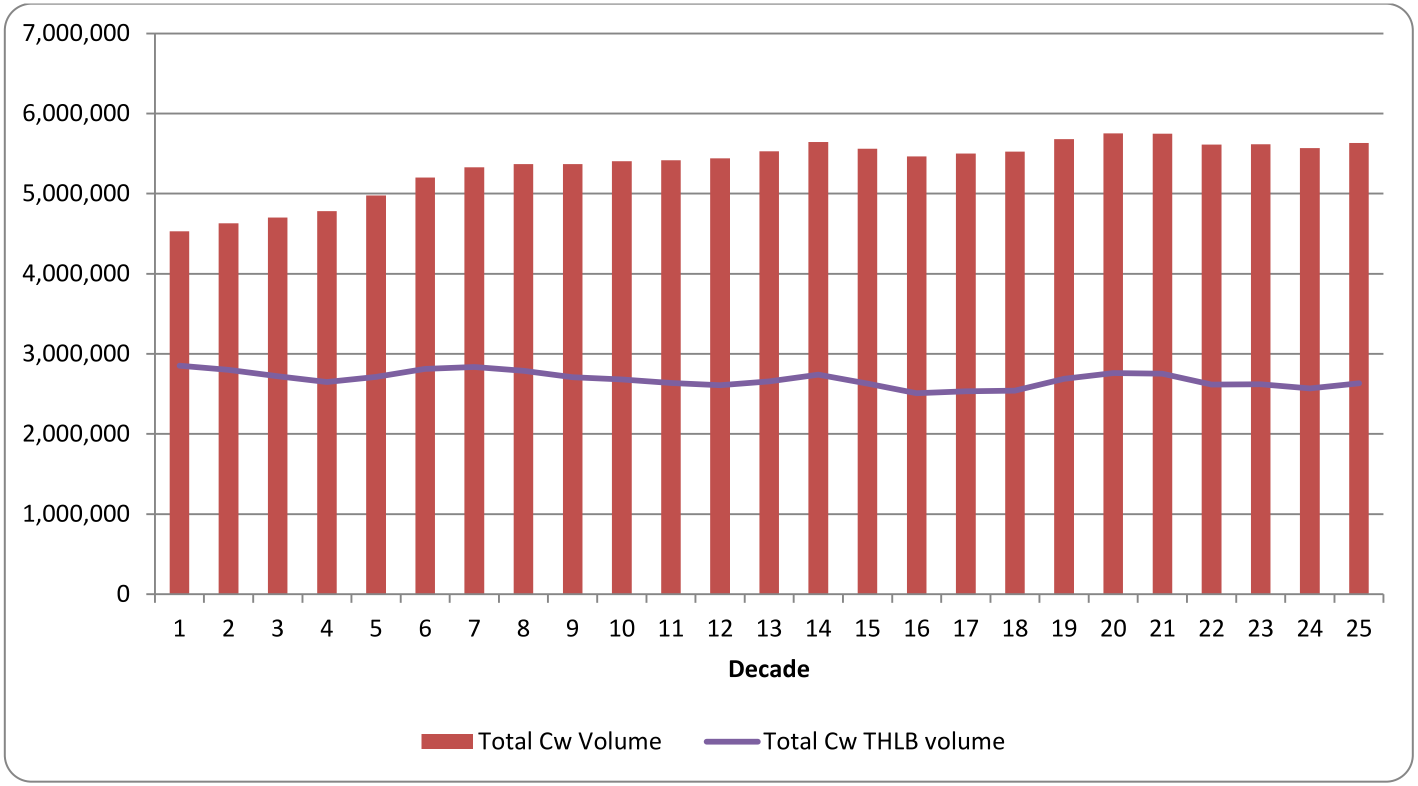

Figure 37 - Block 1 Base Case cedar volume (m^3) estimates over time

Within Block 1, the total cedar volume on the THLB varies little, but the age class distribution shifts towards the younger classes. Total cedar volume increases over time as the cedar within the non-contributing land base ages and accumulates volume.

Table 21 – Block 2 Base Case cedar volume (m^3) estimates over time

Decade	THLB				Non-Contributing Land Base				Total			
	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total
1	1,072,523	103,125	614,685	1,790,333	1,356,131	81,956	144,283	1,582,369	2,428,654	185,081	758,967	3,372,702
2	733,171	27,565	805,501	1,566,237	1,402,640	38,182	198,346	1,639,168	2,135,811	65,747	1,003,847	3,205,405
3	534,572	22,613	991,791	1,548,976	1,402,640	38,818	260,952	1,702,411	1,937,212	61,431	1,252,743	3,251,386
4	500,868	14,932	1,054,524	1,570,324	1,424,277	21,121	324,173	1,769,572	1,925,145	36,053	1,378,698	3,339,896
5	462,260	15,744	1,251,359	1,729,364	1,424,277	26,057	383,291	1,833,625	1,886,537	41,801	1,634,650	3,562,989
6	403,746	13,002	1,296,918	1,713,667	1,431,713	24,791	435,758	1,892,262	1,835,459	37,793	1,732,676	3,605,929
7	374,867	24,824	1,323,361	1,723,052	1,438,087	42,255	465,124	1,945,466	1,812,954	67,079	1,788,485	3,668,518
8	326,562	21,505	1,408,569	1,756,636	1,438,087	65,690	489,672	1,993,449	1,764,649	87,195	1,898,241	3,750,085
9	306,927	26,919	1,529,206	1,863,052	1,438,087	117,181	480,904	2,036,172	1,745,013	144,100	2,010,110	3,899,224
10	295,141	38,757	1,484,562	1,818,460	1,438,087	183,290	452,531	2,073,908	1,733,228	222,047	1,937,093	3,892,368
11	290,557	39,104	1,450,874	1,780,536	1,438,087	305,995	362,669	2,106,751	1,728,644	345,099	1,813,544	3,887,287
12	290,036	43,846	1,296,411	1,630,293	1,438,087	416,275	280,258	2,134,619	1,728,122	460,121	1,576,669	3,764,912
13	288,770	41,762	1,218,308	1,548,841	1,441,468	532,531	183,573	2,157,571	1,730,238	574,292	1,401,881	3,706,412
14	286,899	63,044	1,164,433	1,514,376	1,442,139	607,279	127,587	2,177,005	1,729,038	670,323	1,292,020	3,691,381
15	287,185	181,055	1,097,229	1,565,469	1,446,915	740,318	6,130	2,193,363	1,734,100	921,372	1,103,359	3,758,832
16	287,072	179,996	1,078,413	1,545,481	1,452,766	755,048	0	2,207,814	1,739,838	935,044	1,078,413	3,753,295
17	290,396	50,048	1,204,909	1,545,353	1,459,743	761,032	0	2,220,776	1,750,140	811,080	1,204,909	3,766,129
18	281,777	27,626	1,212,369	1,521,772	1,488,842	743,046	0	2,231,888	1,770,619	770,673	1,212,369	3,753,660
19	277,213	27,382	1,203,860	1,508,455	1,517,260	724,076	0	2,241,337	1,794,473	751,459	1,203,860	3,749,792
20	272,484	21,126	1,096,750	1,390,360	1,578,647	670,915	0	2,249,562	1,851,131	692,041	1,096,750	3,639,922
21	269,342	23,566	1,067,263	1,360,172	1,657,613	599,125	0	2,256,738	1,926,956	622,691	1,067,263	3,616,910
22	266,954	27,799	1,200,194	1,494,948	1,795,287	467,221	0	2,262,508	2,062,240	495,021	1,200,194	3,757,456
23	266,845	32,024	1,164,273	1,463,142	1,913,635	353,420	0	2,267,055	2,180,480	385,444	1,164,273	3,730,197
24	266,658	36,053	1,228,203	1,530,913	2,040,180	229,812	0	2,269,992	2,306,838	265,865	1,228,203	3,800,905
25	266,999	39,135	1,192,819	1,498,952	2,117,942	153,748	0	2,271,689	2,384,941	192,883	1,192,819	3,770,642

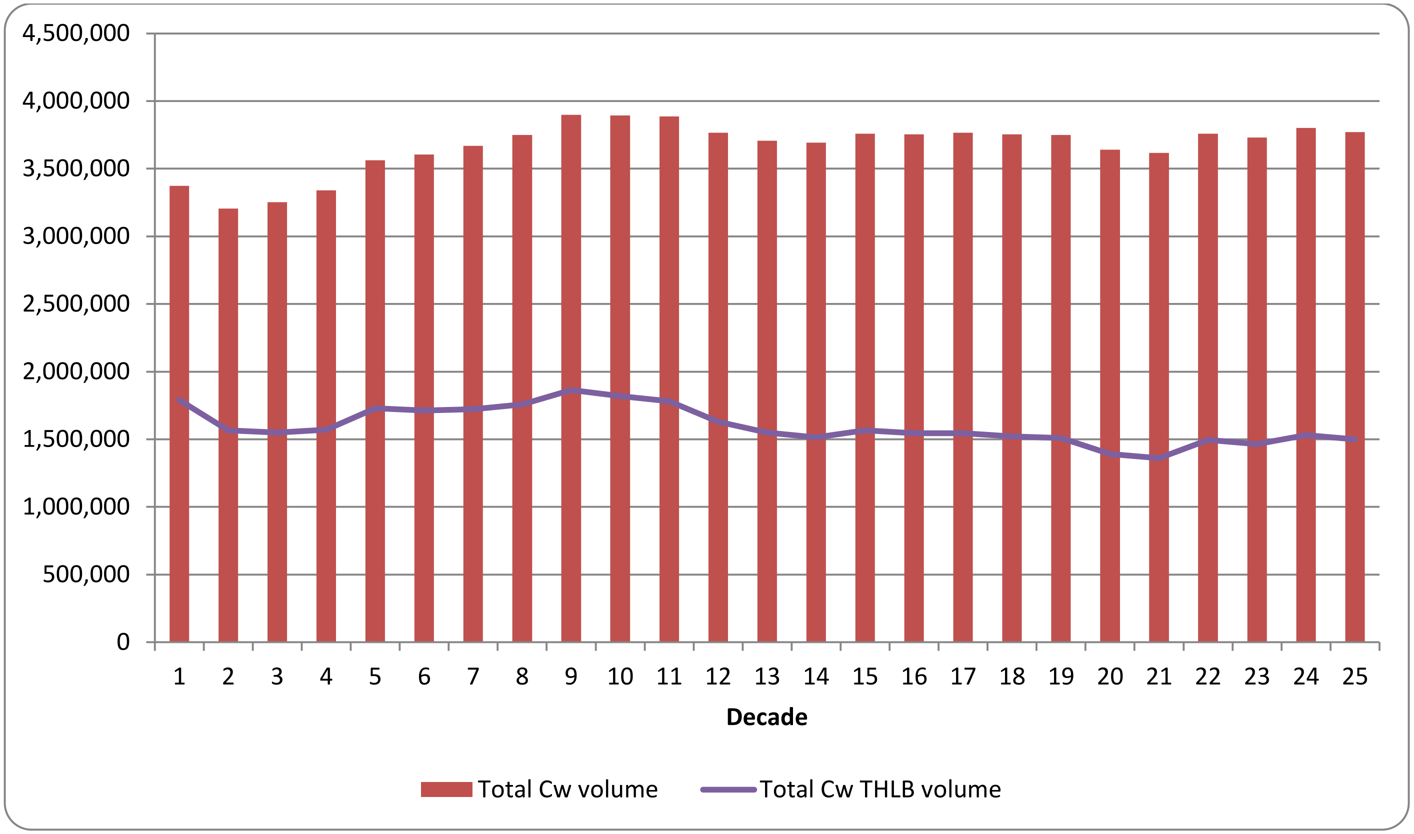

Figure 38 - Block 2 Base Case cedar volume (m^3) estimates over time

Within Block 2, the total amount of cedar is forecast to initially decline by roughly 5% but then to increase to nearly 4 million m^3 (15% more than current estimates). The amount of cedar within the THLB is forecast to fluctuate between 1.45 million m^3 and 1.8 million m^3 but shift to the younger age class. Within the non-contributing land base the amount of old cedar is projected to increase by more than 50%, to over 2 million m^3.

Table 22 – Block 3 Base Case cedar volume (m^3) estimates over time

Decade	THLB				Non-Contributing Land Base				Total			
	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total
1	103,238	658	164,284	268,180	132,821	40	96,810	229,671	236,059	698	261,094	497,851
2	4,949	0	228,775	233,724	132,861	0	135,717	268,577	137,810	0	364,492	502,302
3	3,381	0	289,965	293,346	132,861	0	177,688	310,548	136,241	0	467,653	603,894
4	2,950	0	315,795	318,745	132,861	54	218,941	351,856	135,811	54	534,735	670,601
5	552	0	279,807	280,359	132,861	3,563	253,750	390,173	133,413	3,563	533,557	670,532
6	552	0	263,862	264,414	132,861	10,494	281,456	424,811	133,413	10,494	545,318	689,225
7	552	2,642	351,209	354,403	132,861	63,509	260,082	456,452	133,413	66,151	611,291	810,855
8	137	5,387	405,135	410,659	132,861	124,381	228,532	485,773	132,998	129,768	633,667	896,433
9	0	5,823	412,107	417,930	132,861	134,048	245,893	512,802	132,861	139,870	658,001	930,732
10	0	3,445	422,570	426,015	132,861	142,606	261,568	537,034	132,861	146,051	684,137	963,049
11	0	3,594	458,525	462,118	132,861	156,439	268,167	557,468	132,861	160,033	726,692	1,019,586
12	0	3,734	394,024	397,758	132,861	309,504	132,228	574,593	132,861	313,238	526,252	972,350
13	0	104,460	199,028	303,488	132,861	440,371	16,834	590,066	132,861	544,831	215,862	893,553
14	0	111,487	145,082	256,569	132,861	460,003	12,017	604,881	132,861	571,490	157,099	861,450
15	0	131,143	162,807	293,950	132,926	484,978	0	617,904	132,926	616,121	162,807	911,854
16	0	54,293	230,384	284,677	137,287	492,002	0	629,288	137,287	546,295	230,384	913,965
17	0	16,512	316,552	333,064	145,431	493,628	0	639,059	145,431	510,140	316,552	972,123
18	0	17,091	403,886	420,977	211,969	435,764	0	647,734	211,969	452,856	403,886	1,068,711
19	0	16,800	440,483	457,282	285,614	370,353	0	655,967	285,614	387,153	440,483	1,113,250
20	0	17,218	406,695	423,913	291,804	372,315	0	664,119	291,804	389,534	406,695	1,088,033
21	0	17,219	280,075	297,294	296,727	374,730	0	671,456	296,727	391,949	280,075	968,750
22	0	17,220	199,320	216,540	309,612	368,732	0	678,344	309,612	385,952	199,320	894,884
23	0	17,220	218,732	235,953	506,102	178,264	0	684,366	506,102	195,484	218,732	920,319
24	34	17,187	280,159	297,380	668,193	21,579	0	689,773	668,227	38,766	280,159	987,153
25	34	17,187	331,439	348,660	679,771	14,374	0	694,145	679,805	31,561	331,439	1,042,805

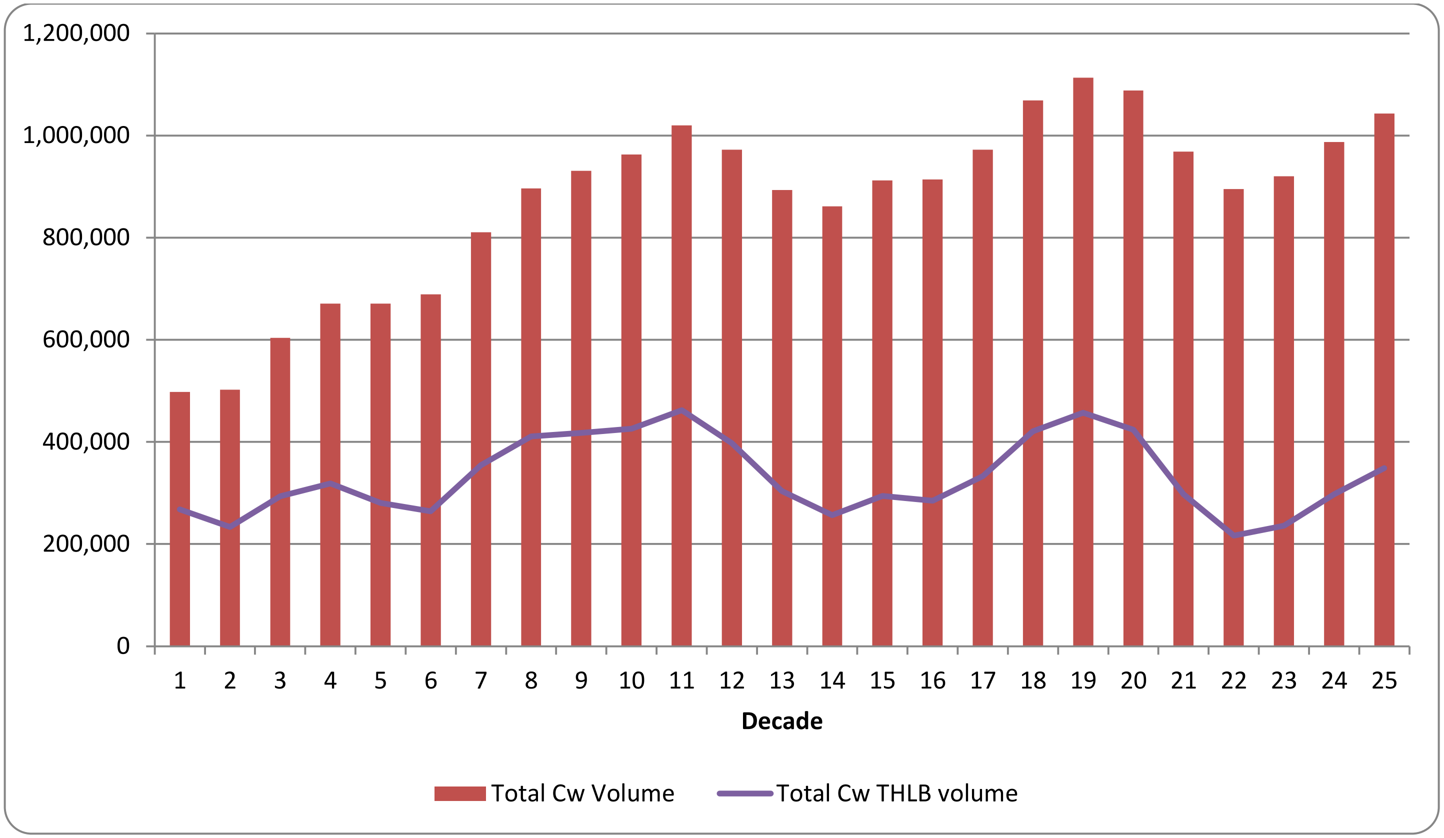

Figure 39 - Block 3 Base Case cedar volume (m^3) estimates over time

With the SCCO objectives constraining a significant portion of the forested area, the amount of cedar within the non-contributing land base is expected to increase greatly over time; however, the amount of old cedar does not increase until 160 years from now due to the generally young forest found within Block 3. The amount of cedar within the THLB fluctuates as contribution to the Base Case harvest schedule fluctuates between Block 3 and Block 5.

Table 23 – Block 4 Base Case cedar volume (m^3) estimates over time

Decade	THLB				Non-Contributing Land Base				Total			
	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total
1	346,467	45,762	385,965	778,194	273,167	28,826	86,187	388,180	619,634	74,588	472,152	1,166,374
2	139,464	790	598,856	739,111	300,383	1,610	134,838	436,831	439,847	2,400	733,695	1,175,942
3	85,106	355	807,816	893,277	300,383	1,615	187,815	489,813	385,489	1,970	995,630	1,383,090
4	58,595	362	882,808	941,764	300,625	1,384	241,265	543,274	359,219	1,746	1,124,073	1,485,038
5	52,509	452	980,644	1,033,605	300,625	1,918	291,274	593,816	353,134	2,370	1,271,918	1,627,421
6	8,561	246	1,106,850	1,115,656	301,276	3,842	334,655	639,772	309,837	4,087	1,441,505	1,755,429
7	2,814	214	1,177,818	1,180,845	301,448	4,461	375,093	681,002	304,262	4,674	1,552,910	1,861,847
8	2,814	3,470	1,258,440	1,264,723	301,448	8,156	408,201	717,806	304,262	11,626	1,666,641	1,982,529
9	2,814	10,074	1,359,755	1,372,642	301,800	28,849	419,671	750,320	304,614	38,923	1,779,426	2,122,963
10	2,813	15,028	1,676,310	1,694,152	301,800	97,978	379,723	779,501	304,614	113,007	2,056,033	2,473,653
11	1,790	15,644	1,736,052	1,753,486	301,800	167,768	335,767	805,336	303,590	183,412	2,071,820	2,558,822
12	1,790	16,321	1,677,273	1,695,383	301,992	294,259	232,049	828,301	303,782	310,580	1,909,322	2,523,684
13	1,855	16,892	1,611,996	1,630,743	301,993	413,258	133,649	848,899	303,848	430,150	1,745,645	2,479,643
14	1,855	35,070	1,481,402	1,518,327	301,999	514,622	50,987	867,609	303,854	549,693	1,532,389	2,385,936
15	1,868	119,075	1,351,315	1,472,258	302,012	576,628	6,130	884,770	303,879	695,703	1,357,445	2,357,028
16	1,868	119,848	1,441,933	1,563,649	302,646	597,250	0	899,895	304,513	717,098	1,441,933	2,463,545
17	1,803	64,551	1,495,722	1,562,075	305,667	606,210	0	911,877	307,470	670,761	1,495,722	2,473,952
18	1,530	56,152	1,464,250	1,521,933	306,466	613,900	0	920,367	307,997	670,052	1,464,250	2,442,299
19	25	68,914	1,422,870	1,491,809	310,842	614,693	0	925,535	310,867	683,607	1,422,870	2,417,344
20	33	79,790	1,363,563	1,443,385	336,447	591,208	0	927,655	336,479	670,998	1,363,563	2,371,040
21	92	61,042	1,328,401	1,389,536	419,550	508,385	0	927,935	419,642	569,428	1,328,401	2,317,471
22	92	39,238	1,505,584	1,544,915	494,600	433,450	0	928,050	494,692	472,689	1,505,584	2,472,965
23	92	31,904	1,565,963	1,597,959	634,858	293,298	0	928,157	634,951	325,202	1,565,963	2,526,116
24	92	21,045	1,599,623	1,620,760	762,906	165,344	0	928,250	762,999	186,389	1,599,623	2,549,010
25	4,219	16,935	1,487,054	1,508,208	866,194	62,141	0	928,335	870,413	79,076	1,487,054	2,436,543

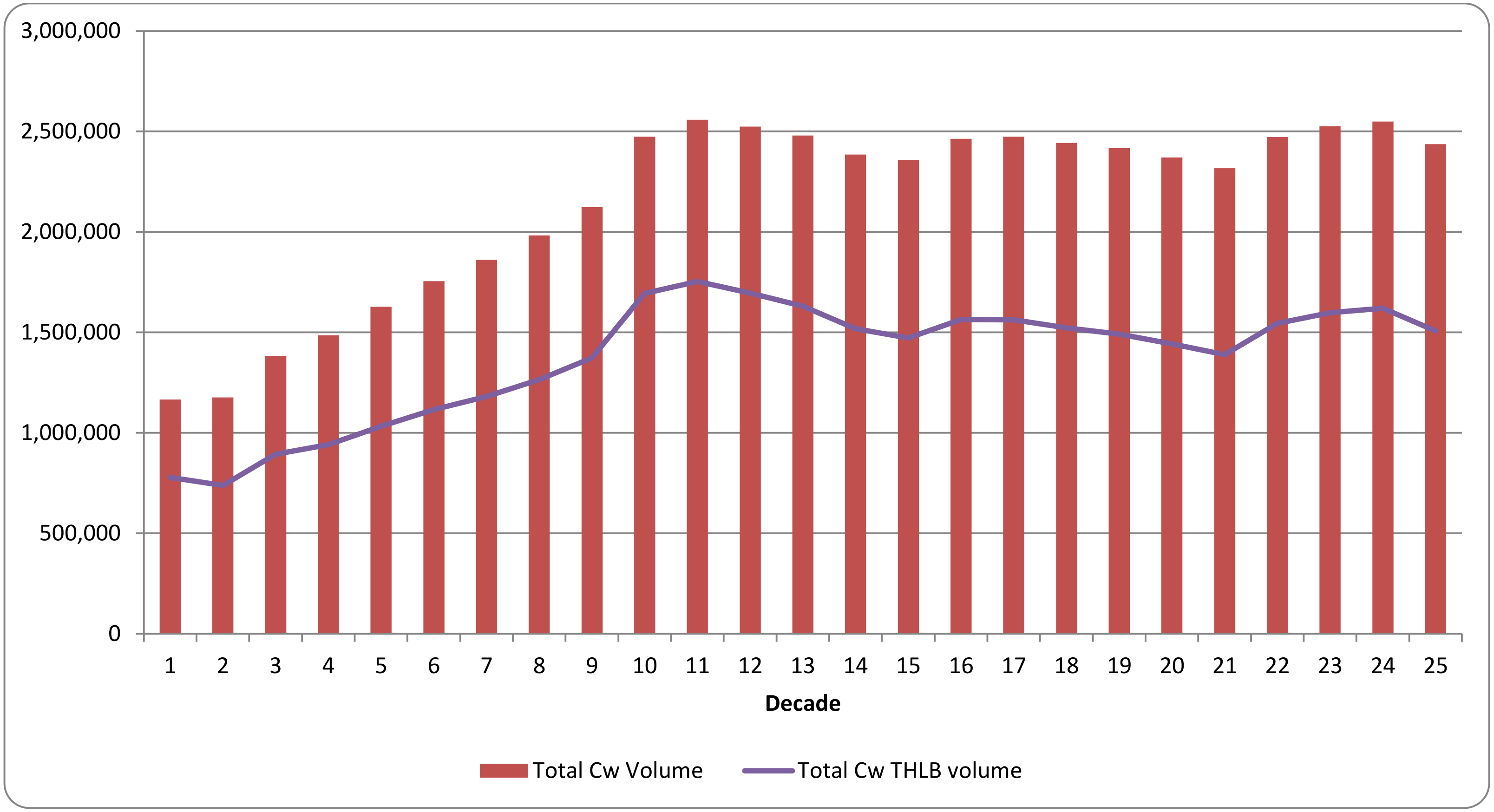

Figure 40 - Block 4 Base Case cedar volume (m^3) estimates over time

The forest within Block 4 is generally a Hemlock-Balsam (HemBal) forest with the majority of cedar found within managed stands in the THLB. Thus it is generally young.

Table 24 – Block 5 Base Case cedar volume (m^3) estimates over time

Decade	THLB				Non-Contributing Land Base				Total			
	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total
1	88,517	9,792	61,341	159,650	1,007,257	36,957	71,178	1,115,392	1,095,775	46,748	132,519	1,275,042
2	67,535	120	121,730	189,385	1,037,926	6,288	142,108	1,186,322	1,105,461	6,409	263,837	1,375,707
3	55,567	170	187,593	243,330	1,037,926	6,924	226,776	1,271,625	1,093,493	7,094	414,369	1,514,955
4	43,169	169	247,514	290,852	1,039,653	5,221	313,072	1,357,945	1,082,821	5,390	560,586	1,648,798
5	34,140	173	315,848	350,160	1,039,653	5,242	393,452	1,438,346	1,073,792	5,414	709,300	1,788,507
6	27,173	197	330,861	358,231	1,042,483	6,721	462,455	1,511,659	1,069,656	6,918	793,316	1,869,891
7	20,759	117	304,022	324,898	1,043,602	6,706	526,201	1,576,509	1,064,361	6,823	830,223	1,901,407
8	10,014	419	370,795	381,229	1,043,602	7,291	582,189	1,633,082	1,053,616	7,710	952,984	2,014,310
9	2,673	58	404,725	407,456	1,043,602	8,095	632,819	1,684,515	1,046,275	8,153	1,037,544	2,091,971
10	58	17	399,734	399,809	1,043,602	8,334	679,575	1,731,511	1,043,660	8,352	1,079,308	2,131,320
11	58	18	378,242	378,318	1,043,961	22,675	705,794	1,772,430	1,044,019	22,693	1,084,036	2,150,748
12	58	284	441,735	442,077	1,044,214	191,011	573,400	1,808,625	1,044,272	191,295	1,015,135	2,250,702
13	58	7,834	515,294	523,186	1,044,214	507,313	290,397	1,841,924	1,044,272	515,147	805,691	2,365,110
14	0	16,474	534,673	551,148	1,044,945	741,837	85,241	1,872,023	1,044,945	758,311	619,915	2,423,171
15	0	32,125	444,868	476,993	1,044,945	853,223	0	1,898,169	1,044,945	885,348	444,868	2,375,162
16	0	35,012	414,237	449,249	1,044,945	875,908	0	1,920,853	1,044,945	910,920	414,237	2,370,102
17	0	25,274	474,048	499,322	1,049,801	891,190	0	1,940,990	1,049,801	916,464	474,048	2,440,312
18	0	30,997	443,858	474,854	1,050,859	906,422	0	1,957,281	1,050,859	937,419	443,858	2,432,135
19	0	34,731	405,174	439,905	1,051,302	915,560	0	1,966,862	1,051,302	950,292	405,174	2,406,767
20	0	39,195	426,410	465,605	1,052,008	918,327	0	1,970,334	1,052,008	957,522	426,410	2,435,939
21	0	40,550	535,588	576,138	1,052,136	920,158	0	1,972,294	1,052,136	960,708	535,588	2,548,433
22	0	44,544	597,788	642,332	1,068,691	904,508	0	1,973,198	1,068,691	949,052	597,788	2,615,531
23	0	45,869	560,618	606,487	1,261,778	711,873	0	1,973,651	1,261,778	757,742	560,618	2,580,138
24	0	51,165	496,870	548,035	1,618,318	355,749	0	1,974,068	1,618,318	406,914	496,870	2,522,103
25	186	53,182	468,477	521,845	1,869,579	104,847	0	1,974,426	1,869,765	158,029	468,477	2,496,271

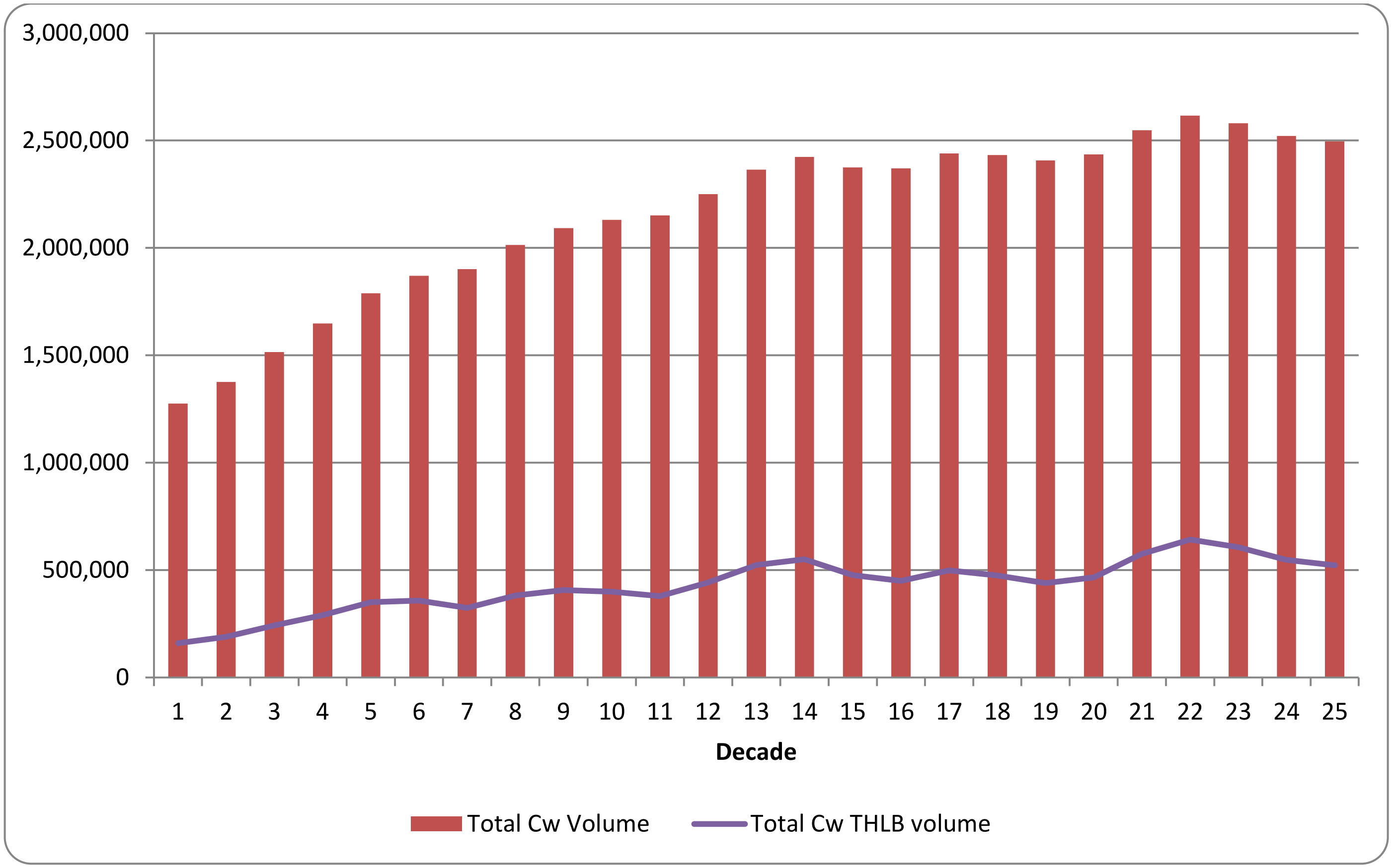

Figure 41 - Block 5 Base Case cedar volume (m^3) estimates over time

With the SCCO objectives constraining a significant portion of the old forest area, there is significant volume of old cedar within the non-contributing land base and it is expected to increase over time as younger reserved forest ages. The amount of cedar within the THLB increases over time as managed stands age.

Table 25 – TFL 39 Base Case cedar volume (m^3) estimates over time

Decade	THLB				Non-Contributing Land Base				Total			
	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total	> 250 yrs old	140-250 yrs old	< 140 yrs old	Total
1	2,239,539	277,185	3,331,936	5,848,660	3,282,797	212,606	1,196,842	4,692,246	5,522,337	489,791	4,528,778	10,540,906
2	1,584,283	56,246	3,936,027	5,576,556	3,433,138	72,895	1,519,192	5,025,225	5,017,422	129,141	5,455,219	10,601,781
3	1,230,726	55,982	4,441,346	5,728,054	3,433,138	109,227	1,846,026	5,388,392	4,663,864	165,209	6,287,372	11,116,446
4	1,073,472	89,881	4,651,337	5,814,690	3,460,664	190,624	2,099,354	5,750,642	4,534,135	280,505	6,750,691	11,565,332
5	994,870	203,700	4,951,380	6,149,949	3,460,664	487,441	2,138,240	6,086,344	4,455,533	691,141	7,089,620	12,236,294
6	774,543	277,492	5,235,551	6,287,585	3,475,415	735,294	2,178,758	6,389,467	4,249,958	1,012,786	7,414,309	12,677,053
7	696,725	329,183	5,450,129	6,476,037	3,488,263	947,511	2,222,216	6,657,990	4,184,989	1,276,694	7,672,345	13,134,027
8	556,051	283,813	5,847,830	6,687,694	3,488,263	1,146,781	2,259,482	6,894,526	4,044,315	1,430,595	8,107,311	13,582,221
9	477,882	316,741	6,076,758	6,871,382	3,488,437	1,370,146	2,246,809	7,105,391	3,966,319	1,686,887	8,323,567	13,976,773
10	411,020	363,902	6,336,081	7,111,002	3,488,564	1,600,620	2,203,583	7,292,766	3,899,583	1,964,522	8,539,663	14,403,769
11	387,779	354,181	6,345,550	7,087,510	3,490,710	1,887,203	2,075,192	7,453,104	3,878,488	2,241,384	8,420,742	14,540,614
12	384,379	334,290	6,153,293	6,871,963	3,495,404	2,603,277	1,490,888	7,589,569	3,879,783	2,937,567	7,644,182	14,461,532
13	367,426	444,572	5,956,293	6,768,290	3,507,670	3,387,310	813,263	7,708,242	3,875,095	3,831,882	6,769,556	14,476,533
14	360,884	596,258	5,737,448	6,694,589	3,549,532	3,911,691	351,805	7,813,028	3,910,416	4,507,948	6,089,253	14,507,617
15	372,960	854,825	5,317,877	6,545,661	3,674,871	4,188,781	39,017	7,902,669	4,047,831	5,043,606	5,356,893	14,448,330
16	396,095	777,763	5,267,447	6,441,305	4,007,571	3,971,559	0	7,979,130	4,403,666	4,749,322	5,267,447	14,420,434
17	400,197	496,709	5,712,410	6,609,316	4,290,935	3,752,588	0	8,043,523	4,691,132	4,249,298	5,712,410	14,652,839
18	384,086	492,887	5,768,900	6,645,873	4,533,153	3,561,184	0	8,094,336	4,917,239	4,054,070	5,768,900	14,740,209
19	393,956	516,639	5,837,351	6,747,946	4,743,727	3,386,593	0	8,130,320	5,137,682	3,903,232	5,837,351	14,878,266
20	427,120	493,832	5,731,239	6,652,190	4,978,331	3,176,326	0	8,154,657	5,405,451	3,670,157	5,731,239	14,806,847
21	434,768	471,884	5,616,353	6,523,005	5,218,982	2,954,203	0	8,173,186	5,653,751	3,426,088	5,616,353	14,696,191
22	430,329	473,211	5,729,224	6,632,764	5,519,358	2,668,745	0	8,188,104	5,949,687	3,141,956	5,729,224	14,820,867
23	425,926	510,945	5,687,678	6,624,549	6,337,021	1,863,209	0	8,200,230	6,762,946	2,374,154	5,687,678	14,824,778
24	462,223	495,923	5,674,452	6,632,599	7,219,262	990,626	0	8,209,888	7,681,485	1,486,549	5,674,452	14,842,486
25	566,615	401,565	5,651,261	6,619,441	7,799,474	417,364	0	8,216,839	8,366,090	818,929	5,651,261	14,836,280

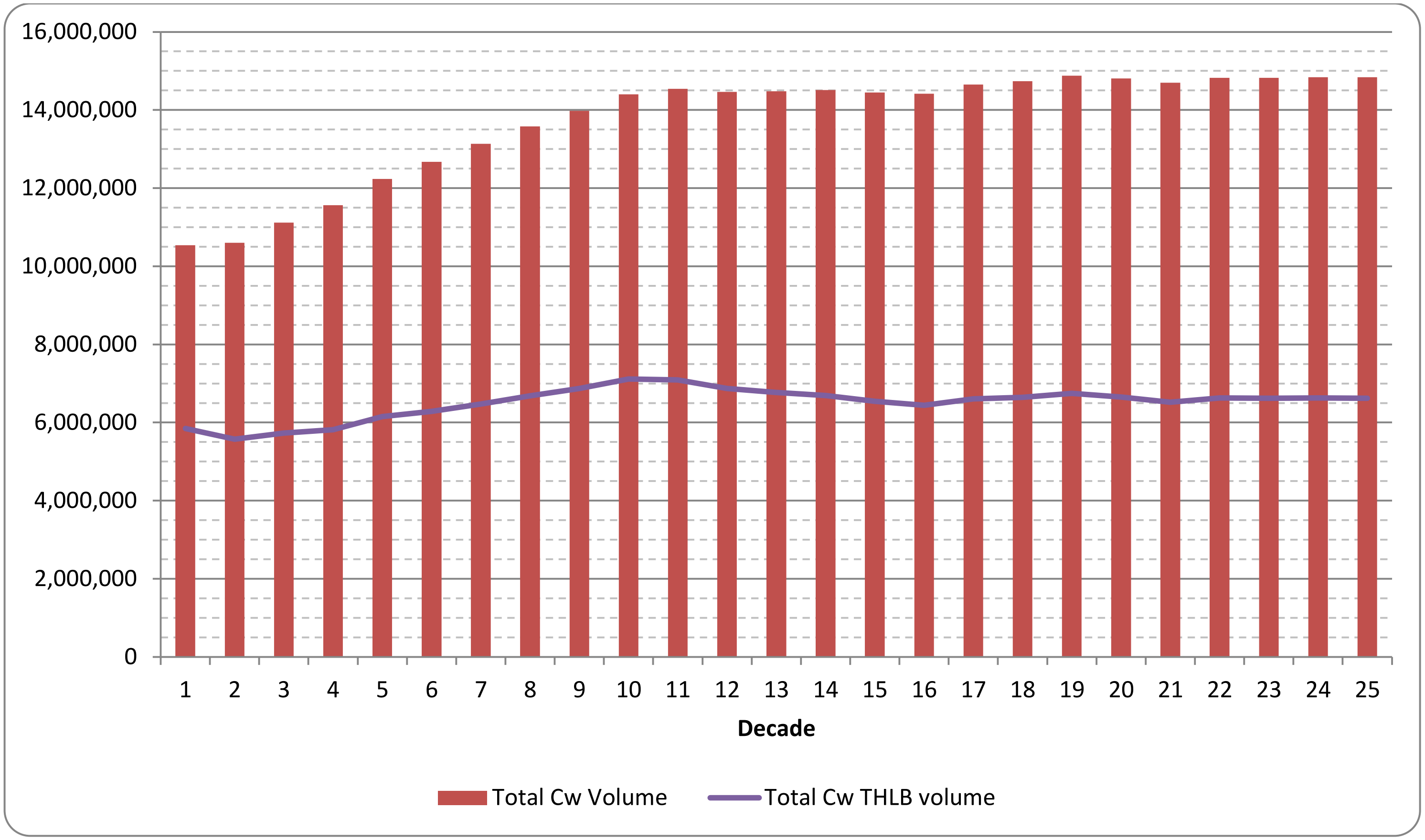

Figure 42 – TFL 39 Base Case cedar volume (m^3) estimates over time

Across the entire TFL, the amount cedar is forecast to increase by over 40%, mainly due to growth within the non-contributing landbase. Cedar within the THLB also increases slightly, with an overall shift towards younger ages.

3.0 Alternate Harvest Flows

This section examines two alternate flow scenarios. Results are presented for TFL 39 as a whole. Details by supply block can be found in Appendix B.

3.1 Maintain current AAC[2]

Table 26 and Figure 43 represent an attempt to maintain the current AAC for the first 10 years. It was impossible to maintain the current AAC contribution of 125,000 m^3/year within Blocks 3 and 5. The highest feasible harvest level was 115,000 m^3/year so the "current" AAC indicated is 10,000 m^3/year less than the actual AAC. The results indicate that, compared to the Base Case, an additional 3.848 million m^3 (12.9%) could be harvested over the first 20 years with a total of approximately 5 million m^3 (3.4%) less being harvested over the following 100 years. Overall, 1.68 million m^3 less is harvested.

Table 26 - Harvest levels maintaining current AAC

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Maintain current AAC	Difference
1	2012	2021	1,537,900	1,840,500	+ 302,600
2	2022	2031	1,451,500	1,533,700	+ 82,200
3 - 4	2032	2051	1,379,700	1,362,700	- 17,000
5	2052	2061	1,399,400	1,362,700	- 36,700
6	2062	2071	1,470,000	1,362,700	- 107,300
7	2072	2081	1,520,000	1,393,200	- 126,800
8	2082	2091	1,551,300	1,448,100	- 103,200
9	2092	2101	1,551,300	1,503,100	- 48,200
10	2102	2111	1,551,300	1,524,200	- 27,100
11	2112	2121	1,563,900	1,551,400	- 12,500
12	2122	2131	1,563,900	1,556,400	- 7,500
13 - 25	2132	2261	1,563,900	1,560,100	- 3,800

[2] Due to administrative processes within the *Forest Act* (prior to enactment of the *Allowable Annual Cut Administration Regulation*) and the timing of certain events, the current (April 2014) official AAC for TFL 39 is 1,885,980 m^3 as it still includes 21,000 m^3 within Block 7, 10,000 m^3 for the Tri-Port CFA and the 4,478 m^3 for the woodlots in Block 2 even though these areas have been deleted from the TFL. The current AAC figure presented here ignores this administrative anomaly.

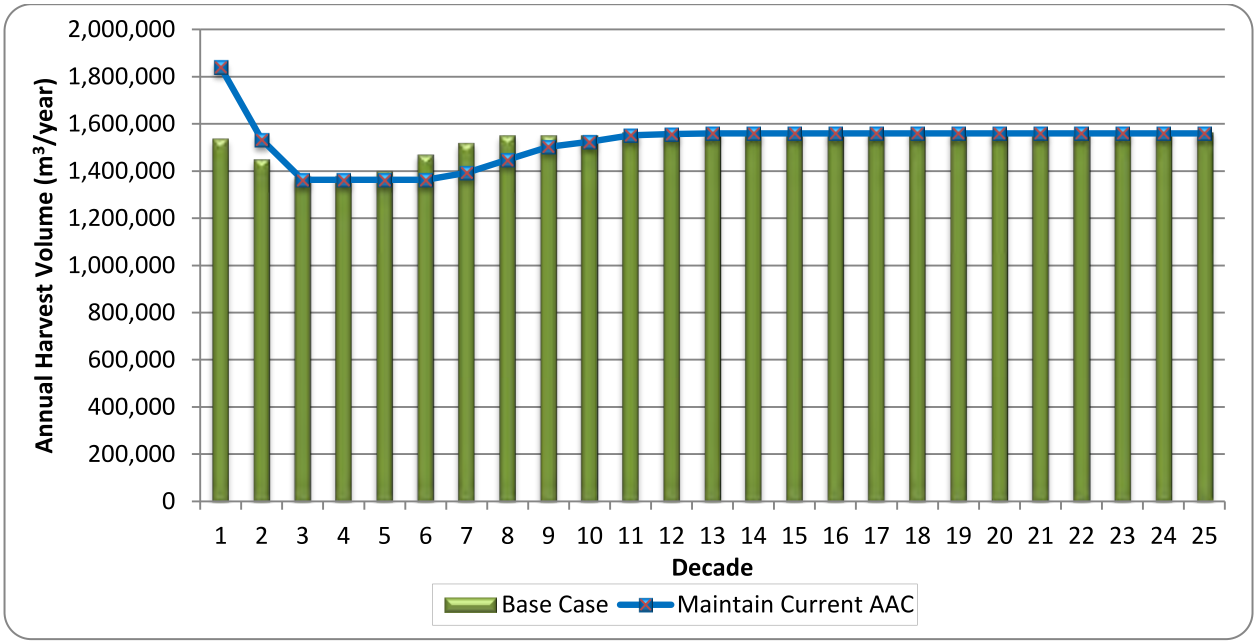

Figure 43 – Harvest levels maintaining current AAC

This alternate schedule does not recognize the possible increased harvest in Block 1 and requires declines of 20% in Block 2 in Decade 2 and 3 and more than 80% in the second decade in Blocks 3 and 5 (see Appendix B). Since the non-conventional volume constraints are still applied, this schedule forces the conventionally-operable inventory to be harvested at younger ages and makes mid and long-term timber supply more sensitive to minimum harvest criteria assumptions.

3.2 Non-declining even flow

Table 27 and Figure 44 show the impact of immediately dropping to a non-declining even flow (NDEF) harvest level. The initial harvest level is approximately 2% lower than the Base Case while the mid-term timber supply "dip" is eliminated. The LTHL is 55,600 m^3/year (3.6%) lower. Over the entire 250 years approximately 5.43 million m^3 (1.4%) less timber is harvested.

Table 27 – Harvest levels with non-declining even flow

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	NDEF	Difference
1	2012	2021	1,537,900	1,508,300	- 29,600
2	2022	2031	1,451,500	1,508,300	+ 56,800
3 - 4	2032	2051	1,379,700	1,508,300	+ 128,600
5	2052	2061	1,399,400	1,508,300	+ 108,900
6	2062	2071	1,470,000	1,508,300	+ 38,300
7	2072	2081	1,520,000	1,508,300	- 11,700
8 - 10	2082	2111	1,551,300	1,508,300	- 43,000
11 - 25	2112	2261	1,563,900	1,508,300	- 55,600

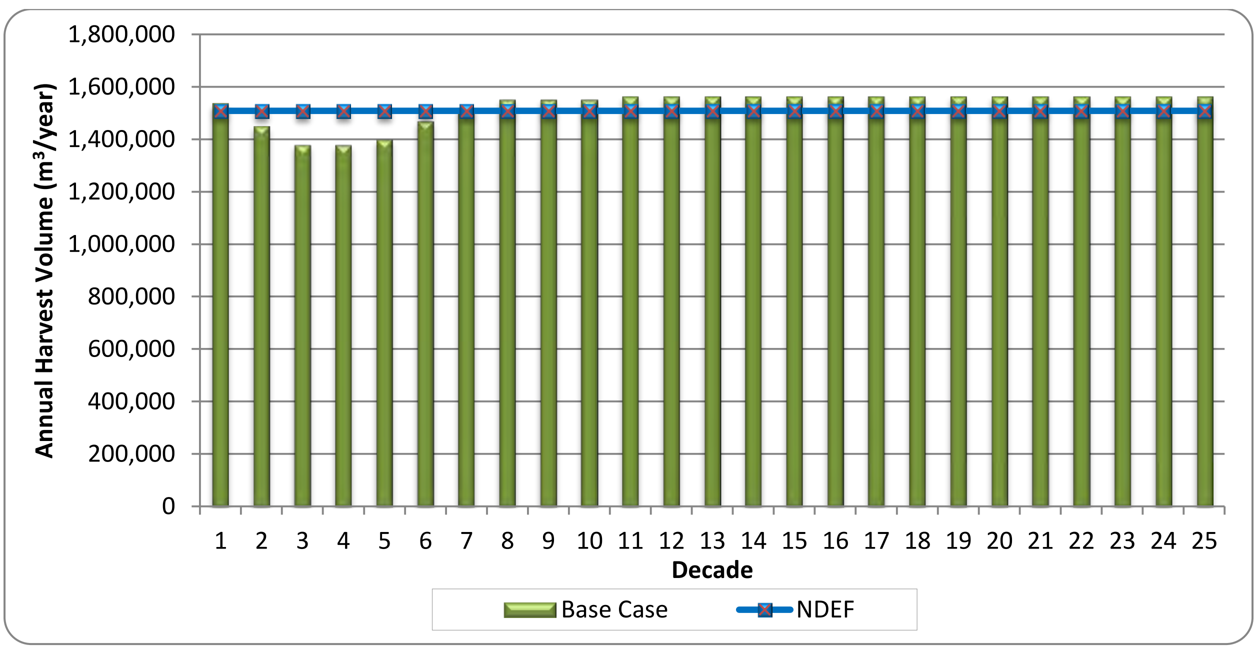

Figure 44 – Harvest levels with non-declining even flow

Since the Base Case for Block 1 is NDEF, this schedule is the same. Requesting a NDEF schedule eliminates the mid-term dip in Block 2 at the expense of short and long-term timber supply. A NDEF schedule in Block 4 increases short-term harvest while reducing mid and long-term harvest levels. For Blocks 3 and 5, a NDEF schedule achieves the same short-term harvest level but a reduced long-term harvest level due to the long-term growing stock constraint. For further details see Appendix B2.

4.0 Sensitivity Analyses

Sensitivity analysis provides a measure of the upper and lower bounds of the Base Case harvest forecast, reflecting the uncertainty of assumptions made in the Base Case. By developing and testing a number of sensitivity issues, it is possible to determine which variables most affect results. This in turn facilitates management decisions that must be made in the face of uncertainty. As Woodstock was used as an optimization tool to generate the Base Case, it is expected that the results will be sensitive to any changes to the inputs.

To allow meaningful comparison of sensitivity analyses, they are performed by varying (from the Base Case) only the assumption being evaluated. In general, sensitivities were run (1) with the same flow constraints as used in the Base Case and, (2) attempting to maintain the same initial harvest as the Base Case.

Sensitivity issues are summarized in Table 28. The timber supply impacts are illustrated in Sections 4.1 through 4.21.

Table 28 – Current Management Sensitivity Analyses

Issue	Sensitivity tested summary	Section
Landbase available for harvesting	Reduce THLB by 5%	4.1
Growth and Yield	Mature volumes increased by 10%	4.2
	Mature volumes decreased by 10%	4.3
	Immature volumes increased by 10%	4.4
	Immature volumes decreased by 10%	4.5
	Use SIBEC Site Index estimates	4.6
	Increase OAF2 by 10% for unmanaged immature yields	4.7
Forest management / Silviculture	No future genetic gain yield improvements	4.8
	Blocks 3 and 5 managed separately	4.16
Operability	Increase non-conventional harvest	4.9
	Remove non-conventional harvest constraint	4.10
	Exclude non-conventional landbase	4.11
Visual Quality	Reduce the percent disturbed within each VQO polygon	4.12
Biodiversity	Remove Western Forest Strategy impacts (area and yield impacts)	4.13
Minimum harvest criteria	Increase minimum harvest DBH criteria by 2 cm	4.14
	Decrease minimum harvest DBH criteria by 2 cm	4.15

Issue	Sensitivity tested summary	Section
Ecosystem Based Management	Meet landscape-level biodiversity requirements aspatially	4.17
	Apply risk managed landscape-level biodiversity targets	4.18
	Apply 50% RONV targets in Block 5	4.19
	Excludes SCCO objectives	4.20
Summary	Summary of sensitivity impacts	4.21

4.1 Reduce THLB by 5%

Several of the landbase netdowns used to derive the THLB (see Section 6 of the IP) are estimates and therefore subject to uncertainty. This sensitivity tests the impact of reducing the THLB. Originally this sensitivity was proposed to be conducted by excluding unstable terrain ("Class V" and "equivalent" classifications); however due to the netdowns applied there is very little unstable terrain in the Base Case THLB (see Table 29).

Table 29 – Unstable land within TFL 39

Landbase	Total area (ha)	Productive Forest Area (ha)	Operable Area (ha)	THLB Area (ha)	% of Total THLB (ha)	THLB Volume (m^3)	% of Total THLB (m^3)
Block 1	9,683	3,221	2,421	145	0.3%	79,120	0.4%
Block 2	11,366	5,467	3,992	304	0.3%	162,920	0.5%
Block 3	72	67	63	5	0.2%	2,370	0.3%
Block 4	2,021	1,450	1,341	145	0.6%	72,460	0.9%
Block 5	5,615	1,747	1,147	27	0.8%	12,320	1.4%
TFL 39 Total	28,757	11,952	8,964	626	0.4%	329,190	0.5%

Due to the small area involved, excluding unstable terrain would have a negligible impact on harvest levels. There is no netdown for which the degree of uncertainty is greater than the others so it was decided to uniformly decrease the THLB by reducing the harvestable area within each polygon in the data set by five percent.

Table 30 and Figure 45 indicate the results of applying the same assumptions as used in the Base Case.

Table 30 – Harvest levels with THLB reduced by 5%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Reduced THLB	Difference	Alternate Reduced THLB	Difference
1	2012	2021	1,537,900	1,468,400	- 69,500	1,537,900	0
2	2022	2031	1,451,500	1,386,000	- 65,500	1,419,500	- 32,000
3 - 4	2032	2051	1,379,700	1,311,700	- 68,000	1,341,700	- 38,000
5	2052	2061	1,399,400	1,328,500	- 70,900	1,358,600	- 40,800
6	2062	2071	1,470,000	1,399,000	- 71,000	1,379,000	- 91,000
7	2072	2081	1,520,000	1,449,000	- 71,000	1,379,000	- 141,000
8	2082	2091	1,551,300	1,478,100	- 73,200	1,433,100	- 118,200
9 - 10	2092	2111	1,551,300	1,478,100	- 73,200	1,472,900	- 78,400
11 - 25	2112	2261	1,563,900	1,490,100	- 73,800	1,485,900	- 78,000

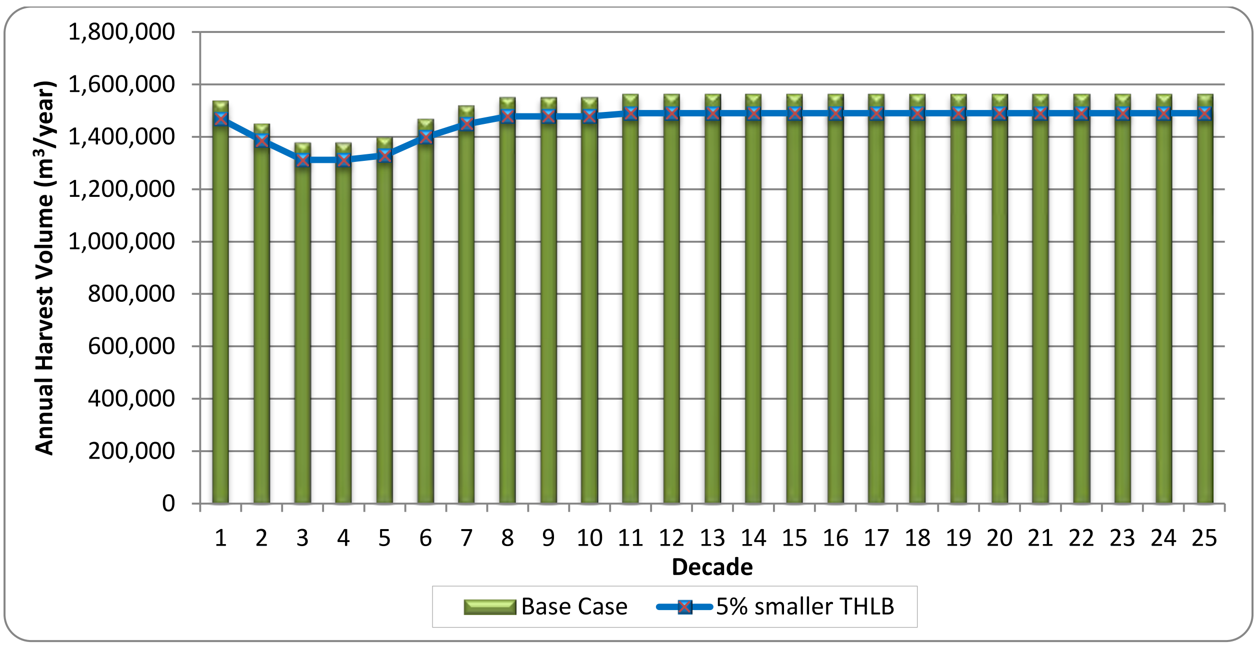

Figure 45 – Harvest levels with THLB reduced by 5%

The initial harvest level is 69,500 m^3/year (4.5%) less than the Base Case. The timber supply impacts are less than the THLB impact partially due to the non-conventional volume constraints in the Base Case mitigating the impact of reducing the non-conventional THLB. The LTHL is 73,800 m^3/year (4.7%) lower and total harvest over the 250 years is 18.1 million m^3 (4.7%) less.

Alternatively, the initial harvest level of the Base Case can be achieved by reducing mid-term timber supply (refer to Figure 46). Compared to the schedule above, this alternate schedule achieves higher harvest levels for the first 50 years, lower harvest during the following 30 years and a LTHL 4,200 m^3/year (0.3%) lower. Overall, 153,000 m^3 less is harvested.

See Appendix B3 for details by supply block.

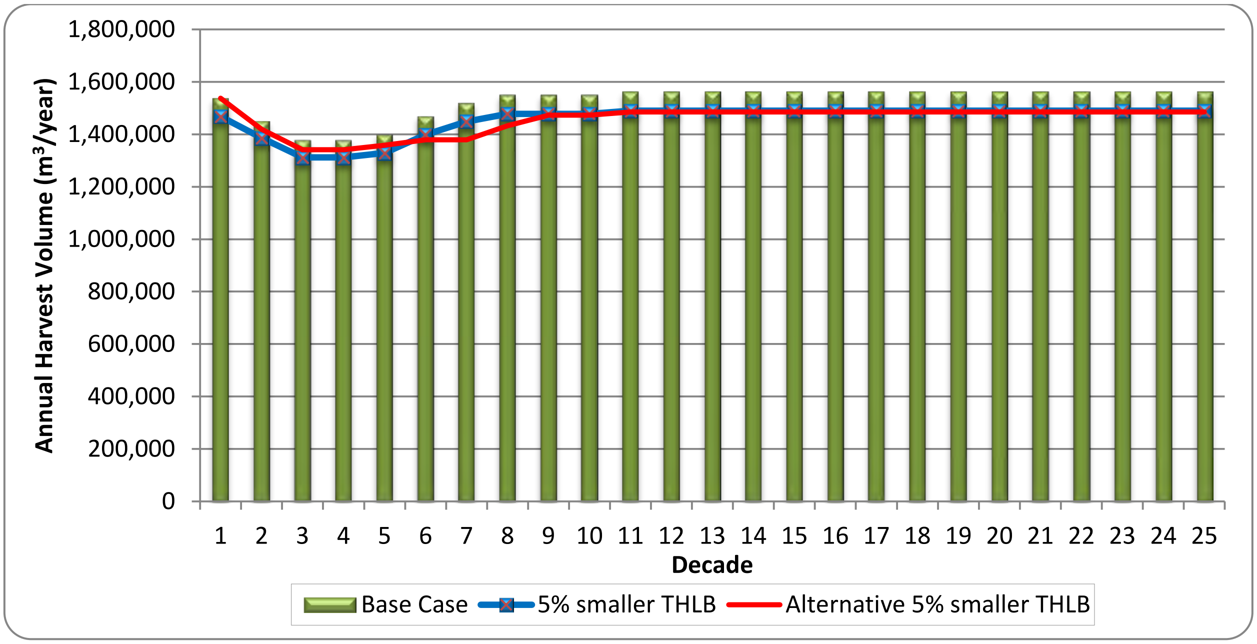

Figure 46 – Alternate harvest levels with THLB reduced by 5%

Most THLB netdowns are legal reserves (e.g. UWRs, OGMAs) or have a high degree of spatial confidence (e.g. non-forest, inoperable). Netdowns with some degree of uncertainty include riparian management, terrain stability and stand-level retention. The assumptions used for these netdowns are based on analyses of recently harvested cutblocks or have been used for past timber supply analyses and no better information is available.

4.2 Mature volumes increased by 10%

The sensitivity of timber supply to volume estimates of mature stands (older than 140 years in 2012) was tested by increasing (this Section) and decreasing (Section 4.3) these volumes by 10%. The volumes in these stands were estimated using area-weighted inventory averages with 1990's audit results used to adjust some stands (see Section 5.1 of the Information Package for details).

Mature stands provide the majority of the total volume in the first decade of the Base Case schedule (see Figure 3); however the contribution varies significantly by individual supply block due to the differing THLB age class distributions (refer to Section 2.1) and targets incorporated for the amount of second growth harvested in the initial period. This sensitivity adds 2.72 million m^3 (4.2%) to the current THLB inventory. These results (Table 31 and Figure 47) indicate the harvest levels achieved when allowing the initial harvest level to increase.

Table 31 – Harvest levels with increased mature stands yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Increased Mature Volumes	Difference	Alternate Increased Mature Volumes	Difference
1	2012	2021	1,537,900	1,575,600	+ 37,700	1,545,200	+ 7,300
2	2022	2031	1,451,500	1,486,100	+ 34,600	1,470,200	+ 18,700
3 - 4	2032	2051	1,379,700	1,405,600	+ 25,900	1,414,400	+ 34,700
5	2052	2061	1,399,400	1,425,900	+ 26,500	1,434,700	+ 35,300
6	2062	2071	1,470,000	1,491,100	+ 21,100	1,499,800	+ 29,800
7	2072	2081	1,520,000	1,541,100	+ 21,100	1,549,800	+ 29,800
8 - 10	2082	2111	1,551,300	1,552,500	+ 1,200	1,552,600	+ 1,300
11 - 25	2112	2261	1,563,900	1,563,900	0	1,564,000	+ 100

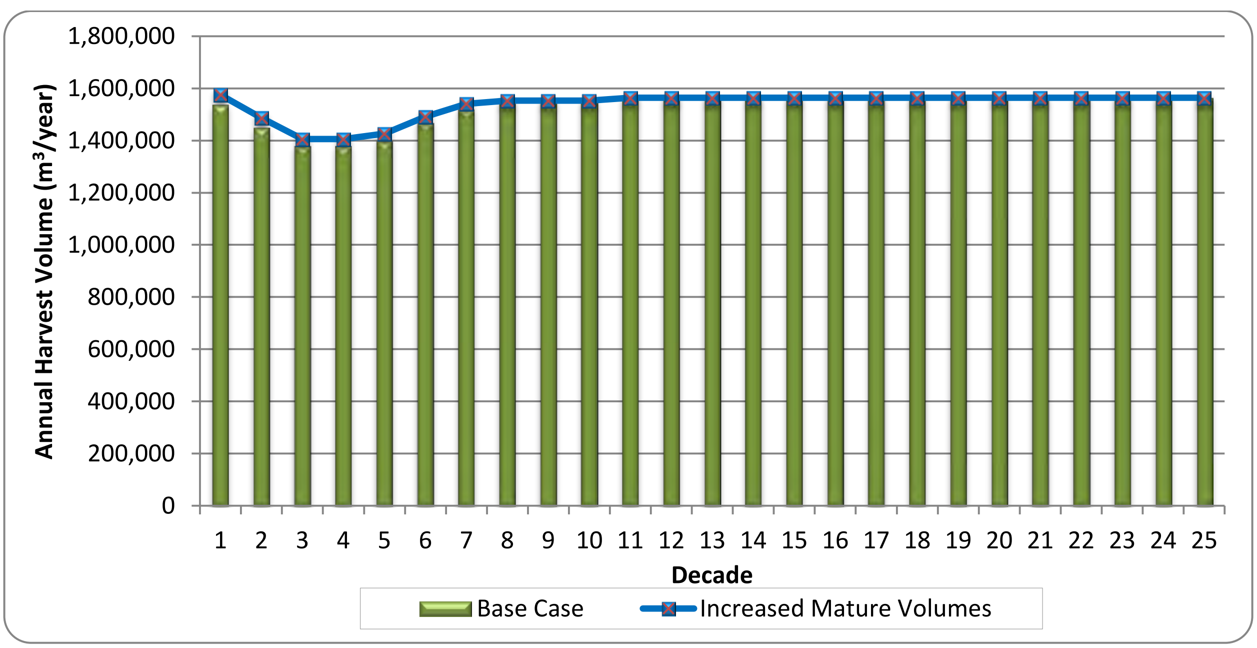

Figure 47 – Harvest levels with increased mature stands yields

As expected, with the increase in currently operable inventory short and mid-term harvest levels can be increased. The harvest level in the first 20 years is 2.4% greater and averages 1.6% greater over the following 50 years. The LTHL is unaffected. Total harvest over the entire 250 years is 1.96 million m^3 (0.5%) more than the Base Case.

Short-term harvest level is less than 10% greater due to the second growth requirements and non-conventional constraints applied in the Base Case. These restrictions reduce the timber supply contribution from mature stands and therefore the gains achieved by increasing the mature yields.

Alternatively, the increased mature volume could be used to reduce the timber supply “dip” in Block 2 by maintaining the initial harvest level of the Base Case and using the additional volume in the mid-term (see red line in Figure 48). Also, this approach allows the second growths stands to age a little more and achieve higher yields, thereby further increasing mid-term timber supply.

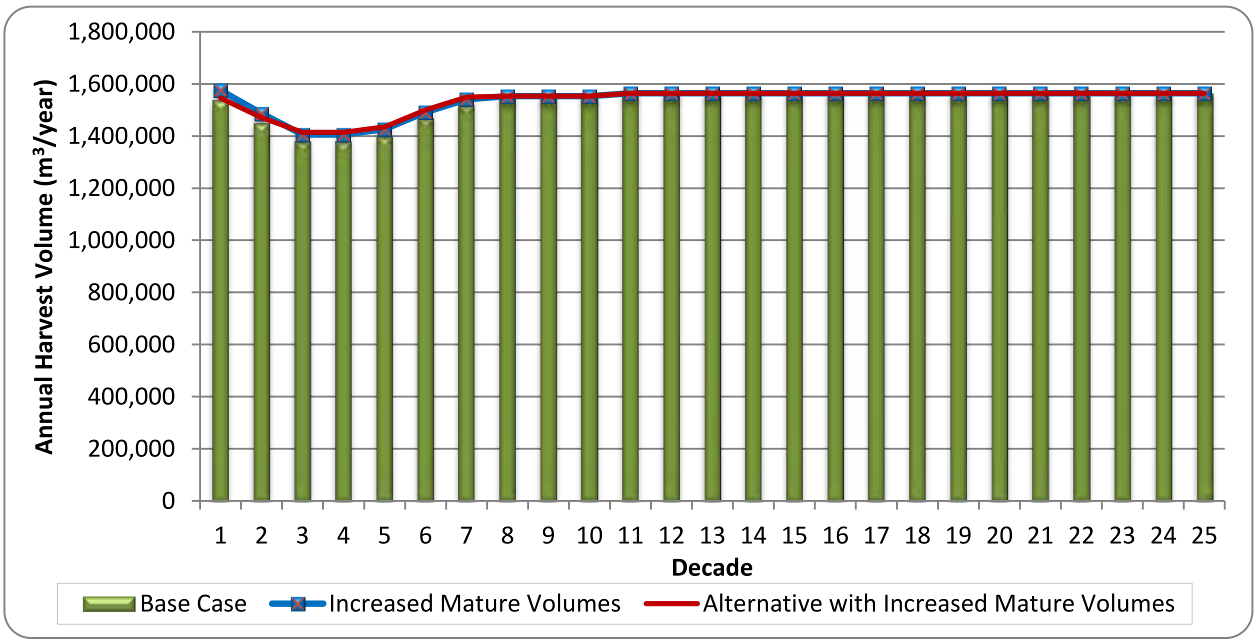

Figure 48 – Alternate harvest levels with increased mature stands yields

This alternate schedule reduces the initial harvest level (relative to the schedule shown in Figure 47) by 30,400 m^3/year (1.9%) but increases the harvest level in Decades 3 – 7 by 8,800 m^3/year (0.6%). The difference in LTHL and total volume harvested over the 250 years between these two possible schedules are 100 m^3/year and 9,000 m^3 respectively.

Details by individual supply blocks are shown in Appendix B4.

4.3 Mature volumes decreased by 10%

The decreased yields result in approximately 2.72 million m^3 (4.2%) less inventory on the THLB today when compared to the Base Case. Table 32 and Figure 49 indicate the results of applying the same modelling rules as used in the Base Case

Table 32 – Harvest levels with decreased mature stands yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Decreased Mature Volumes	Difference	Alternate Decreased Mature Volumes	Difference
1	2012	2021	1,537,900	1,481,300	- 56,600	1,537,900	0
2	2022	2031	1,451,500	1,399,900	- 51,600	1,449,900	- 1,600
3 - 4	2032	2051	1,379,700	1,362,200	- 17,500	1,372,100	- 7,600
5	2052	2061	1,399,400	1,381,300	- 18,100	1,374,100	- 25,300
6	2062	2071	1,470,000	1,452,300	- 17,700	1,412,200	- 57,800
7	2072	2081	1,520,000	1,507,400	- 12,600	1,480,200	- 39,800
8	2082	2091	1,551,300	1,549,600	- 1,700	1,535,000	- 16,300
9 - 10	2092	2111	1,551,300	1,549,600	- 1,700	1,547,100	- 4,200
11 - 25	2112	2261	1,563,900	1,563,100	- 800	1,560,200	- 3,700

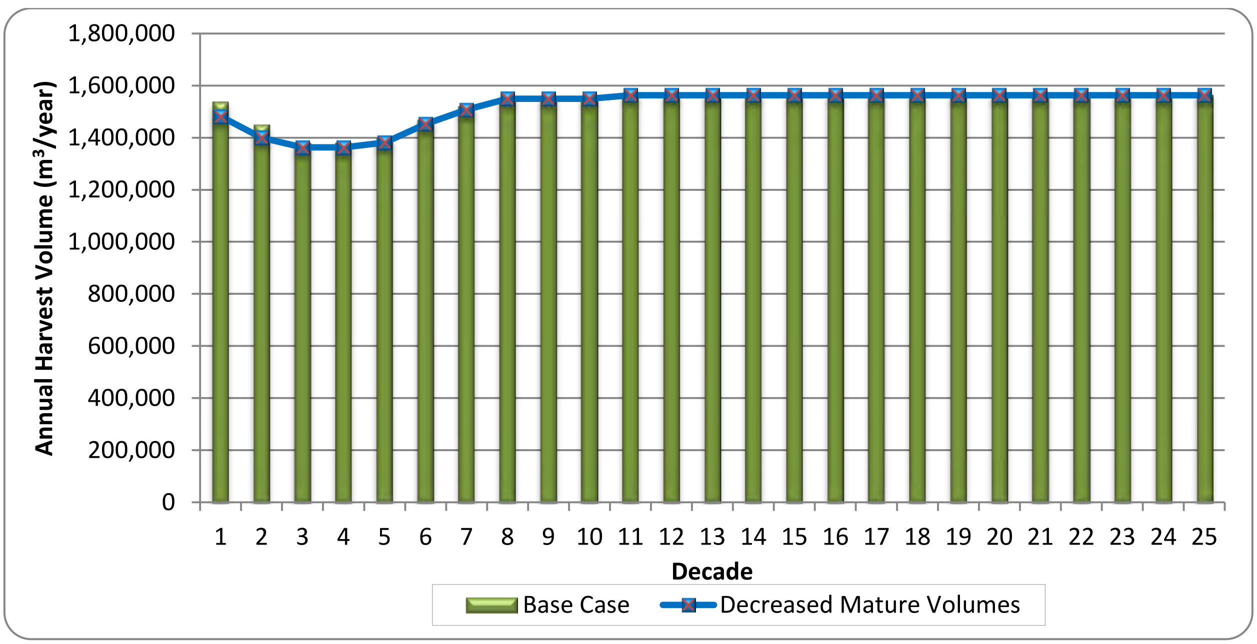

Figure 49 – Harvest levels with decreased mature stands yields

The reduced inventory results in an initial harvest level decrease of 56,600 m^3/year (3.7%). The LTHL is 800 m^3/year (0.1%) less than the Base Case while roughly 2.09 million m^3 (0.5%) less timber is harvested over the 250 years.

As with the increased mature volumes discussed in Section 4.2 , short-term harvest level is reduced by less than 10% due to the second growth requirements and non-conventional constraints applied in the Base Case. These restrictions reduce the timber supply contribution from mature stands and therefore the loss realized by decreasing the mature yields.

Alternatively, the initial harvest level of the Base Case can be achieved with an impact to mid-term timber supply (see Figure 50). This alternate schedule achieves higher harvest levels during the first 40 years but lower levels for the remainder of the schedule. The greatest reduction in timber supply occurs during Decades 6 - 8 due to reduced inventory as a result of higher short-term harvest. This schedule results in a LTHL approximately 3,700 m^3/year (0.2%) lower than the Base Case and about 2.21 million m^3 (0.6%) less timber harvested over the 250 years.

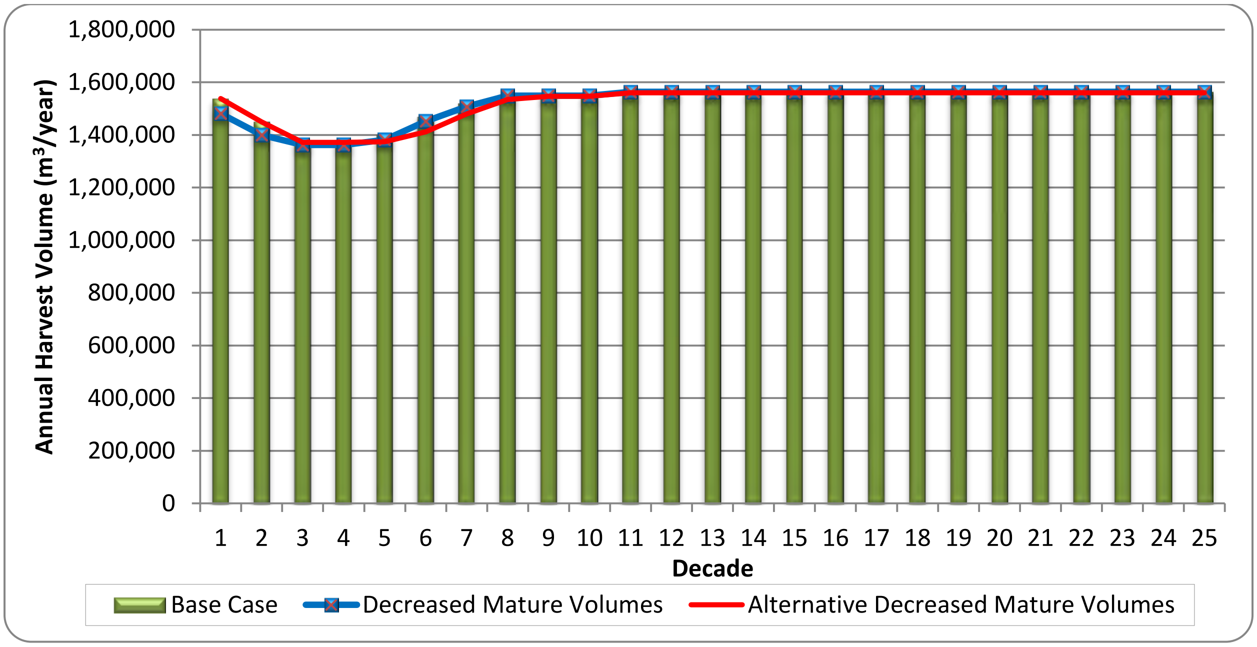

Figure 50 – Alternate harvest levels with decreased mature stands yields

Individual supply block schedules are shown in Appendix B5.

Volume estimates for mature stands are based on inventory cruises from the 1960's that have been updated and upgraded with new cruise data over time. The inventory was audited in the 1990's with no statistically significant difference found for the cruised portion of the inventory. For the un-cruised portion of the inventory (photo-typed to most similar cruised stand-type), statistically significant differences were found and the volumes used in this analysis have been adjusted accordingly.

4.4 Immature volumes increased by 10%

The sensitivity of timber supply to immature stands (140 years old and younger in 2012) volume estimates was tested by increasing (this section) and decreasing (Section 4.5) these volumes by 10%. Volumes in these younger stands were estimated from attributes and assumptions detailed in Section 8 of the IP and the MFLNRO's *Table Interpolation Program for Stand Yields* (TIPSY) version 4.2.

Table 33 and Figure 51 indicate that with increased immature yields timber supply is significantly greater, including in the short-term. This is logical as immature stands provide the majority of volume in Block 1 throughout the schedule and beginning in the second or third decade in the other blocks (refer to Section 2.1 for timber supply contribution details by supply block). Increasing immature yields by 10% adds 3.83 million m^3 (5.8%) to THLB growing stock, of which 1.65 million m^3 is immediately available.

This run results in approximately 35.06 million m^3 (9.2%) more harvest than the Base Case over the 250 year planning horizon. The long term harvest level is 9.6% greater than in the Base Case, slightly less than 10% greater due to the annual non-conventional harvest restrictions reducing the impact of the higher volumes within the non-conventional portion of the THLB.

Table 33 – Harvest levels with increased immature stands yields

			Annual Harvest Volume (m^3)				
Period (Decade #)	Start Year	End Year	Base Case	Increased Immature Volumes	Difference	Alternate Increased Immature Volumes	Difference
1	2012	2021	1,537,900	1,618,600	+ 80,700	1,605,800	+ 67,900
2	2022	2031	1,451,500	1,529,600	+ 78,100	1,526,300	+ 74,800
3 - 4	2032	2051	1,379,700	1,505,100	+ 125,400	1,526,300	+ 146,600
5	2052	2061	1,399,400	1,526,100	+ 126,700	1,526,300	+ 126,900
6	2062	2071	1,470,000	1,599,200	+ 129,200	1,598,600	+ 128,600
7	2072	2081	1,520,000	1,656,500	+ 136,500	1,663,200	+ 143,200
8 - 10	2082	2111	1,551,300	1,700,600	+ 149,300	1,698,600	+ 147,300
11 - 25	2112	2261	1,563,900	1,714,300	+ 150,400	1,714,200	+ 150,300

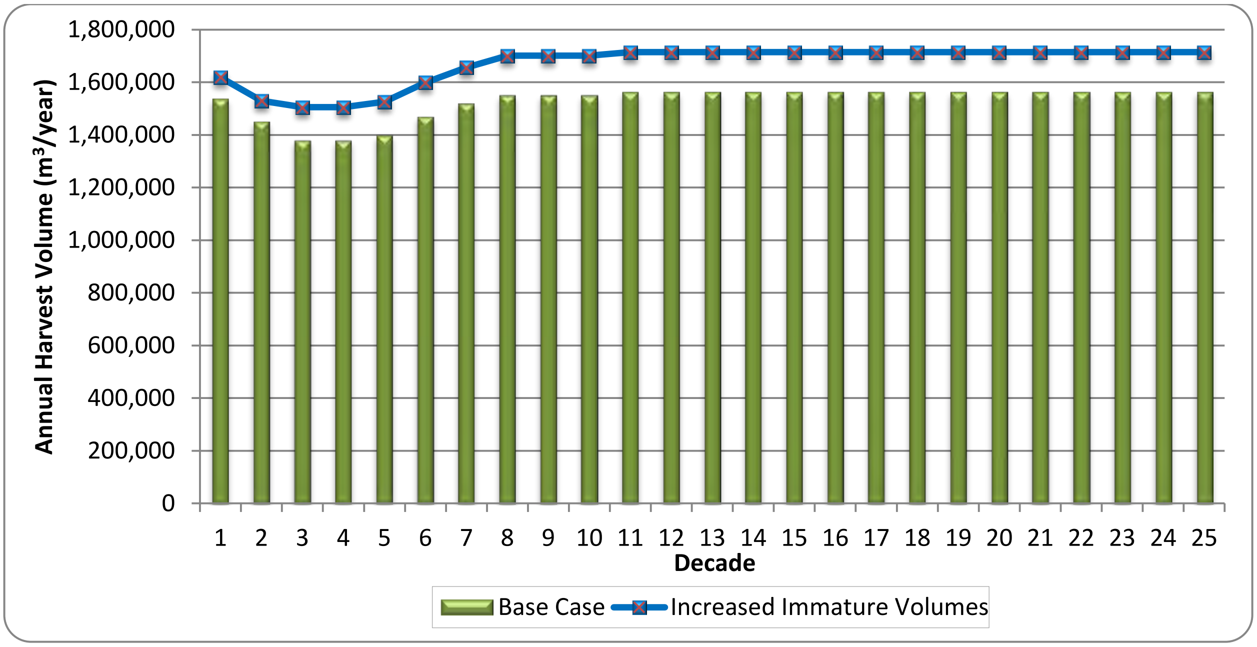

Figure 51 – Harvest levels with increased immature stands yields

Alternatively, the initial harvest level of the Base Case for Block 2 can be achieved with an increase to mid-term timber supply (see Figure 52). Relative to the schedule shown above, this alternate schedule reduces the initial harvest level by 12,800 m^3/year (0.8%) but increases harvest in Decade 3 and 4 by 21,200 m^3/ year (1.4%) and LTHL is unaffected. Overall about 0.25 million m^3 (0.6%) more timber is harvested over the 250 years.

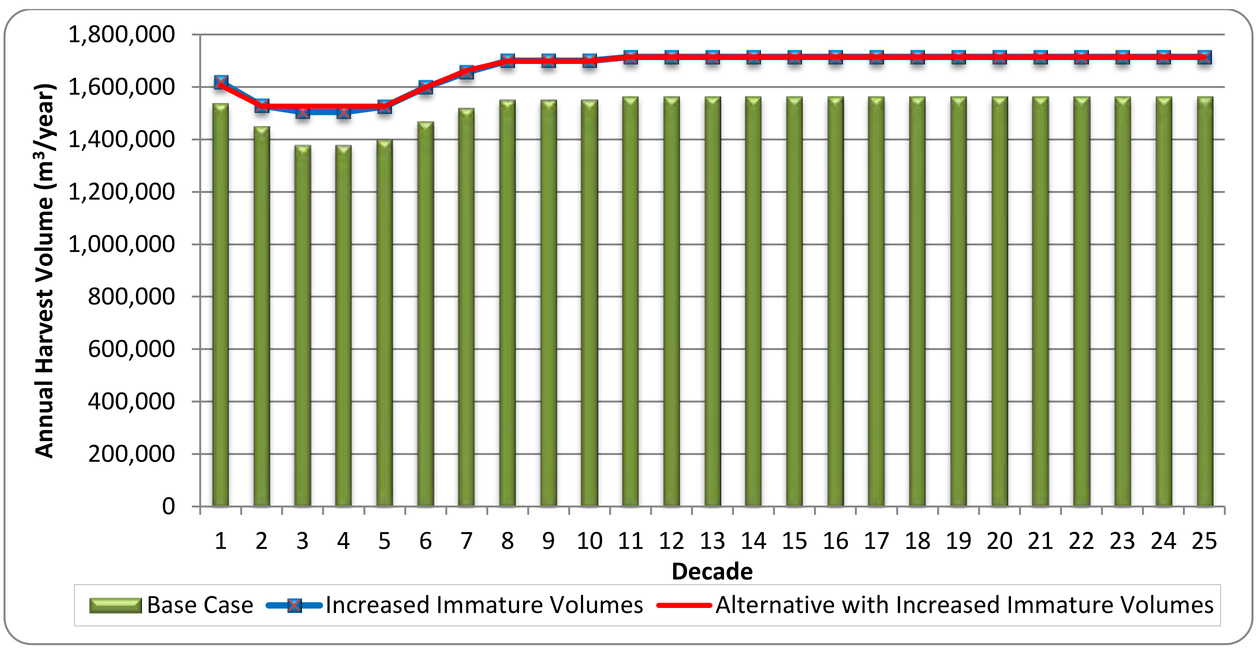

Figure 52 – Alternate harvest levels with increased immature stands yields

Details by individual supply blocks are shown in Appendix B6.

4.5 Immature volumes decreased by 10%

With immature stands yields decreased by 10%, timber supply is affected through the entire planning horizon (see Table 34 and Figure 53). Total THLB growing stock is reduced by 3.83 million m^3 and available growing stock by 1.76 million m^3 (4.7%). Initial harvest level is reduced by 112,100 m^3/year (7.3%). The timber supply impact gradually increases such that the long term harvest level is 155,800 m^3/year (10.0%) lower than the Base Case results. Over the entire 250 year planning horizon, 35.83 million m^3 (9.4 %) less is harvested in this sensitivity.

Table 34 – Harvest levels with decreased immature stands yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Decreased Immature Volumes	Difference	Alternate Decreased Immature Volumes	Difference
1	2012	2021	1,537,900	1,425,800	- 112,100	1,537,900	0
2	2022	2031	1,451,500	1,345,100	- 106,400	1,448,500	- 3,000
3 - 4	2032	2051	1,379,700	1,272,400	- 107,300	1,327,100	- 52,600
5	2052	2061	1,399,400	1,290,900	- 108,500	1,327,100	- 72,300
6	2062	2071	1,470,000	1,351,500	- 118,500	1,327,100	- 142,400
7	2072	2081	1,520,000	1,395,500	- 124,500	1,337,600	- 182,400
8 - 9	2082	2101	1,551,300	1,397,600	- 153,700	1,340,700	- 210,600
10	2102	2111	1,551,300	1,397,600	- 153,700	1,347,100	- 204,200
11 - 25	2112	2261	1,563,900	1,408,100	- 155,800	1,397,800	- 166,100

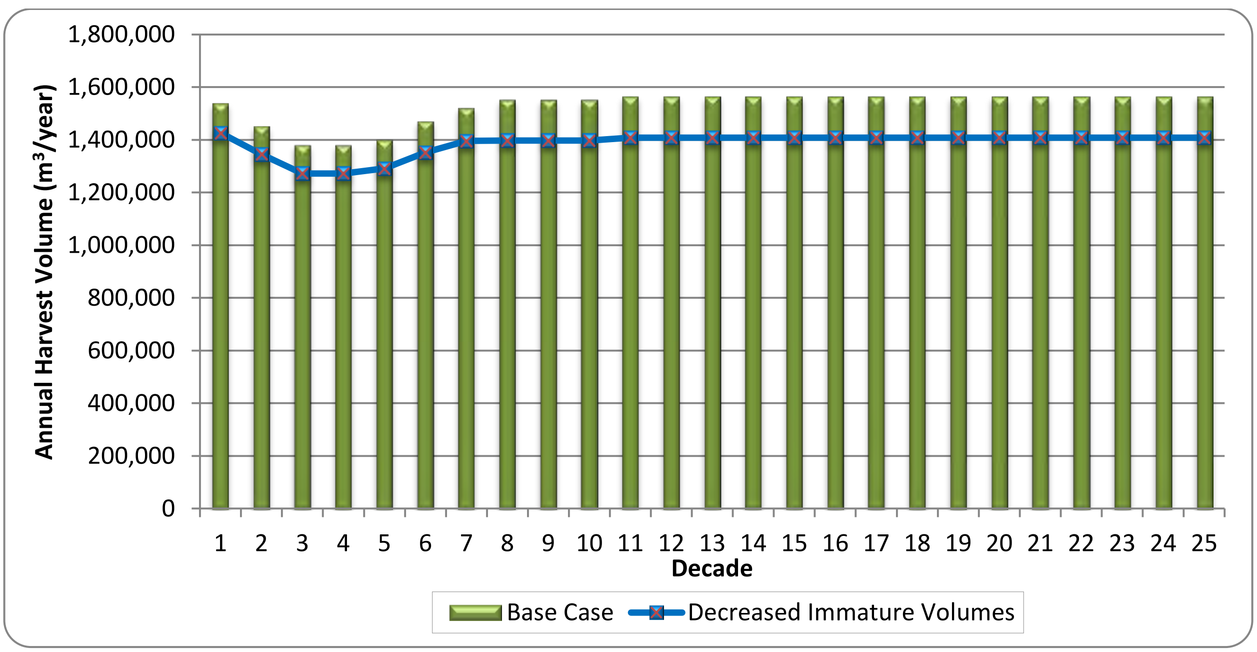

Figure 53 – Harvest levels with decreased immature stands yields

Alternatively, the initial harvest level of the Base Case can be achieved by decreasing mid-term timber supply relative to the schedule indicated in Table 16 and Figure 47. This alternate schedule (see Figure 54) increases short-term harvest by 7.8% but decreases harvest in Decade 7 – 9 by 4.1%. Long-term harvest is reduced by approximately 10,000 m^3/year (0.7%). Overall, about 0.4 million m^3 (0.1%) less timber is harvested over the 250 years.

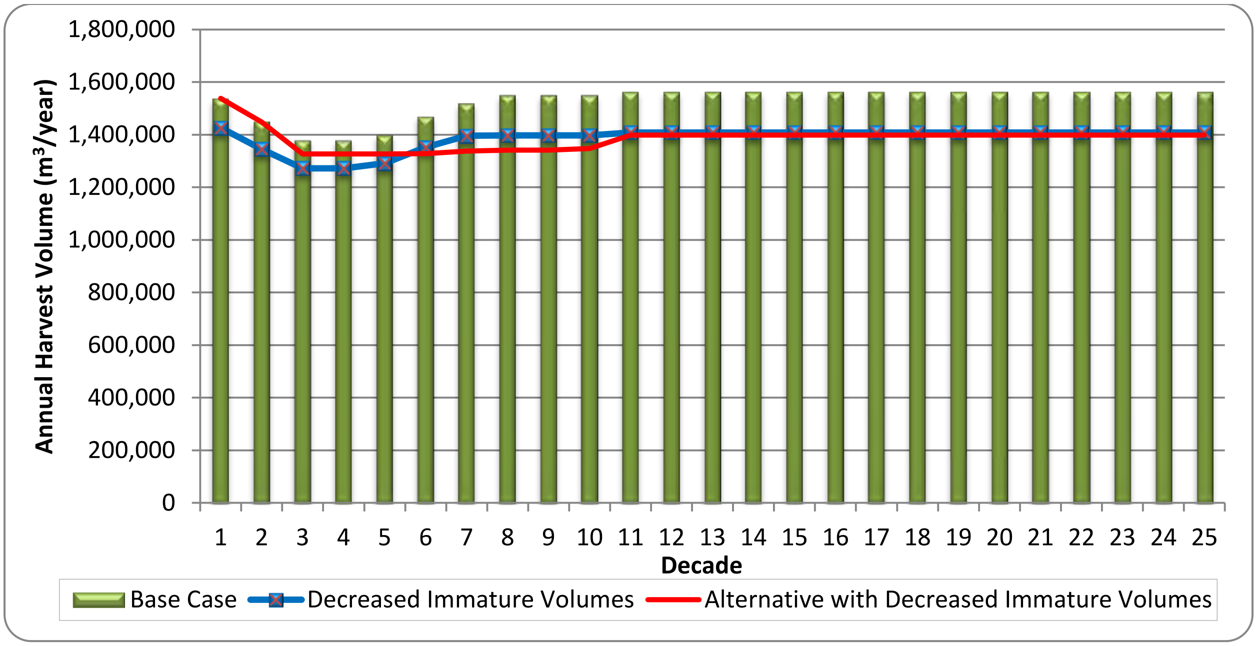

Figure 54 – Alternate harvest levels with decreased immature stands yields

Individual supply block schedules are shown in Appendix B7.

4.6 Use SIBEC Site Index estimates

The Base Case used WFP site indexes to estimate site productivity. These site index values are statistically-based estimates of average site index for the major commercial tree species in TFL 39. A frequently used approach for estimating site productivity is to use Terrestrial Ecosystem Mapping (TEM – site series mapping) and the associated SIBEC (Site Index by Biogeoclimatic Ecosystem Classification) site index estimates. Normally the use of TEM and SIBEC depends on an accuracy assessment having been done for the TEM. No such assessment has been done for the TFL 39 TEM, but this analysis was run to indicate the sensitivity of timber supply to site productivity estimates.

The SIBEC site indexes result in a 1.42 million m^3 (2.2%) increase in THLB inventory at the beginning of the analysis but an increase of 2.31 million m^3 (6.2%) in available inventory (mainly in Block 1). The greater increase in available inventory is due to more stands meeting both the minimum diameter and volume thresholds. Overall, SIBEC estimates increase immature stands yields by approximately 2-3% on average (at average harvest ages) but the impact varies significantly across the analysis units and supply blocks (see Appendix B8).

The increased yields create greater timber supply in the mid and long-term (when comparing against the Base Case); however, short-term timber supply is reduced in Blocks 2 and 3/5 such that total TFL 39 timber supply is also reduced (refer to Table 35 and Figure 55). Overall, there is 8.93 million m^3 (2.3%) more harvested. The long term harvest level is approximately 0.9% more than the Base Case level.

Table 35 – Harvest levels with yields based on SIBEC values

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	SIBEC-based Yields	Difference	Alternate SIBEC-based Yields	Difference
1	2012	2021	1,537,900	1,500,000	- 37,900	1,538,000	+ 100
2	2022	2031	1,451,500	1,433,600	- 17,900	1,447,500	- 4,000
3	2032	2041	1,379,700	1,433,600	+ 53,900	1,422,300	+ 42,600
4	2032	2051	1,379,700	1,444,500	+ 64,800	1,433,200	+ 53,500
5	2052	2061	1,399,400	1,465,300	+ 65,900	1,453,900	+ 54,500
6	2062	2071	1,470,000	1,523,600	+ 53,600	1,512,300	+ 42,300
7	2072	2081	1,520,000	1,573,600	+ 53,600	1,562,300	+ 42,300
8	2082	2091	1,551,300	1,581,300	+ 30,000	1,578,900	+ 27,600
9 - 10	2092	2111	1,551,300	1,582,700	+ 31,400	1,582,300	+ 31,300
11 - 25	2112	2261	1,563,900	1,602,100	+ 38,200	1,602,000	+ 38,100

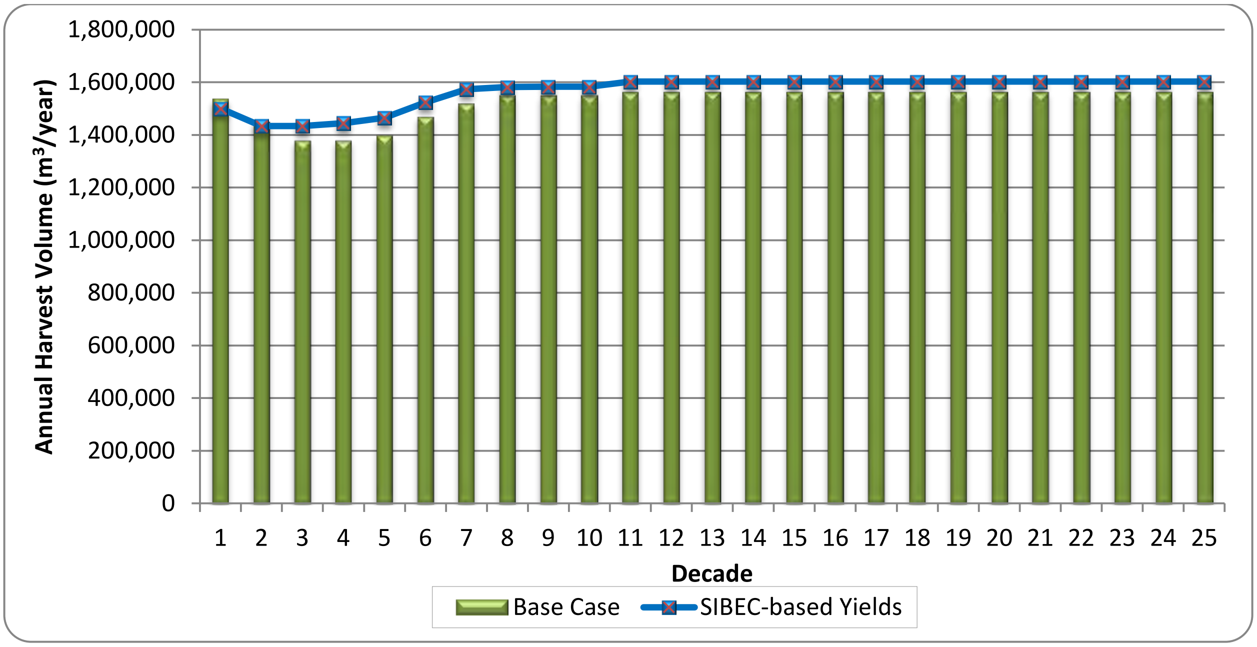

Figure 55 – Harvest levels with yields based on SIBEC values

Rather than decreasing the short-term harvest, it is feasible to maintain the initial harvest level of the Base Case by reducing the mid-term timber supply increase (see Figure 56). This alternative schedule increases the initial harvest level by 37,900 m^3/year and reduces mid-term timber supply by 11,400 m^3/year relative to the schedule shown above. The long-term harvest level is unaffected and total harvest is reduced by 88,000 m^3.

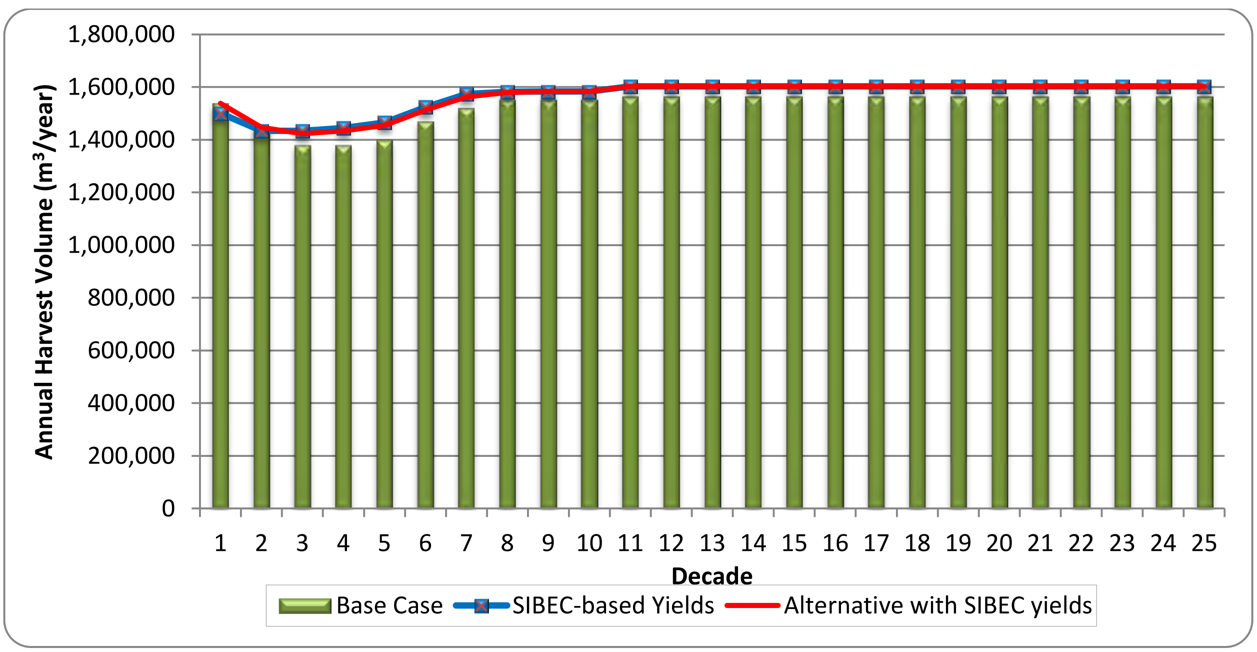

Figure 56 – Alternate harvest levels with SIBEC-based yields

Individual supply block schedules are shown in Appendix B8.

4.7 Increased OAF2 for Unmanaged Immature Stands

The Base Case includes yields for unmanaged immature stands (ages 51-140 years in 2012) are based on TIPSY yield model output calibrated using “pole size” cruise results (see Section 9.5.2 of the IP for details). The more commonly used approach is to use the VDYP yield model for unmanaged stands; however, the TFL 39 forest inventory does not have all attributes required by VDYP. A further review of the TIPSY-based yield tables for these stands indicated that some yields at older ages (greater than 80 years) were up to 10% higher than average cruise results. Also, a comparison to yield tables used in the latest TFL 6 analysis for similar analysis units, which were generated using VDYP 6.6, indicated that VDYP yields tend to be lower than TIPSY at older ages. For this sensitivity analysis, new yield tables were generated for unmanaged immature stands with OAF2 increased by 10% (i.e., generally from 5 % to 15%). This change reduces (compared to the base yield tables) yields at age 100 years by 10 percent, with reductions being 1 percent less for every 10 years younger and 1 percent greater for every 10 years older.

These changes reduce the total THLB growing stock by 1.97 million m^3 (3.0%) and available inventory by 2.17 million m^3 (5.8%). As initial timber supply in Blocks 1 and 3/5 largely depends on contribution from unmanaged immature stands, these yield changes reduce the total initial harvest level by 21,800 m^3/year (1.4%) – refer to Table 36 and Figure 57. The timber supply impact increases to 39,000 m^3/year (2.8%) in the fifth and sixth decades and then decreases to about 1 percent. The mid-term impact is greater as the contribution from these stands increases in this time frame. The long-term impact results from harvesting managed stands at younger ages and therefore reduced yields due to less mid-term timber supply from unmanaged stands. Overall, approximately 4.9 million m^3 (~1.3%) less is harvested over the 250 years.

Table 36 – Harvest levels with increased OAF2 for unmanaged immature stands

			Annual Harvest Volume (m^3)				
Period (Decade #)	Start Year	End Year	Base Case	Increased OAF2	Difference	Alternate Increased OAF2	Difference
1	2012	2021	1,537,900	1,516,100	- 21,800	1,537,900	0
2	2022	2031	1,451,500	1,429,700	- 21,800	1,425,100	- 26,400
3 - 4	2032	2051	1,379,700	1,351,900	- 27,800	1,347,300	- 32,400
5	2052	2061	1,399,400	1,360,400	- 39,000	1,355,700	- 43,700
6	2062	2071	1,470,000	1,430,900	- 39,100	1,426,300	- 43,700
7	2072	2081	1,520,000	1,502,700	- 17,300	1,502,400	- 17,600
8 - 10	2082	2111	1,551,300	1,534,400	- 16,900	1,534,600	- 16,700
11 - 25	2112	2261	1,563,900	1,547,500	- 16,400	1,547,700	- 16,200

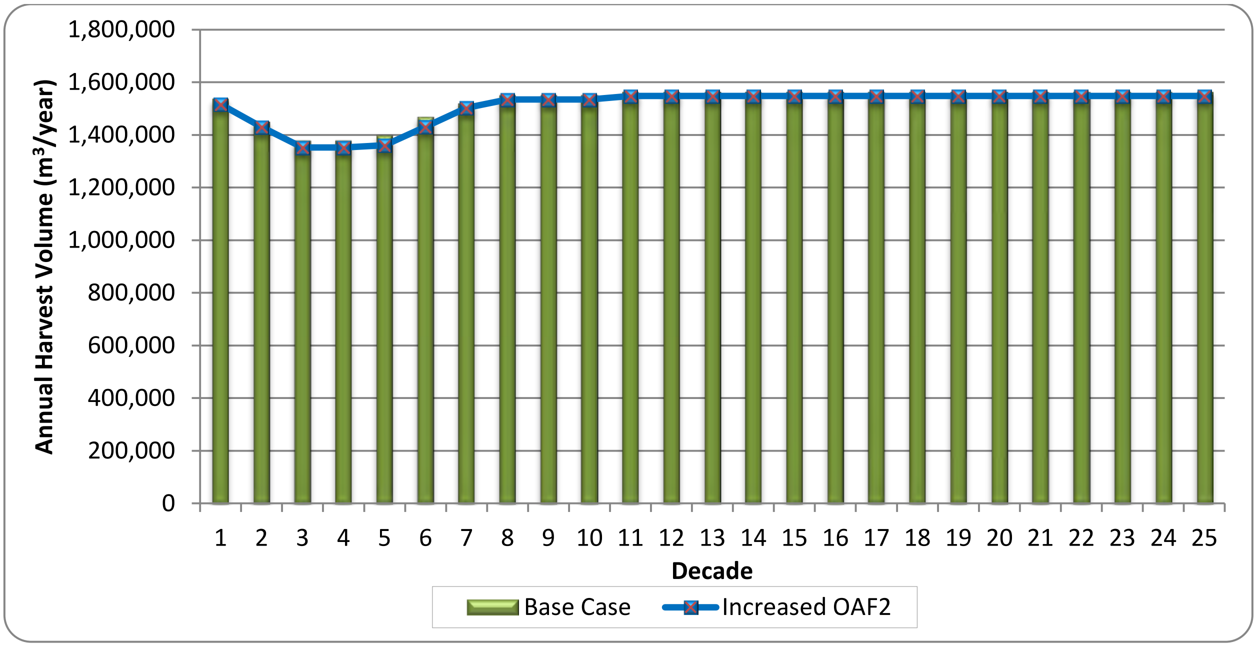

Figure 57 – Harvest levels with increased OAF2 for unmanaged immature stands

It is feasible to maintain the initial harvest level of the Base Case by reducing mid-term timber supply (see Figure 58). This alternative schedule increases the initial harvest level by 21,800 m^3/year and reduces mid-term timber supply by 4,600 m^3/year relative to the schedule shown above. The long-term harvest level is unaffected and total harvest is increased by 16,000 m^3.

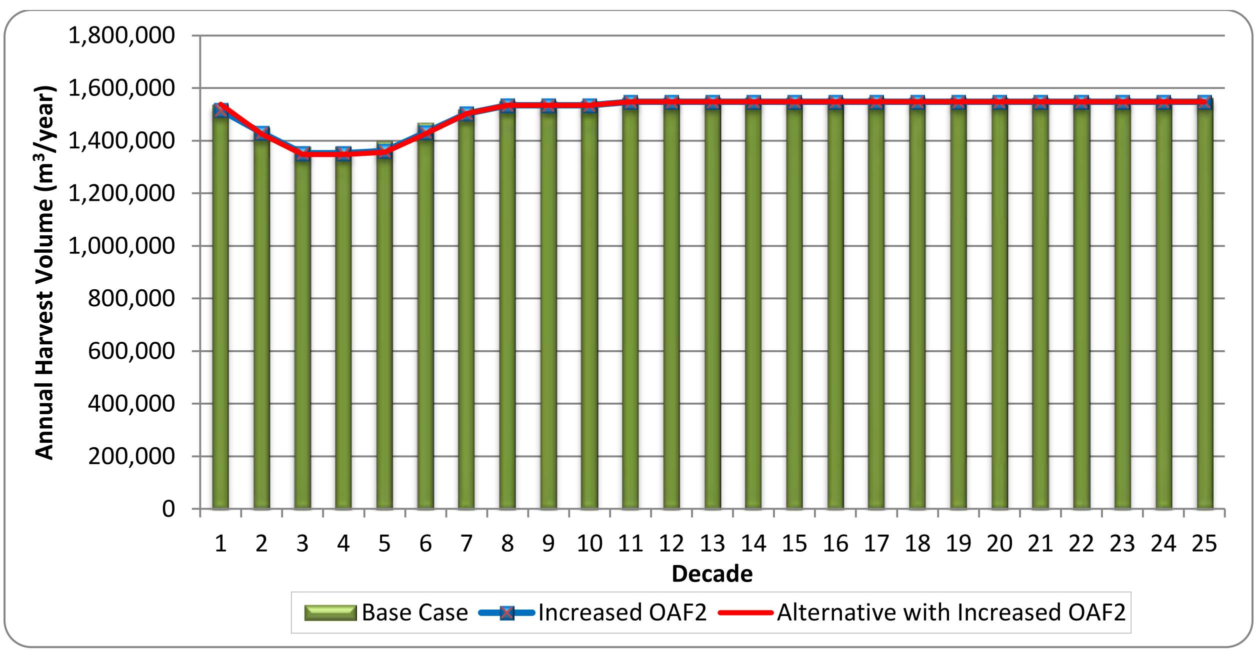

Figure 58 – Alternate harvest levels with increased OAF2 for unmanaged immature stands

Individual supply block schedules are shown in Appendix B9.

Immature yields were calibrated by “pole-size” cruise results. The results of the two sensitivity analyses with reduced immature yields (all immature yields reduced by 10% (Section 4.5) and increased OAF2 for unmanaged immature (Section 4.7)) indicate that the initial harvest of the Base Case can be maintained without creating mid-term timber supply “crashes”. These details provide some assurance that short-term timber supply need not be adjusted for any downward pressure on immature stands yields estimates.

4.8 No Future Genetic Gains

During reviews of other TFL analysis assumptions questions have been raised regarding the amount of western hemlock that had been planted in the last 10 years and the assumptions for planting that species in the future – the concern being the amount of genetic worth (GW – often referred to as "genetic gain") applied for hemlock may be optimistic and therefore overestimate timber supply. The Base Case yields were generated with GW values for hemlock of 10% on low elevation sites and 6% on high elevation sites. These values were reduced from the GW values of planted hemlock (14% and 9% respectively) to reflect the fact that not all hemlock sites are planted and that naturally regenerated hemlock will likely form part of the harvested stand even on sites where hemlock is planted.

This analysis tests the sensitivity of timber supply to the genetic gain values assumed for all species in future stands. Douglas fir, western red cedar and yellow cedar also have genetic gains assumed as these species are regularly planted using improved stock.

As the yield changes impact only future stands there is no short term timber supply impact. The schedule shown in Table 37 and Figure 59 indicates the LTHL achieved is 3.2% lower than the Base Case and roughly 10.55 million m^3 (2.8%) less is harvested over the 250 years. The transition to this lower LTHL requires a reduced mid-term timber supply due to lower inventory levels.

Table 37 – Harvest levels with no future genetic gains

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1	2012	2021	1,537,900	1,537,900	0
2	2022	2031	1,451,500	1,451,500	0
3 - 4	2032	2051	1,379,700	1,373,700	- 6,000
5	2052	2061	1,399,400	1,382,100	- 17,300
6	2062	2071	1,470,000	1,413,700	-56,300
7	2072	2081	1,520,000	1,463,700	- 56,300
8 - 10	2082	2111	1,551,300	1,498,600	- 52,700
11 - 25	2112	2261	1,563,900	1,513,600	- 50,300

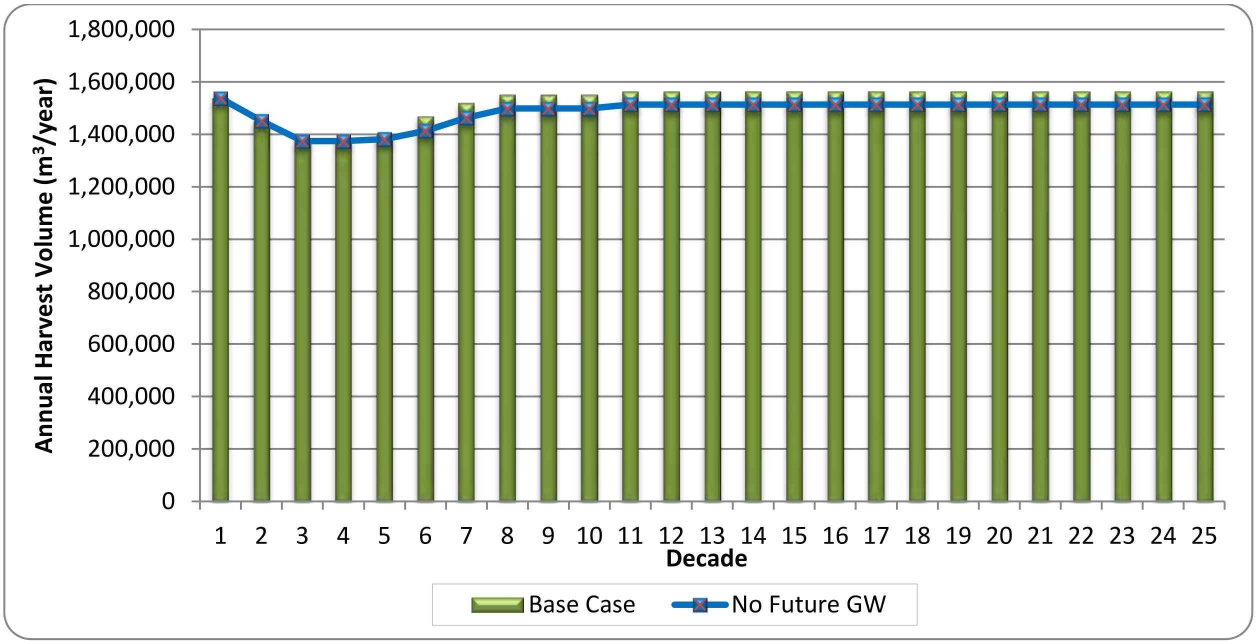

Figure 59 – Harvest levels with no future genetic gains

Details by individual supply blocks are shown in Appendix B10.

WFP owns and operates a seed orchard and tree nursery on the Saanich Peninsula. The orchards at this facility include low and high elevation Douglas Fir, low elevation western redcedar, low and high elevation western hemlock, and low elevation Sitka spruce orchards as well as yellow cedar hedge orchards. The genetic gains applied in the Base Case yields reflect the current values obtained from these seed sources.

4.9 Increase Harvest from Non-conventional Areas

The next three analyses test the sensitivity of timber supply to assumptions associated with the non-conventional land base. The significance of the non-conventional land base is indicated in Table 20: 11.3% of the total THLB area; 18.5% of the total THLB volume; 23% of the total initial available volume. The volume proportions are significantly greater than the area proportion due to less harvest history and therefore higher than average ages and stand volumes.

Table 38 – Non-conventional THLB Statistics[3]

	Block 1	Block 2	Block 3	Block 4	Block 5	TOTAL
Non-conventional THLB (ha)	8,755	6,519	0	3,362	757	19,393
Total THLB (ha)	48,033	91,666	2,336	25,854	3,313	171,202
% Non-conventional	*18.2%*	*7.1%*	*0.0%*	*13.0%*	*22.8%*	*11.3%*
Non-conventional THLB Vol (m^3)	5,734,189	3,963,125	0	2,009,598	422,231	12,129,143
Total THLB Vol (m3)	22,293,984	32,481,972	939,581	8,931,703	938,236	65,585,476
% Non-conventional	*25.7%*	*12.2%*	*0.0%*	*22.5%*	*45.0%*	*18.5%*
Avail Non-conventional Vol (m3)	3,289,697	3,327,296	0	1,728,163	362,560	8,707,716
Total Avail Vol (m3)	11,499,320	20,049,698	738,688	4,303,791	1,284,958	37,876,455
% Non-conventional	*28.6%*	*16.6%*	*0.0%*	*40.2%*	*28.2%*	*23.0%*

Recall that the Base Case includes constraints limiting the amount of non-conventional volume harvested in each supply block in any year. Another approach is to manage the conventional and non-conventional portions of the THLB as two separate. In this analysis separate “long-term stable” growing stock constraints are applied to the conventional and non-conventional THLB growing stocks and separate flow constraints are applied. Reviewing the Base Case results indicated that conventionally operable old growth timber only contributes significant timber supply in the first 30 years or so. To avoid requiring logging and sawmilling equipment capable of handling relatively small volumes of large old growth logs far into the future, this analysis was modelled such that old growth non-conventional volume had to be harvested as an even-flow over the first 40 years.

Table 39 and Figure 60 indicate that with increased non-conventional harvesting the initial harvest level can be 113,300 m^3/year (7.4%) higher (22,500 m^3/year conventional harvest and 90,900 m^3/year non-conventional harvest), with larger gains in the following 30 years (note that in Figure 60, the conventional and non-conventional volumes are indicated separately and in a cumulative style). Mid and long-term timber supply is reduced due to less non-conventional inventory. Over the entire 250 years approximately 1.42 million m^3 (0.4%) more is harvested.

[3] Volumes in Table 38 are 2014 estimates as this is the date to which the modelling data was projected.

Table 39 – Harvest levels with increased non-conventional harvesting

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Non-conventional Increased	Difference
1	2012	2021	1,537,900	1,651,200	+ 113,300
2	2022	2031	1,451,500	1,569,100	+ 117,600
3 - 4	2032	2051	1,379,700	1,495,200	+ 115,500
5	2052	2061	1,399,400	1,348,800	- 50,600
6	2062	2071	1,470,000	1,420,500	- 49,500
7	2072	2081	1,520,000	1,477,200	- 42,800
8	2082	2091	1,551,300	1,517,300	- 34,000
9	2092	2101	1,551,300	1,526,000	- 25,300
10	2102	2111	1,551,300	1,534,700	- 16,600
11	2112	2121	1,563,900	1,539,000	- 24,900
12	2122	2131	1,563,900	1,544,700	- 19,200
13	2132	2141	1,563,900	1,552,600	- 11,300
14	2142	2151	1,563,900	1,555,900	- 8,000
15	2152	2161	1,563,900	1,558,200	- 5,700
16 - 25	2162	2261	1,563,900	1,560,700	- 3,200

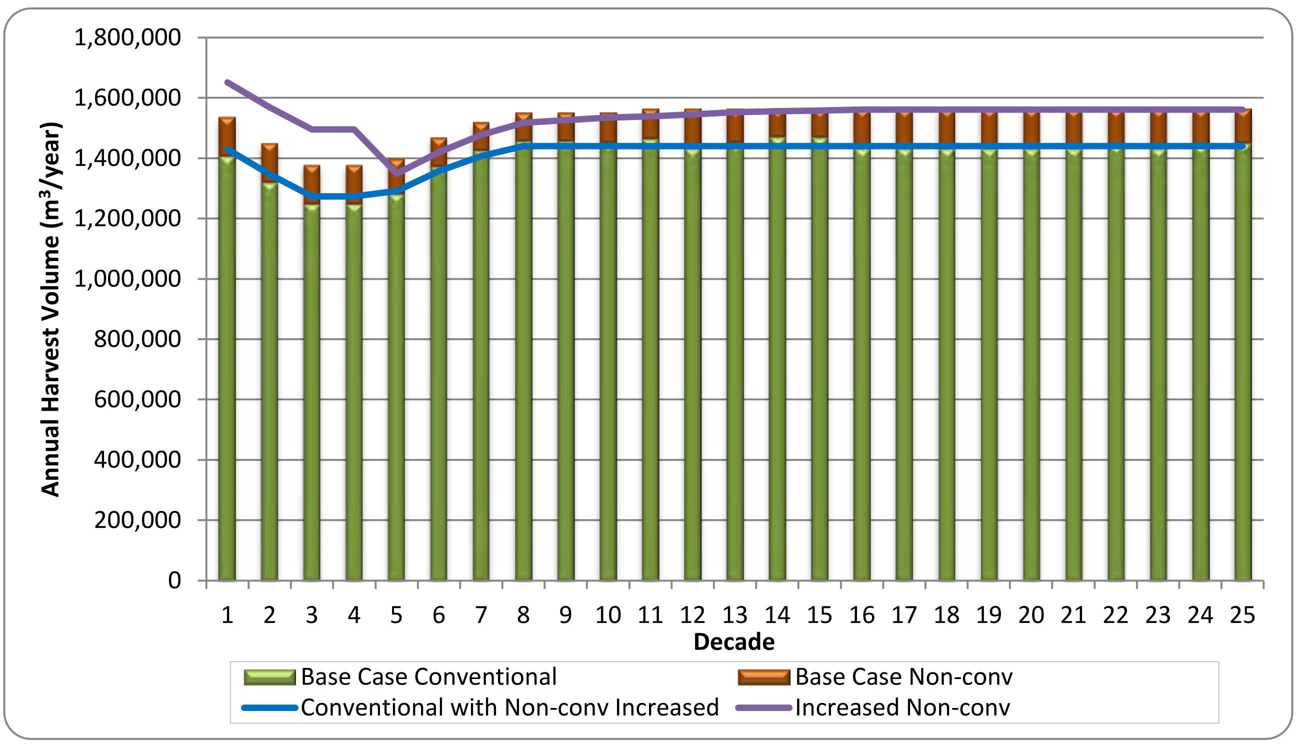

Figure 60 – Harvest levels with increased non-conventional harvesting

Individual supply block schedules, including the non-conventional /conventional volumes split, are shown in Appendix B11.

The Base Case includes restrictions on the timber supply from non-conventionally operable areas that reflect performance during the 2000 to 2010 period. During this time lumber markets were severely reduced due to the unprecedented economic downturn between 2007 and 2010. More recently, lumber prices have begun to recover as the housing market in the United States improves and demand in China and Japan holds steady or improves modestly. The combination of improving markets and reduced supply from the interior of BC due to the mountain pine beetle epidemic has most market analysts forecasting lumber prices to rise dramatically. During 2012 and the first quarter of 2013, lumber prices rose substantially indicating that the lumber "super cycle" may be starting. The mid-2013 fall back in prices has largely been erased by steady price increases through the last half of 2013 and early 2014.

The higher prices should allow economic access to more of the higher cost non-conventional land base than is incorporated in the Base Case.

4.10 Remove non-conventional volume constraint

Past timber supply analyses for TFL 39 did not differentiate the contribution of conventional and non-conventional volume. This analysis tests the impact that constraining the non-conventional contribution has on harvest levels achieved in the Base Case. In this analysis the long-term "stable" growing stock constraint is applied to the total THLB growing stock (rather than only the conventional THLB growing stock as done in the Base Case) because in this sensitivity the entire THLB is being utilized to provide a sustainable timber supply, whereas in the Base Case the conventional THLB is being utilized to provide a sustainable timber supply while the timber supply from the non-conventional THLB is restricted.

Table 40 and Figure 61 indicate that with the non-conventional harvest constraint removed the initial harvest level can be 57,600 m^3/year (3.7%) higher. In percentage terms, the timber supply gains are similar in the following 30 years. The LTHL is approximately 1.7% higher, with the total non-conventional contribution averaging roughly 9%. Over the entire 250 years approximately 8.18 million m^3 (2.1%) more is harvested. Note the large variance in non-conventional contribution over time in Figure 61 (values are cumulative in Figure 61).

Table 40 – Harvest levels with no non-conventional constraint

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No non-conventional Constraint	Difference
1	2012	2021	1,537,900	1,595,500	+ 57,600
2	2022	2031	1,451,500	1,507,900	+ 56,400
3 - 4	2032	2051	1,379,700	1,429,000	+ 49,300
5	2052	2061	1,399,400	1,429,000	+ 29,600
6	2062	2071	1,470,000	1,491,700	+ 21,700
7	2072	2081	1,520,000	1,557,800	+ 37,800
8 - 10	2082	2111	1,551,300	1,590,500	+ 39,200
11 - 25	2112	2261	1,563,900	1,590,500	+ 26,600

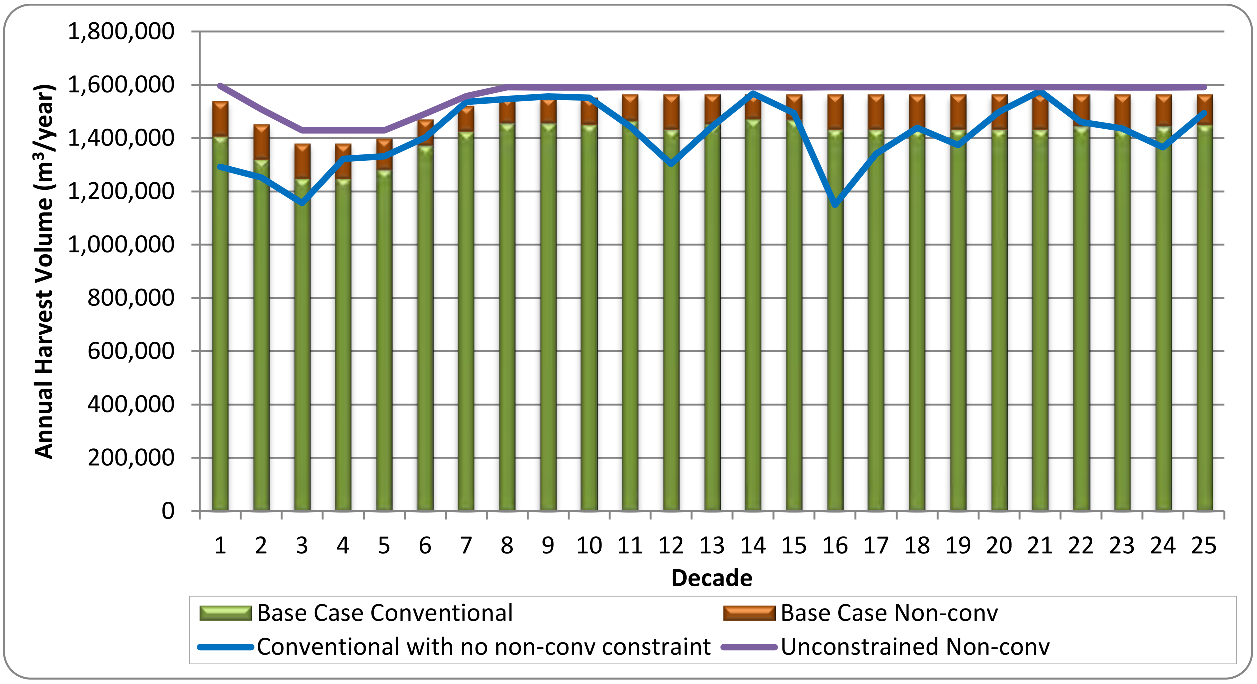

Figure 61 – Harvest levels without non-conventional constraint

Short-term timber supply gains are less than the non-conventional partition analysis discussed in Section 4.9 due to not imposing the even-flow old growth non-conventional harvest requirement in this analysis. That constraint pushed more non-conventional volume into the short-term at the expense of the mid and long-term.

Individual supply block schedules, including the conventional/non-conventional volumes split, are shown in Appendix B12.

4.11 Exclude non-conventional operable land base

In recent years, harvest in the high cost non-conventional operable inventory has been less than its contribution to the current merchantable inventory. The Base Case reflects this level of performance; however, recall that during this time frame demand for forest products reached record lows due to the worldwide recession. This analysis tests the sensitivity of timber supply to the exclusion of the non-conventional land base.

Table 41 and Figure 62 indicate the results of this sensitivity - harvest levels are roughly 9% less than those of the Base Case for the first 60 years. The LTHL is 120,300 m^3/year (7.7%) less than that achieved in the Base Case and the total volume harvested over the 250 years is 30.33 million m^3 (7.9%) less.

Table 41 – Harvest levels with non-conventional THLB excluded

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	No non-conventional Logging	Difference	Alternate No non-conventional Logging	Difference
1	2012	2021	1,537,900	1,397,600	- 140,300	1,537,900	0
2	2022	2031	1,451,500	1,316,100	- 135,400	1,392,800	- 58,700
3 - 4	2032	2051	1,379,700	1,253,200	- 126,500	1,267,100	- 112,600
5	2052	2061	1,399,400	1,269,300	- 130,100	1,267,100	- 132,300
6	2062	2071	1,470,000	1,337,000	-133,000	1,284,600	- 185,400
7	2072	2081	1,520,000	1,406,500	- 113,500	1,301,400	- 218,600
8	2082	2091	1,551,300	1,443,600	- 107,700	1,368,500	- 182,800
9	2092	2101	1,551,300	1,443,600	- 107,700	1,436,000	- 115,300
10	2102	2111	1,551,300	1,443,600	- 107,700	1,437,900	- 113,400
11 - 25	2112	2261	1,563,900	1,443,600	- 120,300	1,437,900	- 126,000

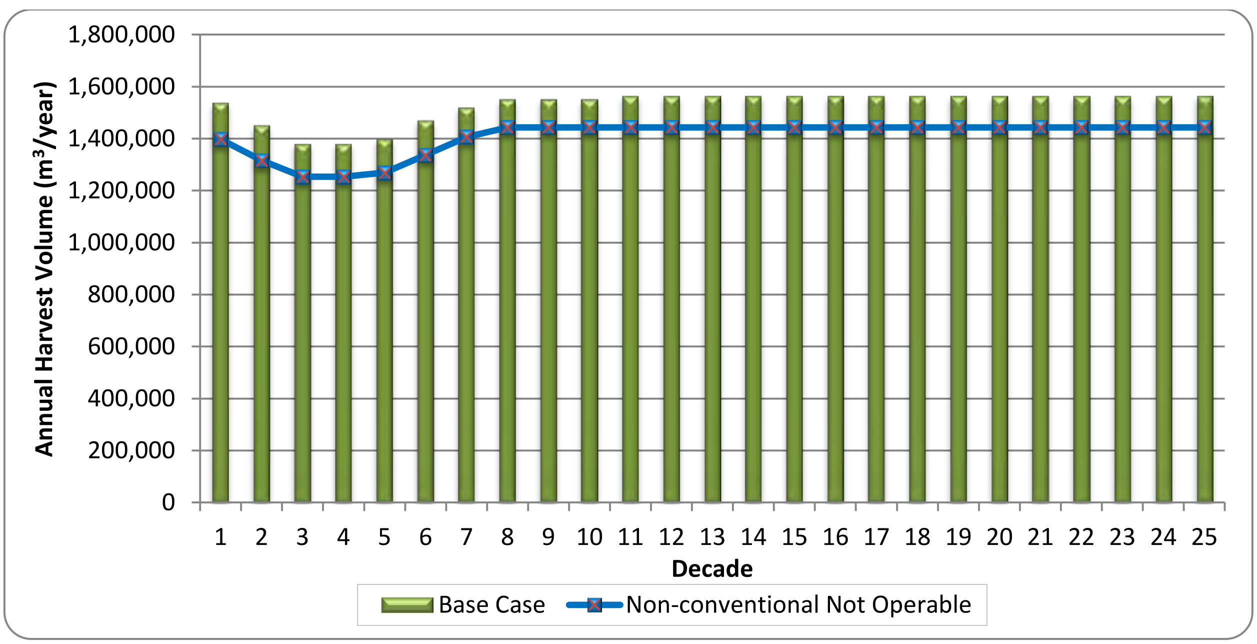

Figure 62 - Harvest levels with non-conventional THLB excluded

Instead of allowing the initial harvest level to be affected, it is possible to develop a schedule that maintains the initial harvest of the Base Case and limits future declines to 10%/decade (see Figure 63). This alternate schedule increases short-term harvest at the expense of mid-term harvest and a minor (0.4%) incremental impact to long-term harvest. Total harvest is 31.22 million m^3 (8.2%) less than the Base Case.

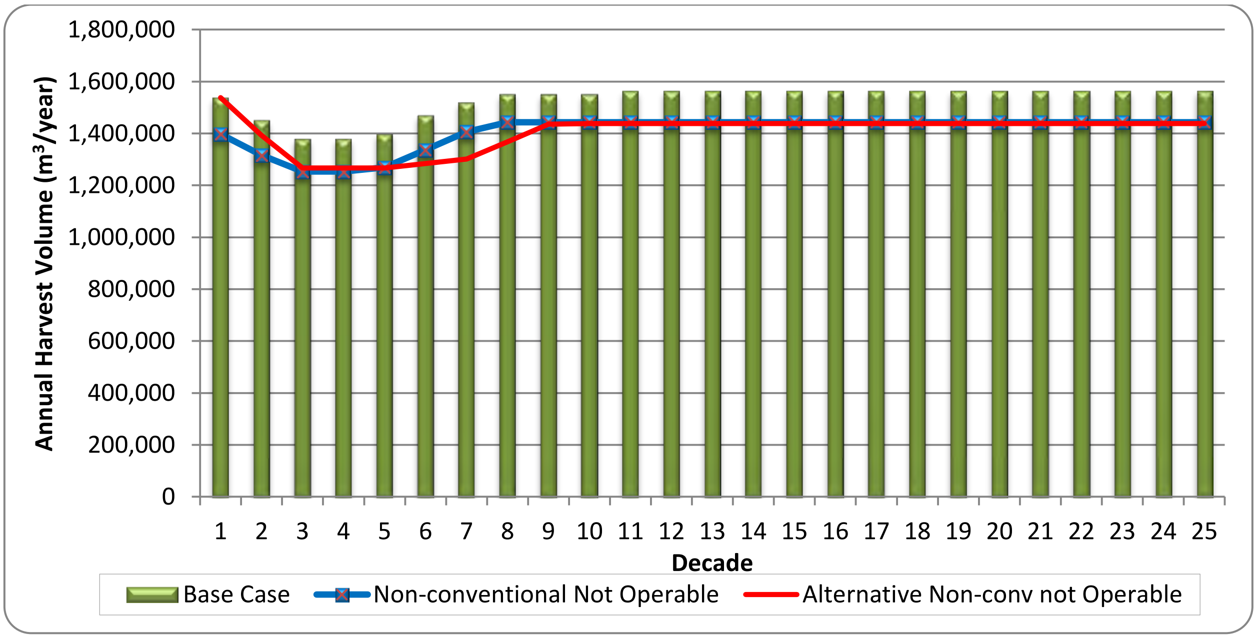

Figure 63 – Alternate harvest levels with non-conventional THLB excluded

Details by individual supply blocks are shown in Appendix B13.

4.12 VQOs more constraining

To test the sensitivity of timber supply to the assumptions used for managing visual quality objectives (VQOs), this sensitivity uses the mid-point of the disturbance range for each VQO class rather than the upper limit as in the Base Case (Table 42). Constraints were applied to individual VQO polygons within Blocks 3, 4 and 5. Due to the number of VQO polygons in Blocks 1 and 2, they were grouped by VQO class within each watershed. Applying constraints to individual VQO polygons resulted in models taking days to solve while grouping allowed models to be solved generally in less than 3 hours. A solution was generated with the disturbance limits applied to individual VQO polygons rather than the aggregated polygons and there was no material difference in harvest volumes achieved. This indicates that the aggregation of the VQO polygons had no significant impact on timber supply results.

Table 42 – Maximum disturbance by VQO class

VQO	Maximum disturbance %	
	Base Case	Sensitivity
Modification (M)	25%	20%
Partial Retention (PR)	15%	10%
Retention (R)	5%	2.5%

Table 43 and Figure 64 indicate the results of this sensitivity. Short term harvest levels are unaffected as there is sufficient inventory outside the visually sensitive areas to maintain the Base Case harvest levels. Commencing in 2032 (Decade 3) the more restrictive visual quality management assumptions (relative to the Base Case) begin having a timber supply impact. The LTHL is reduced by only 1,200 m^3/year (0.1%).

Table 43 - Harvest levels with more restrictive visual quality management

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	VQOs more constraining	Difference
1	2012	2021	1,537,900	1,537,900	0
2	2022	2031	1,451,500	1,451,400	- 100
3 - 4	2032	2051	1,379,700	1,376,500	- 3,200
5	2052	2061	1,399,400	1,396,200	- 3,200
6	2062	2071	1,470,000	1,466,800	-3,200
7	2072	2081	1,520,000	1,516,800	- 3,200
8 - 10	2082	2111	1,551,300	1,550,100	- 1,200
11 - 25	2112	2261	1,563,900	1,562,700	- 1,200

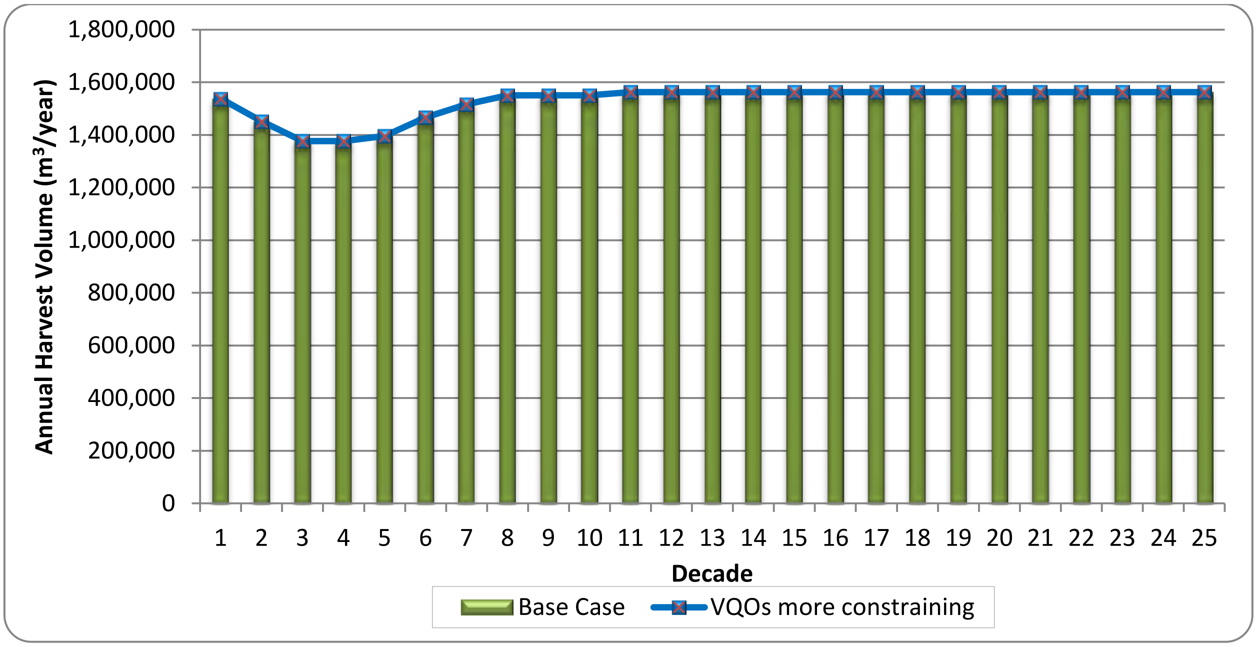

Figure 64 - Harvest levels with more restrictive visual quality management

Individual supply block schedules are shown in Appendix B14.

Visual impact assessments are used to guide cutblock design in order to mitigate the visual impact of cutblocks and roads and therefore reducing the timber supply impact of visual quality management. The screening effect of strategically located stand-level retention can be used to effectively reduce the visual impact of cutblocks. These practices allow for higher disturbance percentages to be achieved within a VQO polygon and therefore support using the higher percentage limits for timber supply modelling.

4.13 Remove Western Forest Strategy Impacts

Nearly all of the harvest within TFL 39 over the past 13 years was done using the retention silviculture system (mainly group retention). This is a result of the policies (forest management strategies) of WFP predecessor companies (MacMillan Bloedel, Weyerhaeuser and Cascadia Forest Products). The WFP forest strategy approach is to vary the use of retention systems and the amount of stand level retention by Resource Management Zones of the Vancouver Island Land Use Plan (or similar zones for tenures not subject to VILUP) and by ecosection (see Section 11.3.3 in the IP for details).

In the Base Case the impacts of the Western Forest Strategy were modeled by including variable THLB area netdowns (see Section 6.18.2 of the IP) and reducing yields of future stands and stands currently aged 1 – 14 years due to shading from retained trees (see Section 9.4.2.1.2 of the IP). This sensitivity tests the timber supply implications that these forest strategy impacts have on the Base Case harvest levels. Due to stand-level retention objectives of the SCCO applying to Blocks 3 and 5, the area impact of stand-retention was maintained in this analysis. However, to investigate the sensitivity of timber supply in Blocks 3 and 5 to the yield impact of shading, the yield reduction was removed.

The initial THLB area increases by 2.2% while both total and available THLB inventory increase by 2.1%. The increase in operable area and higher future yields allow short and mid-term harvest to increase by roughly 3.5% (refer to Table 44 and Figure 65). Long-term harvest is increased by 74,100 m^3/year (4.7%). Over the 250 years, 16.88 million m^3 (4.4%) more is harvested.

Table 44 - Harvest levels with no Western Forest Strategy

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	No WFS	Difference	Alternate No WFS	Difference
1	2012	2021	1,537,900	1,591,100	+ 53,200	1,560,700	+ 22,800
2	2022	2031	1,451,500	1,501,700	+ 50,200	1,483,200	+ 31,700
3	2032	2041	1,379,700	1,423,900	+ 44,200	1,431,900	+ 52,200
4	2032	2051	1,379,700	1,428,200	+ 48,500	1,436,100	+ 56,400
5	2052	2061	1,399,400	1,448,900	+ 49,500	1,456,900	+ 57,500
6	2062	2071	1,470,000	1,521,700	+51,700	1,529,700	+ 59,700
7	2072	2081	1,520,000	1,571,700	+51,700	1,579,700	+ 59,700
8	2082	2091	1,551,300	1,626,700	+ 75,400	1,627,100	+ 75,800
9 - 10	2092	2111	1,551,300	1,627,300	+ 76,000	1,627,800	+ 76,500
11 - 25	2112	2261	1,563,900	1,638,000	+ 74,100	1,638,400	+ 74,500

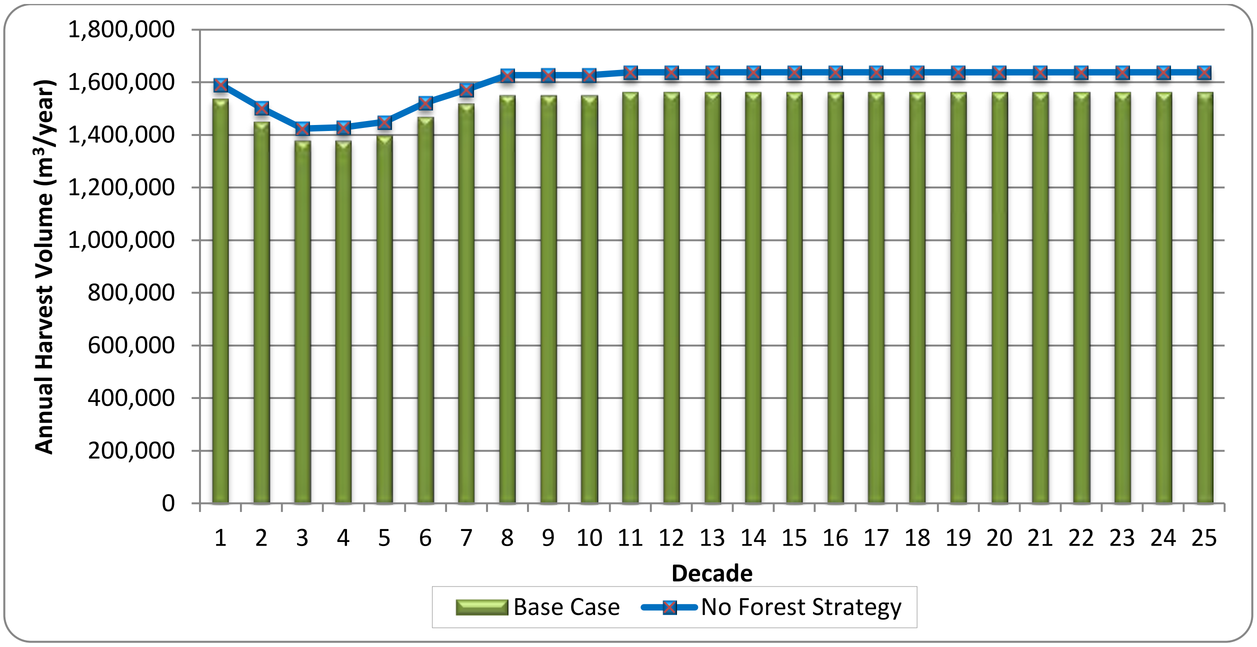

Figure 65 - Harvest levels with no Western Forest Strategy

Alternatively, the increase in operable timber can be used to lessen the mid-term timber supply "dip" in Block 2. This alternate schedule (indicated in Figure 66) maintains the initial harvest level of the Block 2 Base Case. At the TFL level, this reduces the initial harvest level by 30,400 m^3/year but increase harvest in Decades 3 – 7 by 7,900 m^3/year and long-term harvest by 400 m^3/year. Overall, 16,000 m^3 less is harvested than in the schedule shown in Figure 65.

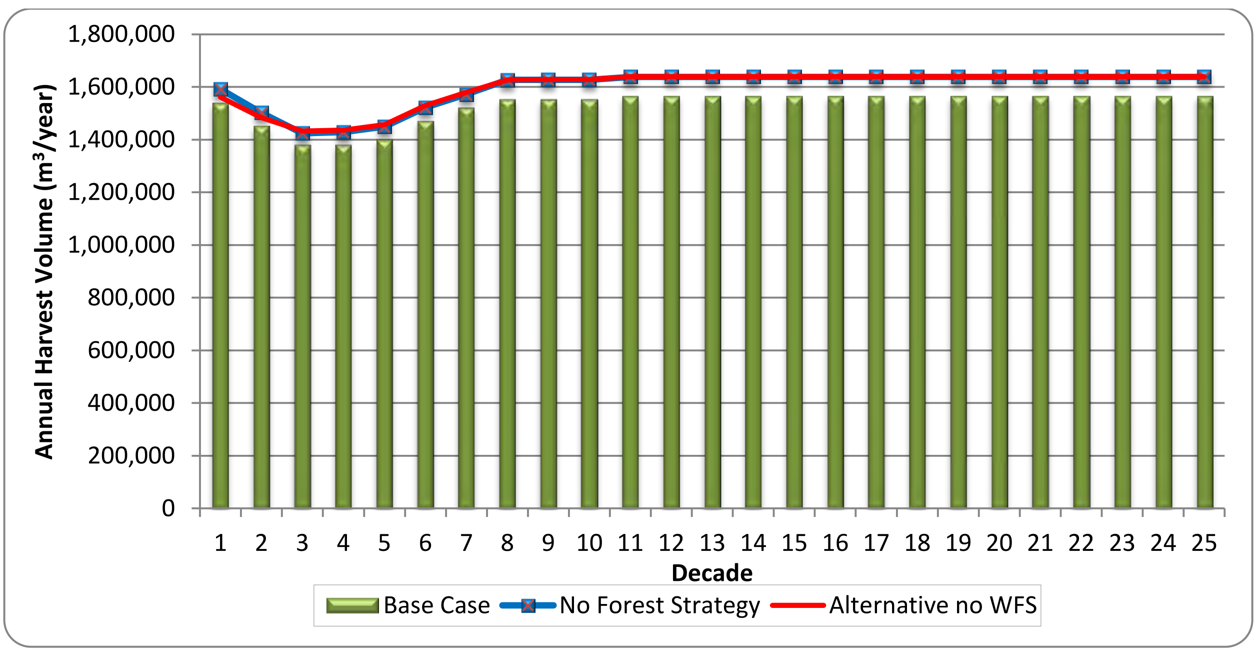

Figure 66 – Alternate harvest levels with no Western Forest Strategy

Details by individual supply blocks are shown in Appendix B15.

The Western Forest Strategy is a company program designed to conserve biodiversity on company tenures outside of the central coast land use decision area. It evolved from policies employed by legacy companies (WFP, Canfor and Cascadia Forest Products) and supports sustainable forest management. The strategy was created with safety in mind and biological, social and economic aspects of sustainable forest management. There is a monitoring and adaptive management program in support of the strategy. The Base Case includes assumptions of the impact of implementing the strategy based on past performance and research associated with monitoring results. No changes to the strategy are planned for the foreseeable future.

4.14 Increase minimum harvest DBH criteria by 2cm

Minimum harvest criteria are simply the minimum criteria for use in the timber supply model – stands are not available for harvest by the model until the minimum criteria are met. Actual harvesting occurs in some stands below the minimum modelled criteria while other stands are not harvested until well past the minimum criteria due to managing for other resource values. Minimum criteria are often specified by an age and a minimum volume per hectare. This analysis used a minimum average stand diameter-at-breast-height (DBH) that varied by harvesting system and a minimum volume per hectare (see section 11.3.1 of the IP). The concept is that larger diameters in general reflect higher net values.

Table 45 indicates the minimum average stand DBH used in the Base Case and in this analysis. The minimum DBHs were increased by 2 cm for the sensitivity analysis. In terms of years, this delays harvest eligibility from 5 to 40 years depending on the analysis unit, with the average delay being slightly more than 10 years.

Table 45 – Larger Minimum Harvest Criteria

	Minimum Average DBH	
Harvest System	**Base Case**	**Sensitivity**
Ground	30 cm	32 cm
Cable	37 cm	39 cm
Non-conventional	42 cm	44 cm

The larger DBH criteria reduce the initial available inventory by 2.81 million m^3 (7.6%). Table 46 and Figure 67 indicate the results of maintaining the rest of the Base Case assumptions. The delayed availability of stands necessitates reduced short and mid-term harvest levels in order to allow sufficient inventory to build such that the LTHL is slightly affected (0.9% lower). Overall 5.76 million m^3 (1.5%) less is harvested in this sensitivity analysis.

Table 46 - Harvest levels with larger minimum DBH criteria

			Annual Harvest Volume (m^3)				
Period (Decade #)	**Start Year**	**End Year**	**Base Case**	**Larger DBH**	**Difference**	**Alternate Larger DBH**	**Difference**
1	2012	2021	1,537,900	1,501,100	- 36,800	1,537,900	0
2	2022	2031	1,451,500	1,405,100	- 46,400	1,447,400	- 4,100
3 - 4	2032	2051	1,379,700	1,331,900	- 47,800	1,358,900	- 20,800
5	2052	2061	1,399,400	1,350,400	- 49,000	1,360,300	- 39,100
6	2062	2071	1,470,000	1,420,800	- 49,200	1,376,100	- 93,900
7	2072	2081	1,520,000	1,470,800	- 49,200	1,433,200	- 86,800
8	2082	2091	1,551,300	1,525,800	- 25,500	1,488,200	- 63,100
9	2092	2101	1,551,300	1,528,400	- 22,900	1,525,100	- 26,200
10	2102	2111	1,551,300	1,550,500	- 800	1,547,500	- 3,800
11 - 25	2112	2261	1,563,900	1,550,500	- 13,400	1,547,500	- 16,400

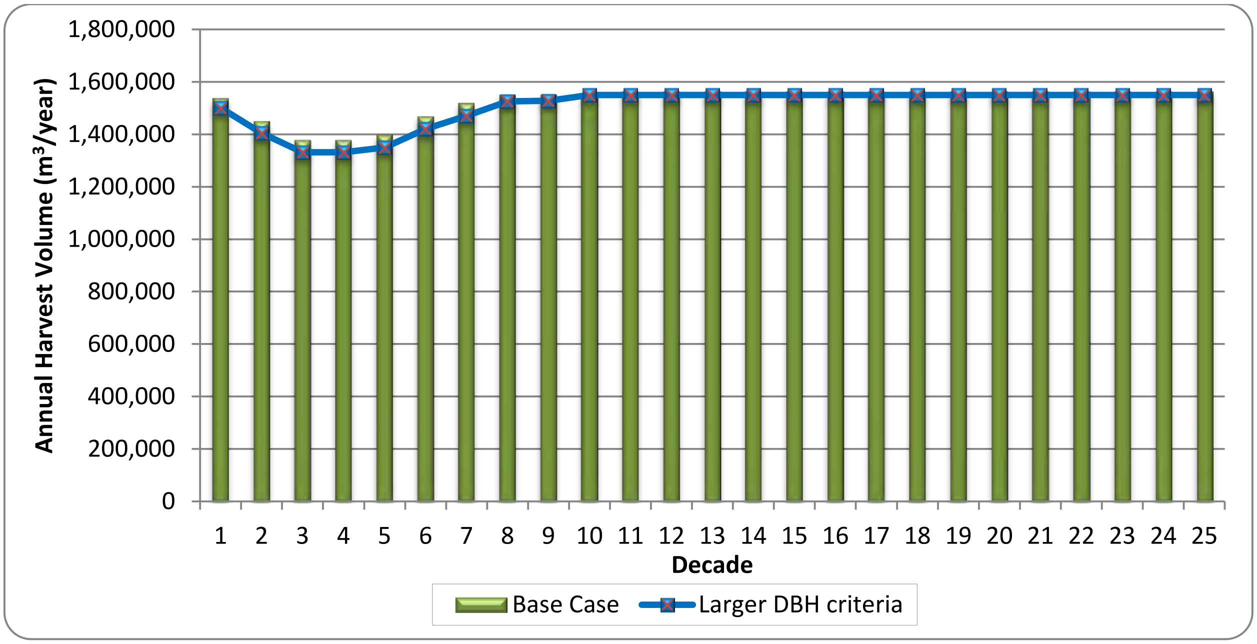

Figure 67 – Harvest levels with larger minimum DBH criteria

Alternatively, the initial harvest level of the Base Case can be achieved by reducing mid-term timber supply (see Figure 68). Relative to the schedule shown in Figure 67, this alternate schedule increases harvest during the first 50 years but reduces harvest thereafter, with the LTHL reduced by 3,000 m^3/year and total harvest by 282,000 m^3.

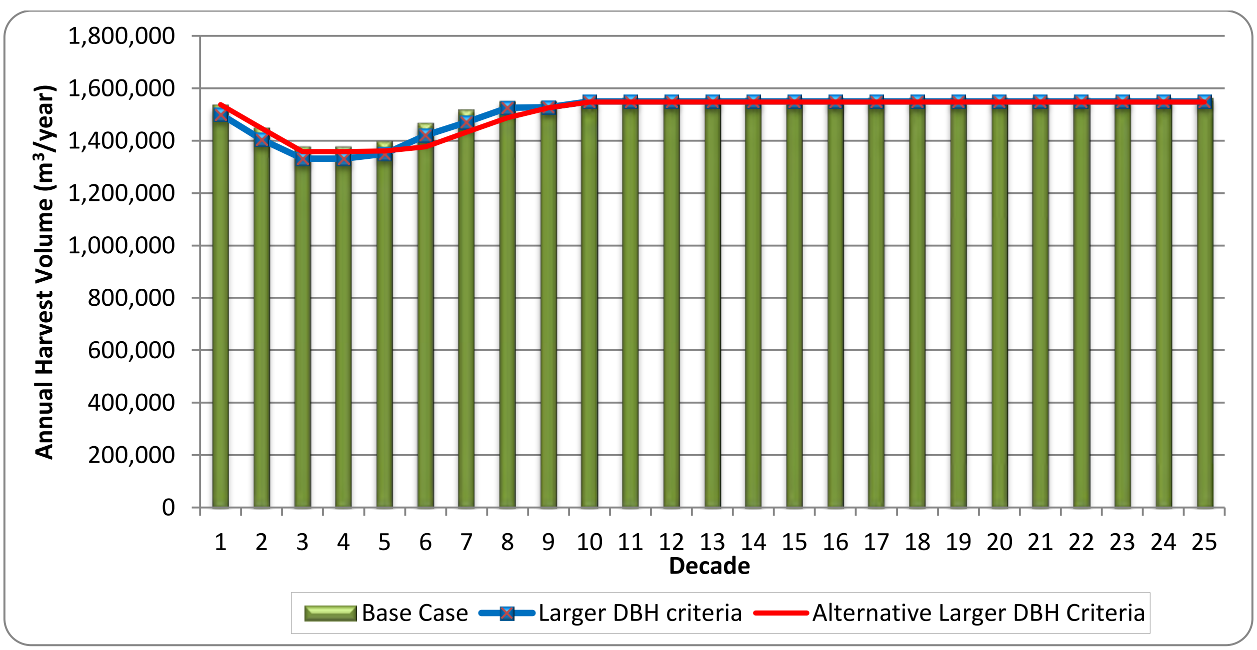

Figure 68 – Alternate harvest levels with larger minimum DBH criteria

Individual supply block schedules are shown in Appendix B16.

4.15 Decrease minimum harvest DBH criteria by 2cm

For this sensitivity analysis the minimum DBHs were decreased by 2 cm (see Table 47). In terms of years, the smaller DBHs accelerate harvest eligibility from 5 to 50 years depending on the analysis unit, with the average being about 10 years.

Table 47 – Smaller Minimum Harvest Criteria

Harvest System	Minimum Average DBH	
	Base Case	Sensitivity
Ground	30 cm	28 cm
Cable	37 cm	35 cm
Non-conventional	42 cm	40 cm

The smaller DBH criteria increase the initial available inventory by 2.71 million m^3 (7.3%). Table 48 and Figure 69 indicate the results of applying all other Base Case assumptions. The earlier availability of stands allows increased short and mid-term harvest levels; short term is increased by 2.5% and mid-term by 3.1%. The LTHL is affected minimally (0.2% higher). Overall 3.82 million m^3 (1.0%) more is harvested in this sensitivity analysis.

Table 48 - Harvest levels with smaller minimum DBH criteria

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Smaller DBH	Difference	Alternate Smaller DBH	Difference
1	2012	2021	1,537,900	1,575,400	+ 37,500	1,545,600	+ 7,700
2	2022	2031	1,451,500	1,486,000	+ 34,500	1,492,600	+ 41,100
3	2032	2041	1,379,700	1,415,800	+ 36,100	1,420,000	+ 40,300
4	2042	2051	1,379,700	1,422,400	+ 42,700	1,426,600	+ 46,900
5	2052	2061	1,399,400	1,442,900	+ 43,500	1,447,100	+ 47,700
6	2062	2071	1,470,000	1,515,400	+ 45,400	1,519,600	+ 49,600
7	2072	2081	1,520,000	1,567,100	+ 47,100	1,567,400	+ 47,400
8 - 10	2082	2111	1,551,300	1,567,100	+ 15,800	1,567,400	+ 16,100
11 - 25	2112	2261	1,563,900	1,567,100	+ 3,200	1,567,400	+ 3,500

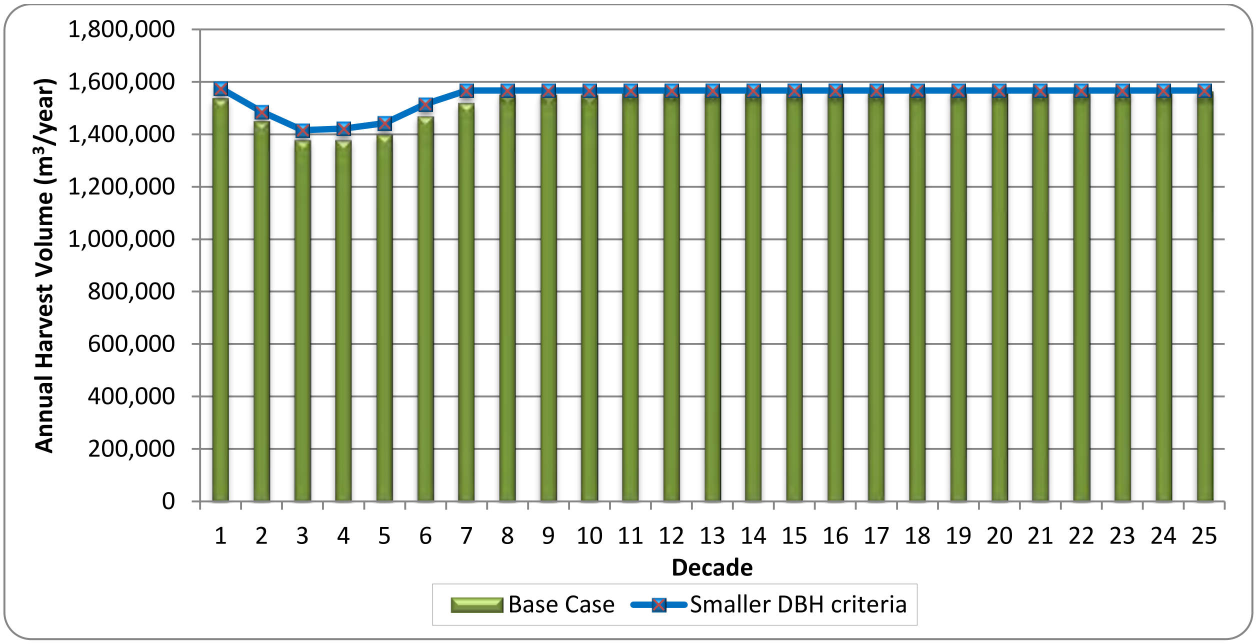

Figure 69 – Harvest levels with smaller minimum DBH criteria

Alternatively, the increase in operable timber can be used to lessen the mid-term timber supply "dip" in Block 2. This alternate schedule (indicated in Figure 70) maintains the initial harvest level of the Block 2 Base Case. At the TFL level and relative to the schedule shown in Figure 63, this reduces the initial harvest level by 29,800 m^3/year but increases harvest in the second decade by 6,600 m3/year and in Decades 3 – 6 by 4,200 m^3/year and long-term harvest by 300 m^3/year. Overall, 7,000 m^3 less is harvested than in the schedule shown in Figure 69.

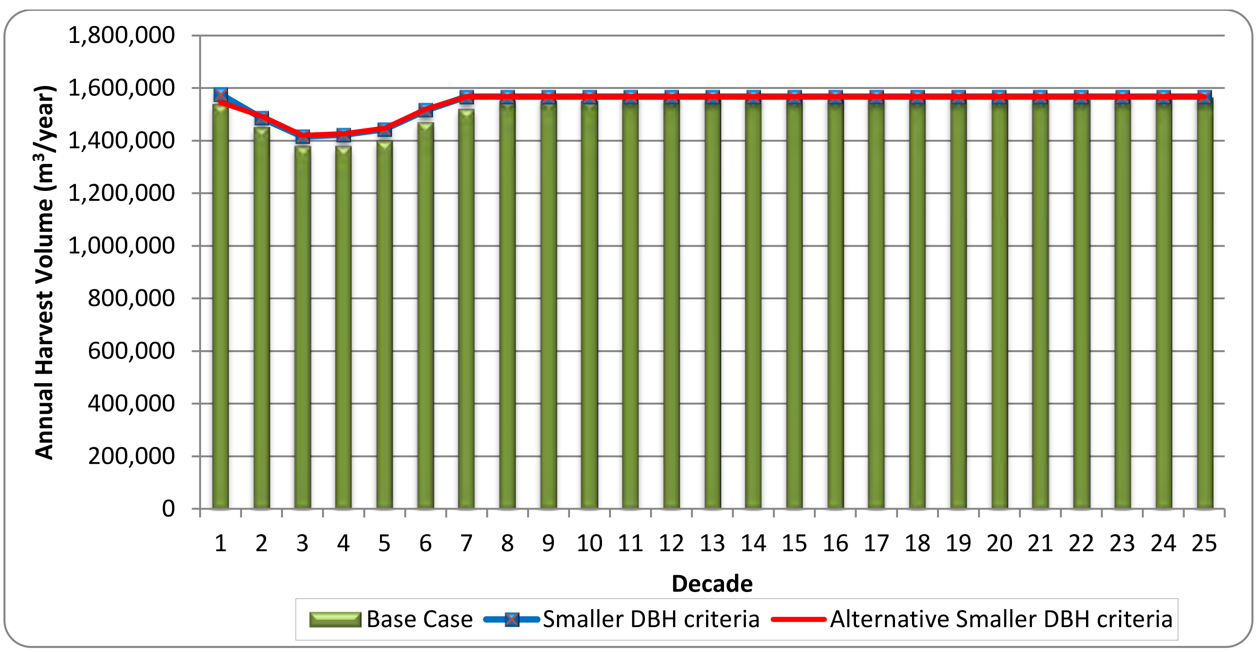

Figure 70 – Alternate harvest levels with smaller minimum DBH criteria

Details by individual supply blocks are shown in Appendix B17.

The minimum harvest criteria applied in the Base Case is intended to reflect economic aspects of a sustainable harvesting program. In general, as DBH of a tree increases so does the value of the logs that can be derived from it. Therefore, the higher the harvest costs, the larger the trees (and longer rotations) required to achieve an economically viable harvest. For this reason, the minimum DBH criteria increases from a low associated with ground-based harvesting to a high associated with non-conventional harvesting systems (e.g. sky-line or helicopter).

The actual average stand DBH that generates a margin-positive stand is site-specific, depending on multiple factors including tree species and associated log values, stand density (stems per hectare), harvest and stumpage costs, and final product prices. The sensitivity analysis results indicate that short-term timber supply can be maintained (with some mid and long-term timber supply loss) even if the DBH criteria used is somewhat optimistic.

4.16 Blocks 3 and 5 managed individually

Within the Base Case, Block 3 (North Broughton Island) and Block 5 (Phillips River) are modeled as a single supply unit due to the relatively small THLB and both being subject to the South Central Coast Order (SCCO). This sensitivity analysis explores the impact of modeling these blocks separately.

Table 49 and Figure 71 indicate that, at the TFL-level, short and mid-term harvest levels are reduced by up to 10,300 m^3/year (0.7%). Over the 250 years, 635,000 m^3 (0.2%) less is harvested.

Table 49 - Harvest levels with Blocks 3 and 5 modeled separately

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Blocks 3 & 5 Separate	Difference
1	2012	2021	1,537,900	1,536,700	- 1,200
2	2022	2031	1,451,500	1,447,700	- 3,800
3	2032	2041	1,379,700	1,373,500	- 6,200
4	2042	2051	1,379,700	1,371,300	- 8,400
5	2052	2061	1,399,400	1,389,100	- 10,300
6	2062	2071	1,470,000	1,459,700	- 10,300
7	2072	2081	1,520,000	1,509,700	- 10,300
8	2082	2091	1,551,300	1,542,300	- 9,000
9	2092	2101	1,551,300	1,547,300	- 4,000
10	2102	2111	1,551,300	1,551,300	0
11 - 25	2112	2261	1,563,900	1,563,900	0

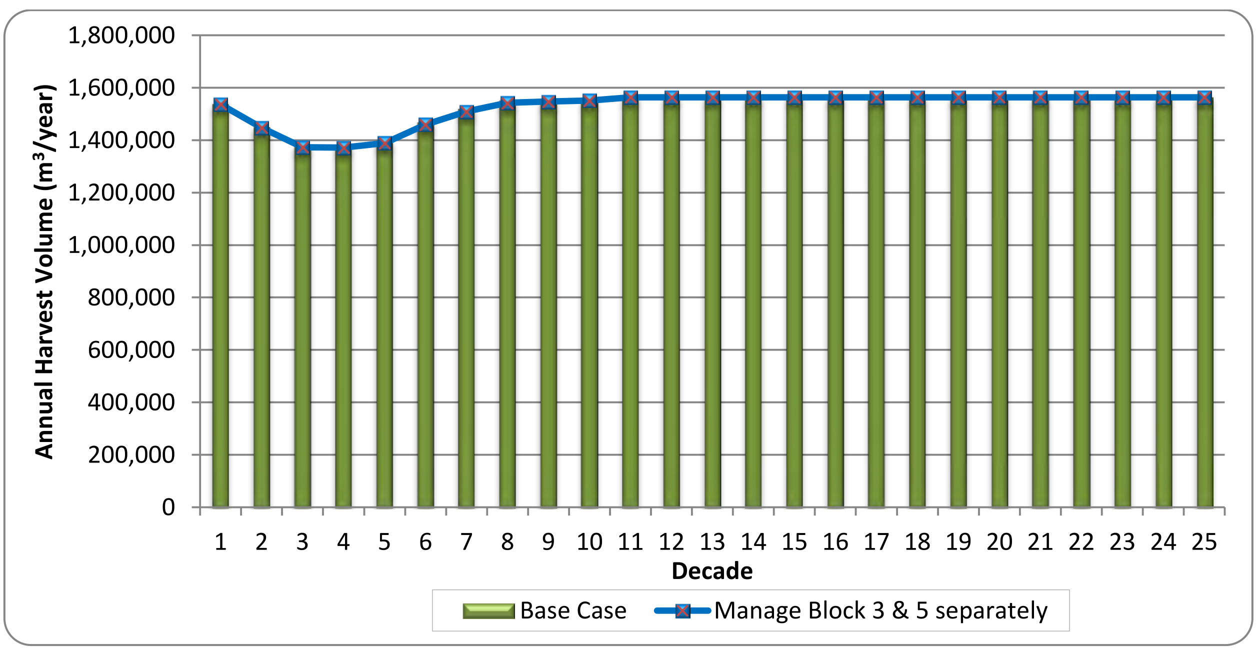

Figure 71 – Harvest levels with Blocks 3 and 5 modeled separately

The timber supply reduction results from applying growing stock constraints within each block rather than across the two combined. Due to the respective THLB age class distributions (refer to Appendix B in the IP), short-term timber supply from Block 3 is greater than long-term while Block 5 is the opposite. When combined, the age class distributions complement each other such that timber supply is fairly constant over time. When managed separately, timber supply declines in Block 3 as the abundance of operable second growth is harvested, thus reducing growing stock. Timber supply in Block 5 increases as second growth ages into operable conditions.

See Appendix B18 for details at the individual block level (for Block 3 and Block 5 only as the other three blocks are unaffected).

4.17 SCCO old seral targets addressed aspatially

As detailed in Section 6.17 of the Information Package, the Base Case utilized strategic-level reserve design (SLRD) to address the landscape level biodiversity objective of the SCCO. In this analysis, the SLRD netdown was removed and the model altered to address the old seral targets by site series surrogate (SSS) as indicated in Appendix B of the Information Package.

This change increases the THLB within the two blocks by a total of 3,925 ha (69%), THLB growing stock by 1,845,200 m^3 (98%) and available growing stock by 1,569,100 m^3 (122%); however the old forest requirements by SSS result in these increases being unavailable in the short and medium-term. Table 50 and Figure 72 indicate that, at the TFL-level, short and mid-term harvest levels are reduced by 700 m^3/year (0.1%). This impact is a result of more area being constrained with Block 3 with this approach. Block 3 is a small portion of the Broughton landscape unit and has relatively little old growth; therefore, the SLRD impact is proportionately less than the productive forest area (i.e., the SLRD utilized old forest outside of Block 3 more). Removing the SLRD and meeting the SSS targets entirely within Block 3 reduces the effective THLB within Block 3.

Table 50 - Harvest levels with SCCO old seral addressed aspatially

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Aspatial SCCO Old Seral	Difference
1	2012	2021	1,537,900	1,537,200	- 700
2	2022	2031	1,451,500	1,450,800	- 700
3 - 4	2032	2051	1,379,700	1,379,000	- 700
5	2052	2061	1,399,400	1,398,700	- 700
6	2062	2071	1,470,000	1,469,300	- 700
7	2072	2081	1,520,000	1,109,300	- 700
8	2082	2091	1,551,300	1,551,900	+ 600
9	2092	2101	1,551,300	1,556,900	+ 5,600
10	2102	2111	1,551,300	1,557,700	+ 6,400
11 - 25	2112	2261	1,563,900	1,570,300	+ 6,400

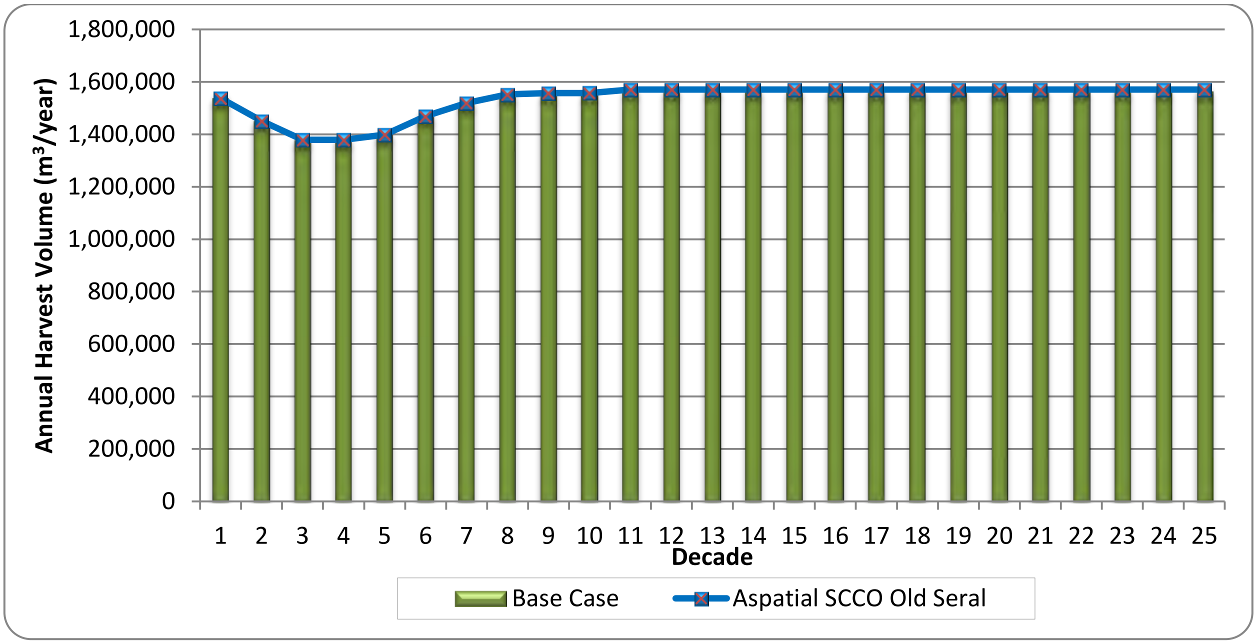

Figure 72 – Harvest levels with SCCO old seral addressed aspatially

The long-term harvest level is 6,400 m3/year (0.4%) higher as the larger THLB allows more harvest opportunity in the long-term; non-contributing forest ages to become old forest thereby freeing THLB. Over the 250 years, 1.04 million m^3 (0.4%) more is harvested.

See Appendix B19 for details at the individual block level (for Block 3 and Block 5 only as the other three blocks are unaffected).

4.18 SCCO risk-managed old seral targets

Objective 14(6) of the South Central Coast Order (SCCO) allows the amount of retained old forest in a landscape unit to be reduced to "risk-managed" targets under certain circumstances. As detailed in Section 6.17 of the Information Package, the amount of old forest to be retained is based on the concept of range of natural variation (RONV). The "default" targets for Broughton and Phillips landscape units are based on RONV of 30% and 70% respectively. The risk-managed targets for Phillips are based on 30% RONV while Broughton is unchanged. In this analysis the SLRD netdown was removed and the model altered to address the old seral targets by SSS.

Table 51 and Figure 73 indicate that, at the TFL-level, short and mid-term harvest levels are increased by 6,100 m^3/year (0.4%) and LTHL by 16,700 m^3/year (1.1%). Over the 250 years, 3.3 million m^3 (0.9%) more is harvested.

Table 51 - Harvest levels with SCCO risk-managed old seral targets

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	SCCO risk-managed old seral	Difference
1	2012	2021	1,537,900	1,544,000	+ 6,100
2	2022	2031	1,451,500	1,457,600	+ 6,100
3 - 4	2032	2051	1,379,700	1,385,800	+ 6,100
5	2052	2061	1,399,400	1,405,500	+ 6,100
6	2062	2071	1,470,000	1,476,100	+ 6,100
7	2072	2081	1,520,000	1,526,100	+ 6,100
8	2082	2091	1,551,300	1,558,700	+ 7,400
9	2092	2101	1,551,300	1,563,700	+ 12,400
10	2102	2111	1,551,300	1,568,000	+ 16,700
11 - 25	2112	2261	1,563,900	1,580,600	+ 16,700

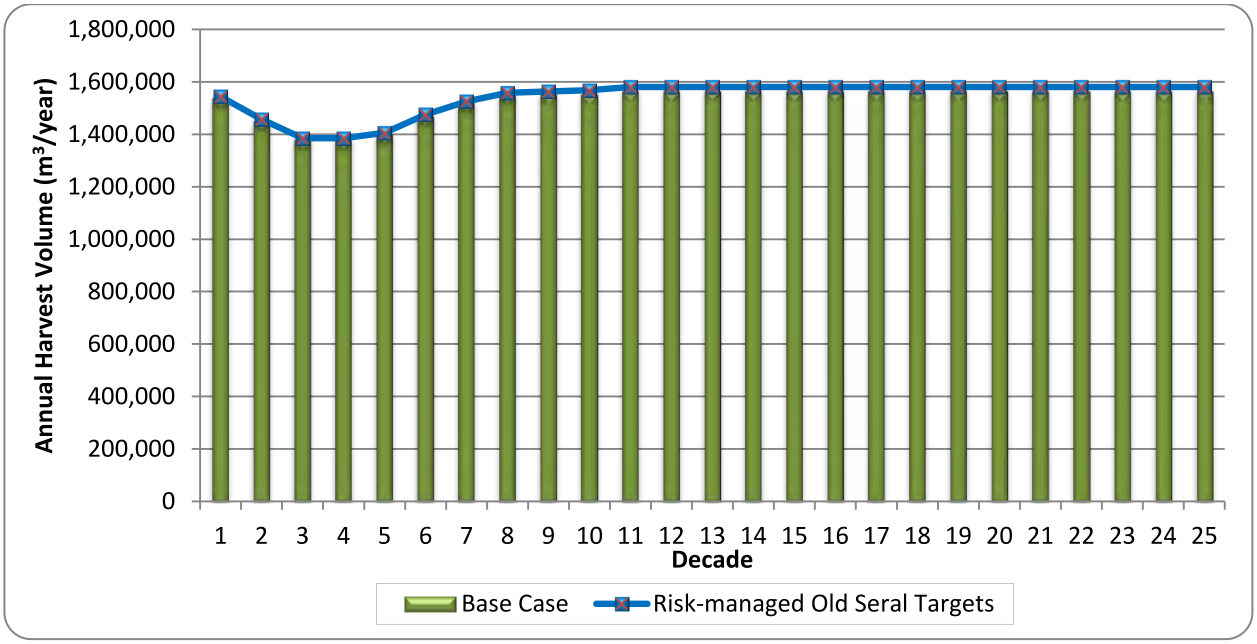

Figure 73 – Harvest levels with SCCO risk-managed old seral targets

While not a large impact at the TFL-level, this change has a significant impact to timber supply within the combined Block 3 and 5 – short-term timber supply is increased by nearly 15% and long-term by 37% (see Appendix B20 for details at the individual block level (for Block 3 and Block 5 only as the other three blocks are unaffected)).

4.19 Phillips old seral targets based on 50% RONV

The RONV targets in the SCCO vary between 30%, 50% and 70%. This analysis tests the timber supply impacts of setting old seral targets based on 50% RONV for the Phillips landscape unit (Block 5).

Table 52 and Figure 74 indicate that short and mid-term harvest levels are increased by 3,100 m^3/year (0.2%) and long-term harvest by 13,100 m3/year (0.8%). Over the 250 years, 2.45 million m^3 (0.2%) more is harvested.

Table 52 - Harvest levels with 50% RONV in Block 5

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Phillips 50% RONV	Difference
1	2012	2021	1,537,900	1,541,100	+ 3,100
2	2022	2031	1,451,500	1,454,600	+ 3,100
3 - 4	2032	2051	1,379,700	1,382,800	+ 3,100
5	2052	2061	1,399,400	1,402,500	+ 3,100
6	2062	2071	1,470,000	1,473,100	+ 3,100
7	2072	2081	1,520,000	1,523,100	+ 3,100
8	2082	2091	1,551,300	1,555,700	+ 4,400
9	2092	2101	1,551,300	1,560,700	+ 9,400
10	2102	2111	1,551,300	1,564,400	+ 13,100
11 - 25	2112	2261	1,563,900	1,577,000	+ 13,100

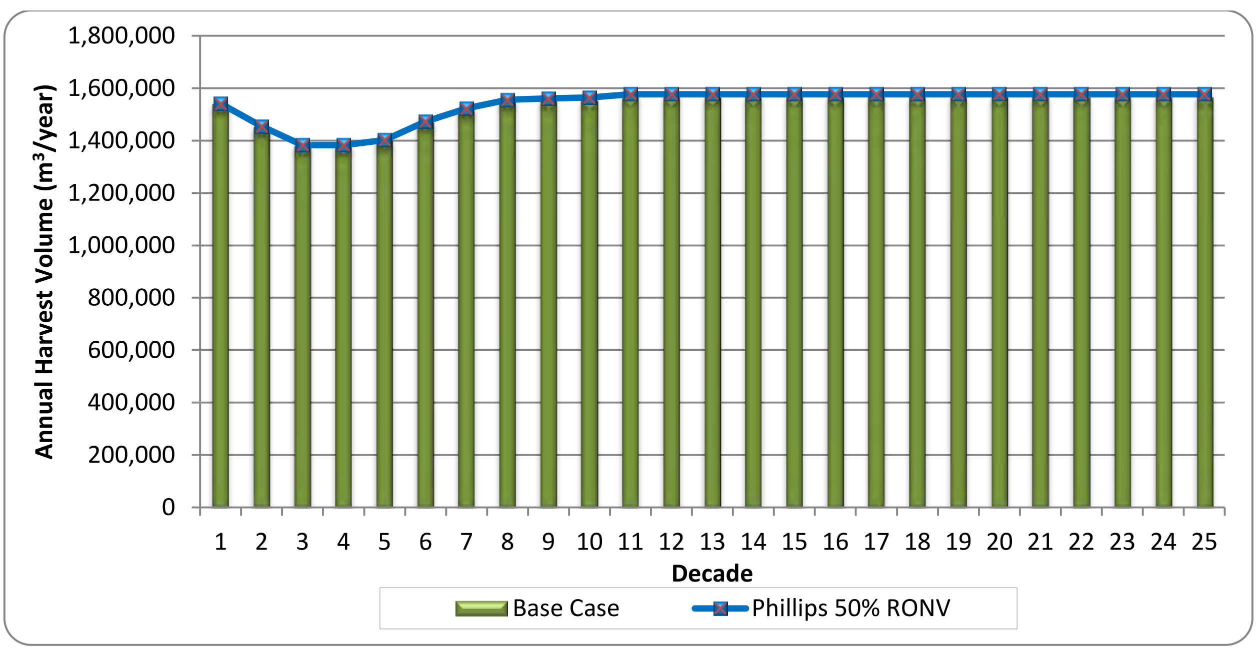

Figure 74 – Harvest levels with 50% RONV in Block 5

While not a great impact at the TFL-level, this change has a significant impact to timber supply within the combined Block 3 and 5 – short-term timber supply is increased by nearly 7.5% and long-term by 29% (see Appendix B21 for details at the individual block level (for Block 3 and Block 5 only as the other three blocks are unaffected)).

EBM targets are currently being re-negotiated and the results (expected in late 2014) may significantly change netdowns, particularly in Block 5. If warranted by amendments to the SCCO, the AAC contribution from Blocks 3 and 5 may be re-visited before the next TFL 39 AAC determination is due.

4.20 No South Central Coast Order Netdowns

To explore the timber supply impact of the SCCO and implementation of ecosystem-based management (EBM) this analysis was constructed by removing all SCCO-related netdowns (high value bear habitat, red and blue-listed ecosystems, SLRD). Stand-level retention was assumed to be similar so no changes were made to that netdown. All other assumptions in the Base Case were unaltered.

This change increases the THLB within the two blocks by a total of 4,425 ha (78%), THLB growing stock by 2,280,300 m^3 (121%) and available growing stock by 1,592,200 m^3 (124%). Table 53 and Figure 75 indicate that total TFL harvest could be increased by 1.3% throughout the planning horizon.

Table 53 - Harvest levels with no SCCO netdowns

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No SCCO	Difference
1	2012	2021	1,537,900	1,556,200	+ 18,300
2	2022	2031	1,451,500	1,469,800	+ 18,300
3 - 4	2032	2051	1,379,700	1,398,000	+ 18,300
5	2052	2061	1,399,400	1,417,700	+ 18,300
6	2062	2071	1,470,000	1,488,300	+ 18,300
7	2072	2081	1,520,000	1,538,300	+ 18,300
8	2082	2091	1,551,300	1,570,900	+ 19,600
9 - 10	2092	2111	1,551,300	1,571,500	+ 20,200
11 - 25	2112	2261	1,563,900	1,584,100	+ 20,200

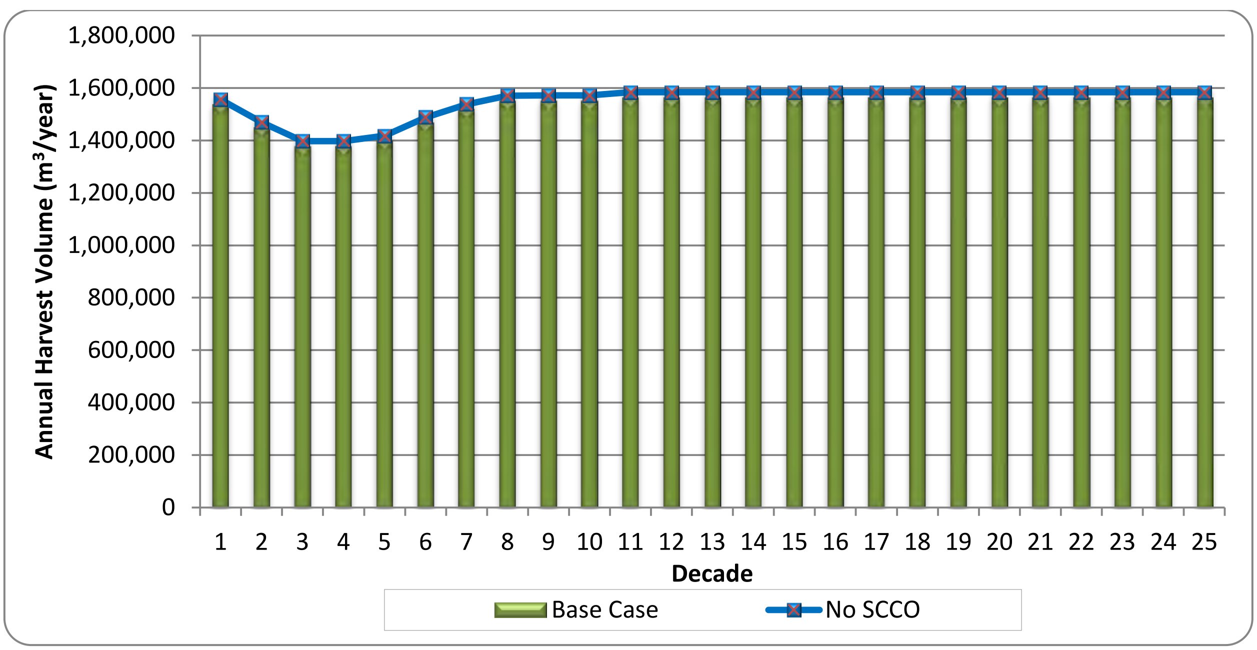

Figure 75 – Harvest levels with no SCCO netdowns

At the block level this increases the timber supply from Block 3 and 5 combined by 45% (see Appendix B22 for details at the individual block level (for Block 3 and Block 5 only as the other three blocks are unaffected).

The above results maintained the maximum 5,000 m^3/year contribution from non-conventional stands within Blocks 3 and 5. With the THLB area nearly doubling, non-conventional opportunity would likely be increased by some unknown amount. To avoid arbitrarily setting a limitation, an analysis was done that removed both the SCCO netdowns and the non-conventional restriction for comparison with the results of the analysis done with the SCCO netdowns applied but the non-conventional restriction removed (see Section 4.10).

Comparing these two scenarios (refer to Table 54 and Figure 76 below) indicates that the initial harvest level for Block 3 and 5 combined, and therefore the TFL (as the other blocks are unchanged), would be 46,700 m^3/year higher. This increase equates to 2.9% overall and 103% for Block 3/5. See Appendix B23 for details for Block 3 and 5.

Table 54 - Harvest levels with no SCCO netdowns and no non-conventional restrictions

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			No non-conventional Cap	No non-conventional Cap & No SCCO	Difference
1	2012	2021	1,595,600	1,642,300	+ 46,700
2	2022	2031	1,507,900	1,545,400	+ 37,500
3 - 5	2032	2061	1,429,100	1,465,000	+ 35,900
6	2062	2071	1,491,800	1,527,700	+ 35,900
7	2072	2081	1,557,900	1,593,800	+ 35,900
8 - 25	2082	2261	1,590,600	1,626,200	+ 35,600

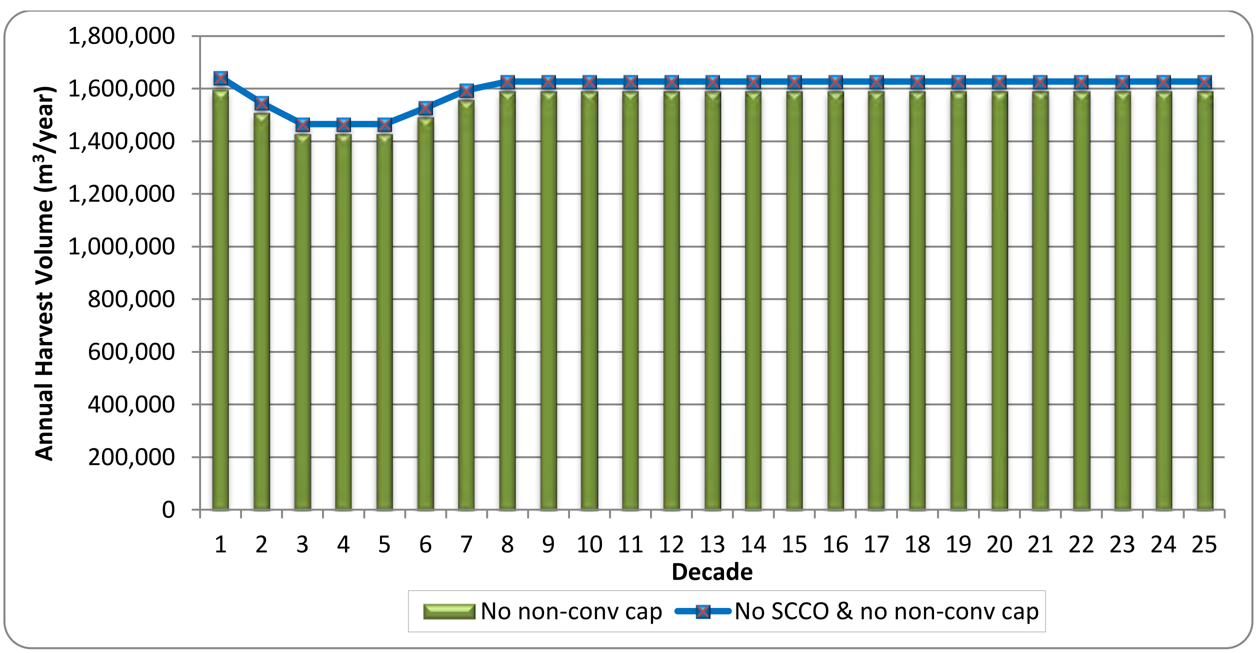

Figure 76 – Harvest levels with no SCCO netdowns and no non-conventional restrictions

4.21 Summary of sensitivity impacts

Table 55 provides a summary of the impacts of the sensitivity issues explored. Impacts shown indicate the aggregate differences over the defined time periods and are rounded to the nearest tenth of a percent. Values in parentheses refer to alternate schedules presented for the associated sensitivity analysis.

Table 55 – Summary of sensitivity analyses harvest impacts

		Harvest Interval (decades)		
		1 – 2	3 – 9	10 - 25
	Base Case total net harvest level (m^3)	29,894,000	118,027,000	234,585,000
Issue tested	**Sensitivity**	**Percentage Impact**		
Available landbase	THLB reduced by 5% (alternate: maintain initial harvest of Base Case)	- 4.5% (0.0%)	- 4.8% (- 5.3%)	- 4.7% (- 4.7%)
Growth and yield	Mature stands yields increased by 10% (alternate: maintain initial harvest of Base Case)	+ 2.4% (+ 0.9%)	+ 1.1% (+ 1.4%)	0.0% (0.0%)
	Mature stands yields decreased by 10% (alternate: maintain initial harvest of Base Case)	- 3.6% (- 0.1%)	- 0.7% (- 1.4%)	- 0.1% (- 0.2%)
	Immature stands yields increased by 10% (alternate: maintain initial harvest of Base Case)	+ 5.3% (+ 4.8%)	+9.2 % (+ 9.6%)	+ 9.6% (+ 9.6%)
	Immature stands yields decreased by 10% (alternate: maintain initial harvest of Base Case)	- 7.3% (- 0.1%)	- 8.7% (- 9.6%)	- 10.0% (-10.6%)
	Use SIBEC Site Index estimates (alternate: maintain initial harvest of Base Case)	- 0.1% (- 0.1%)	+ 3.3% (+ 2.8%)	+ 2.4% (+ 2.4%)
	Increased OAF2 for unmanaged immature (alternate: maintain initial harvest of Base Case)	- 1.5% (- 0.9%)	- 1.7% (- 1.9%)	- 1.0% (- 1.0%)
Forest management / Silviculture	No future genetic gains	0.0%	- 2.5%	- 3.2%
	Blocks 3 and 5 managed separately	- 0.2%	- 0.5%	0.0%
Operability	Increase non-conventional harvest	+ 6.8%	+ 0.4%	- 0.4%
	Remove non-conventional harvest constraint	+ 3.8%	+ 2.6%	+ 1.7%
	Exclude non-conventional landbase (alternate: maintain initial harvest of Base Case)	- 9.2% (- 2.0%)	- 8.1% (- 9.9%)	- 7.7% (- 8.2%)
Visual Management	Reduce disturbance limits	0.0%	- 0.2%	- 0.1%
Biodiversity	Remove Western Forest Strategy impacts (alternate: maintain initial harvest of Base Case)	+ 3.5% (+ 2.1%)	+ 4.0% (+ 4.3%)	+ 4.7% (+ 4.8%)
Minimum harvest criteria	Increase minimum DBH by 2cm (alternate: maintain initial harvest of Base Case)	- 2.8% (- 0.1%)	- 2.5% (- 3.0%)	- 1.5% (- 1.6%)

		Harvest Interval (decades)		
		1 – 2	3 – 9	10 - 25
	Base Case total net harvest level (m^3)	29,894,000	118,027,000	234,585,000
Issue tested	**Sensitivity**	**Percentage Impact**		
Minimum harvest criteria	Decrease minimum DBH by 2cm (alternate: maintain initial harvest of Base Case)	+ 2.4% (+ 1.7%)	+ 2.2% (+ 2.3%)	+ 0.2% (+ 0.2%)
Ecosystem Based Management	Meet landscape level biodiversity requirements aspatially	0.0%	0.1%	0.4%
	Apply risk-managed landscape level biodiversity targets	+ 0.4%	+ 0.6%	+ 1.1%
	Apply 50% RONV targets in Block 5	+ 0.2%	+ 0.4%	+ 0.8%
	No South Central Coast Order netdowns	+ 1.2%	+ 1.3%	+ 1.3%
	No South Central Coast Order netdowns or non-conventional constraint in Block 3/5 (alternate: compare to no non-conventional constraint with SCCO applied)	+ 6.6% (+ 2.7%)	+ 5.0% (+ 2.4%)	+ 4.0% (+2.3%)

5.0 Analysis Summary and Proposed AAC

5.1 Changes since MP #8

There have been considerable changes in the TFL 39 landbase and timber supply analysis assumptions since MP #8. Main changes include:

- Deletion of Block 6, multiple conservancies, BCTS, private land and small tenures areas has reduced the gross area of TFL 39 by nearly 50%. The current AAC of 1,885,980 m^3/year reflects most, but not all these area changes.
- Ecosystem Based Management has been implemented for Blocks 3 and 5.
- Landscape unit planning (OGMAs) and increased allowances for riparian areas have decreased the THLB on the remaining TFL 39.
- Smaller allowances for stand-level retention and recreation partially offset the increased netdowns for OGMAs and riparian management.
- Immature yields are based on FLNRO's TIPSY yield model rather than the proprietary model Y_XENO.
- The definition of minimum harvest ages has been changed to relate to average stand diameter and harvest system rather than age and volume.
- Harvest scheduling uses optimization compared to the simulation approach in MP #8

5.2 MP #9 Base Case Initial Harvest

The starting harvest level of 1,537,900 m^3/year in the Base Case reflects both the reduced TFL 39 landbase and the changes in management practices.

- As noted above, the current TFL 39 AAC of 1,885,980 m^3/year does not fully account for area deletions from the TFL. It still includes AAC contributions of 21,000 m^3/year associated with the former Block 7 (Namu), 10,000 m^3/year for area deleted from Block 4 to form part of a community forest, and 4,478 m^3/year for areas deleted from Block 2 for woodlots.
- The Base Case starting harvest level, an 18.5% decrease from the current AAC, also reflects the impacts of applying ecosystem-based management in Blocks 3 and 5, reduced old-growth availability due to OGMAs, restricting non-conventional contribution and different minimum harvest criteria.

5.3 Sensitivity Analyses

The initial harvest level in the Base Case is robust. The analysis indicates for most sensitivities with downward pressure on timber supply, harvest projections with initial harvest levels similar to the Base Case have little additional impact on mid-term harvest rates compared to alternative harvest schedules where the initial harvest level was allowed to be reduced. Further context for consideration of individual sensitivities includes:

- Inventory audits in the 1990s provide support for average volumes in the mature forest.
- Immature yield sensitivities include both positive (SIBEC site indexes are higher than in the Base Case) and negative views (uncertainty about older immature yields and future genetic gains). For genetic gains, WFP has been and expects to continue planting improved seedlings.
- WFP is planning to implement a harvested cutblock tracking system which will include comparisons of inventory (analysis) volume projections with estimates of harvest volumes plus waste. It is expected that this will provide a broad (forest level) check on yield assumptions.
- The non-conventional harvest system landbase is a significant component of the total. During the last 10 years harvest has occurred in these areas. This is portrayed in the Base Case. Forecast market conditions indicate further opportunities in the coming years. Refer below to the discussion on non-conventional harvest areas.
- In the past, harvest in second-growth stands was largely in older stands, especially in Block 1. More recently, harvest also has occurred in younger stands. Going forward, WFP will monitor harvested second-growth cutblocks (including age and average volume/ha) for information appropriate for comparing with and refinement of minimum harvest ages in timber supply analyses.

5.4 Non-conventional Harvest Areas

The Base Case followed the practice in other WFP TFL analyses (TFL19 [January 2009], TFL 44 [June 2010] and TFL 6 [May 2011]) of constraining harvest from non-conventional operable areas to reflect average performance of the previous 5 to 10 years. For TFL 39, the reference period of 2000 to 2010 included the severely reduced lumber markets during the unprecedented economic downturn of 2007 to 2010.

The main difference from the other recent analyses mentioned, is the current position in the lumber market cycle and the market outlook. Lumber prices have begun to recover as the housing market in the United States improves and demand in China and Japan holds steady or improves modestly. The combination of improving markets and reduced supply from the interior of BC due to the mountain pine epidemic has most market analysts forecasting lumber prices to rise dramatically. During 2012 and the first quarter of 2013, lumber prices increased substantially indicating that the lumber “super cycle” may be starting. The mid-2013 fall back in prices has largely been erased by steady price increases through the last half of 2013 and early 2014.

WFP recommends an AAC to provide opportunity to take advantage of the expected higher lumber prices - to harvest additional volume from the higher cost non-conventional land base than is incorporated in the Base Case:

Recommended TFL 39 AAC: 1,629,000 m^3/year

The recommended AAC is based on increasing the harvest contribution from non-conventional areas by 91,000 m^3/year from 131,000 m^3/year in the Base Case to the 222,000 m^3/year projected in the sensitivity analysis discussed in Section 4.9.

WFP will be establishing a spatial data set that clearly defines conventional and non-conventional operable areas and will be tracking harvested area by TFL Block and operability class. This information will be available for the next timber supply analysis.

5.5 Block 4

An application has been made to delete Block 4 from TFL 39 and to add it to neighbouring TFL 6. This reorganization of TFLs will streamline forest management and administration of the combined areas and will not compromise the level of forest management.

It is expected that this change in TFL boundaries will occur after the TFL 39 AAC Determination. The timber supply analysis by TFL Block and a specified AAC contribution for Block 4 will facilitate the process for reducing the TFL 39 AAC and increasing the TFL 6 AAC when the change occurs.

Recommended Block 4 partition of: 202,000 m^3/year

5.6 Blocks 3 and 5

A specified AAC partition is recommended for Blocks 3 and 5, subject to the South Central Coast Order including Ecosystem Based Management (EBM). EBM targets are currently being re-negotiated and the results (expected in late 2014) may significantly change netdowns, particularly in Block 5. A specified AAC contribution for Blocks 3 & 5 facilitates changing the AAC contribution from Blocks 3 & 5 if warranted.

Recommended Blocks 3 & 5 partition of: 45,000 m^3/year

5.7 Summary of Recommendations

A TFL 39 AAC of 1,629,000 m^3/year is recommended. This includes 1,831 m^3/year allocated to First Nations in the Campbell River Resource District.

The proposed AAC is 13.5% less than the current AAC of 1,885,980 m^3/year.

The recommendation is 91,100 m^3/year higher than the initial harvest of 1,537,900 m^3/year in the Base Case to provide additional opportunities for harvesting higher cost non-conventional operable areas in the strong markets forecast for the coming years.

To recognize special circumstances for Blocks 3&5 and Block 4 (discussed above) it is recommended that the TFL 39 AAC be specified as follows:

Total AAC: 1,629,000 m^3/year, including the following partitions:

Block 4:	202,000 m^3/year
Blocks 3&5:	45,000 m^3/year

Appendix A: Detailed Base Case Harvest Schedule Statistics

Appendix A1 – Additional Base Case Statistics for Block 1

The following tables provide average annual values (per decade) for the Base Case harvest schedule for Block 1.

Table 56 – Block 1 Base Case Average Annual Statistics by Harvest System

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	176,577	130	814	208,730	160	758	50,000	112	939	435,306	142	798
2	2022	2031	67,886	136	800	317,423	137	892	50,000	185	794	435,309	142	865
3	2032	2041	237,452	109	818	147,858	123	767	50,000	307	696	435,310	136	784
4	2042	2051	176,136	102	771	209,174	104	754	50,000	160	874	435,310	110	773
5	2052	2061	220,582	84	574	164,728	147	776	50,000	285	777	435,310	131	659
6	2062	2071	187,938	79	656	197,372	105	837	50,000	228	840	435,310	108	748
7	2072	2081	153,911	106	823	231,399	114	844	50,000	242	826	435,311	126	834
8	2082	2091	47,509	84	717	337,801	84	751	50,000	248	812	435,310	103	754
9	2092	2101	113,762	71	648	271,549	89	788	50,000	231	784	435,311	101	746
10	2102	2111	218,928	83	706	166,383	100	847	50,000	220	804	435,310	105	765
11	2112	2121	306,084	72	669	79,227	96	862	50,000	167	939	435,310	87	722
12	2122	2131	207,497	71	643	177,813	100	807	50,000	209	894	435,310	99	727
13	2132	2141	159,969	70	637	225,341	96	862	50,000	180	941	435,310	96	769
14	2142	2151	147,192	57	492	238,119	76	757	50,000	147	999	435,311	78	656
15	2152	2161	52,115	65	661	333,196	79	764	50,000	159	963	435,311	86	768
16	2162	2171	49,712	97	743	335,599	99	781	50,000	167	970	435,310	106	794
17	2172	2181	245,288	67	661	140,023	116	768	50,000	153	987	435,311	93	721
18	2182	2191	186,064	73	632	199,247	102	815	50,000	164	1,003	435,311	97	739
19	2192	2201	216,461	74	672	168,850	97	804	50,000	161	1,064	435,311	93	752
20	2202	2211	226,892	70	672	158,419	81	769	50,000	164	1,029	435,311	85	735
21	2212	2221	102,237	68	606	283,075	75	742	50,000	174	1,168	435,311	85	734
22	2222	2231	39,020	66	652	346,290	86	803	50,000	157	1,044	435,310	93	808
23	2232	2241	233,048	65	658	152,263	85	765	50,000	167	1,144	435,311	84	729
24	2242	2251	118,690	82	708	266,620	94	798	50,000	181	1,158	435,311	101	799
25	2252	2261	226,305	72	627	159,006	86	796	50,000	168	1,113	435,310	88	719
Average			164,690	81	670	220,620	100	793	50,000	189	925	435,310	103	753

Table 57 – Block 1 Base Case Average Annual Statistics by Harvest System for Natural[4] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting: Harvest Volume (m³)	Ground-based Harvesting: Average Harvest Age (years)	Ground-based Harvesting: Average Harvest Volume per Ha (m³/ha)	Cable Harvesting: Harvest Volume (m³)	Cable Harvesting: Average Harvest Age (years)	Cable Harvesting: Average Harvest Volume per Ha (m³/ha)	Non-conventional Harvesting: Harvest Volume (m³)	Non-conventional Harvesting: Average Harvest Age (years)	Non-conventional Harvesting: Average Harvest Volume per Ha (m³/ha)	Total: Harvest Volume (m³)	Total: Average Harvest Age (years)	Total: Average Harvest Volume per Ha (m³/ha)
1	2012	2021	176,577	130	814	208,730	160	758	50,000	112	939	435,306	142	798
2	2022	2031	67,875	136	800	317,423	137	892	50,000	185	794	435,298	142	865
3	2032	2041	227,000	110	830	138,096	126	777	50,000	307	696	415,096	139	793
4	2042	2051	115,488	113	813	146,849	112	761	50,000	160	874	312,337	120	796
5	2052	2061	37,082	162	727	95,276	188	772	49,942	285	776	182,300	209	764
6	2062	2071	21,295	137	840	42,364	147	842	50,000	228	840	113,659	181	841
7	2072	2081	38,894	172	941	38,228	214	904	49,874	243	825	126,996	212	881
8	2082	2091	4,222	185	976	3,403	234	867	49,511	249	810	57,135	244	824
9	2092	2101	180	150	1,048	1,130	194	945	38,929	271	768	40,240	268	773
10	2102	2111	523	156	1,192	4,352	178	882	35,063	273	769	39,938	261	783
11	2112	2121	395	195	348	165	200	844	27,529	217	952	28,089	216	928
12	2122	2131	0	-	-	13,975	178	896	32,059	263	867	46,034	237	876
13	2132	2141	2	195	348	130	195	348	21,929	261	868	22,061	261	860
14	2142	2151	0	-	-	0	-	-	10,925	247	1,007	10,925	247	1,007
15	2152	2161	0	-	-	0	-	-	12,675	250	804	12,675	250	804
16	2162	2171	5,824	246	1,172	18,568	246	951	11,745	271	770	36,138	254	909
17	2172	2181	1,980	261	911	3,023	258	1,028	7,992	283	894	12,995	274	925
18	2182	2191	243	284	774	0	-	-	10,257	286	999	10,500	286	992
19	2192	2201	0	-	-	0	-	-	7,279	302	966	7,279	302	966
20	2202	2211	0	-	-	0	-	-	6,402	309	803	6,402	309	803
21	2212	2221	0	-	-	0	-	-	5,148	312	1,268	5,148	312	1,268
22	2222	2231	0	-	-	0	-	-	4,142	314	989	4,142	314	989
23	2232	2241	0	-	-	0	-	-	3,944	328	1,147	3,944	328	1,147
24	2242	2251	0	-	-	0	-	-	2,382	330	867	2,382	330	867
25	2252	2261	0	-	-	0	-	-	1,407	323	757	1,407	323	757
Average			27,903	127	822	41,268	148	815	25,565	238	829	94,737	166	821

[4] Natural Stands are all stands established before 1962.

Table 58 – Block 1 Base Case Average Annual Statistics by Harvest System for Managed[5] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	0	-	-	0	-	-	0	-	-	0	-	-
2	2022	2031	11	65	377	0	-	-	0	-	-	11	65	377
3	2032	2041	10,451	74	622	9,762	75	657	0	-	-	20,214	74	639
4	2042	2051	60,648	81	703	62,325	85	738	0	-	-	122,973	83	721
5	2052	2061	183,499	68	551	69,452	90	782	0	90	909	253,010	74	600
6	2062	2071	166,643	72	638	155,008	94	836	58	-	-	321,651	83	720
7	2072	2081	115,018	83	789	193,171	94	833	0	90	1,080	308,315	90	816
8	2082	2091	43,288	74	699	334,398	82	750	126	99	1,029	378,175	81	744
9	2092	2101	113,581	71	648	270,419	89	787	489	91	844	395,071	84	743
10	2102	2111	218,405	83	705	162,031	98	846	11,071	95	899	395,373	89	763
11	2112	2121	305,688	72	670	79,062	96	862	14,937	107	924	407,222	78	711
12	2122	2131	207,497	71	643	163,837	93	801	22,471	111	947	389,276	82	712
13	2132	2141	159,967	70	637	225,211	96	863	17,941	116	1,007	413,249	88	765
14	2142	2151	147,192	57	492	238,119	76	757	28,071	119	996	424,386	73	650
15	2152	2161	52,115	65	661	333,196	79	764	39,075	129	1,032	422,635	82	767
16	2162	2171	43,888	78	709	317,031	90	773	37,325	135	1,054	399,173	93	785
17	2172	2181	243,308	66	660	137,000	113	763	38,254	129	1,007	422,316	87	716
18	2182	2191	185,821	73	632	199,247	102	815	42,008	132	1,004	424,811	92	735
19	2192	2201	216,461	74	672	168,850	97	804	39,743	137	1,082	428,032	89	749
20	2202	2211	226,892	70	672	158,419	81	769	42,721	143	1,073	428,909	81	734
21	2212	2221	102,237	68	606	283,075	75	742	43,598	158	1,157	430,163	82	731
22	2222	2231	39,020	66	652	346,290	86	803	44,852	143	1,049	431,168	91	806
23	2232	2241	233,048	65	658	152,263	85	765	45,858	153	1,144	431,367	81	727
24	2242	2251	118,690	82	708	266,620	94	798	46,056	174	1,178	432,929	100	798
25	2252	2261	226,305	72	627	159,006	86	796	47,618	164	1,128	433,904	88	719
Average			136,787	71	646	179,352	89	788	48,593	138	1,052	340,573	95	736

[5] Managed Stands are all stands established since 1962.

Table 59 – Block 1 Base Case Average Annual Contributions of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Natural Stands				Managed Stands				Total			
			Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)	Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)	Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)
1	2012	2021	435,306	109,547	16,264	46,633	0	0	0	0	435,306	109,547	16,264	46,633
2	2022	2031	435,298	127,729	25,257	55,133	11	2	0	2	435,309	127,732	25,257	55,135
3	2032	2041	415,096	126,234	17,876	61,223	20,214	2,310	357	1,828	435,310	128,544	18,233	63,051
4	2042	2051	312,337	125,373	32,044	45,953	122,973	26,776	9,275	8,974	435,310	152,149	41,319	54,927
5	2052	2061	182,300	71,844	23,206	25,977	253,010	62,289	23,269	28,052	435,310	134,133	46,475	54,030
6	2062	2071	113,659	46,523	14,403	19,200	321,651	100,819	60,184	41,033	435,310	147,342	74,587	60,234
7	2072	2081	126,996	41,676	11,750	17,105	308,315	90,660	35,112	54,064	435,311	132,335	46,862	71,168
8	2082	2091	57,135	22,798	9,316	8,046	378,175	50,809	34,012	65,225	435,310	73,607	43,328	73,271
9	2092	2101	40,240	16,194	7,278	6,531	395,071	60,815	35,169	62,614	435,311	77,009	42,447	69,144
10	2102	2111	39,938	15,585	6,563	4,257	395,373	87,204	34,987	69,012	435,310	102,789	41,551	73,268
11	2112	2121	28,089	9,438	1,203	3,652	407,222	77,591	27,816	67,699	435,310	87,029	29,020	71,351
12	2122	2131	46,034	18,596	6,708	5,202	389,276	119,421	34,388	58,308	435,310	138,017	41,096	63,510
13	2132	2141	22,061	7,068	1,869	2,950	413,249	169,893	40,702	58,686	435,310	176,961	42,571	61,636
14	2142	2151	10,925	3,994	538	1,852	424,386	62,319	13,004	74,244	435,311	66,313	13,543	76,096
15	2152	2161	12,675	4,624	834	2,141	422,635	85,446	20,268	71,641	435,311	90,070	21,102	73,782
16	2162	2171	36,138	9,520	964	5,015	399,173	119,449	29,284	61,778	435,310	128,969	30,247	66,793
17	2172	2181	12,995	3,654	810	1,437	422,316	51,309	17,975	67,326	435,311	54,963	18,785	68,763
18	2182	2191	10,500	3,159	732	961	424,811	145,211	41,860	55,524	435,311	148,370	42,593	56,485
19	2192	2201	7,279	2,885	488	1,327	428,032	151,108	36,742	62,419	435,311	153,992	37,231	63,746
20	2202	2211	6,402	1,962	815	594	428,909	109,549	25,530	67,524	435,311	111,511	26,345	68,117
21	2212	2221	5,148	2,201	554	862	430,163	54,075	14,842	75,050	435,311	56,277	15,396	75,912
22	2222	2231	4,142	1,725	489	586	431,168	146,262	34,344	65,272	435,310	147,987	34,833	65,858
23	2232	2241	3,944	1,308	349	475	431,367	63,768	20,801	71,785	435,311	65,077	21,150	72,260
24	2242	2251	2,382	579	29	236	432,929	157,344	39,817	61,996	435,311	157,923	39,846	62,232
25	2252	2261	1,407	637	160	305	433,904	138,582	30,544	64,763	435,310	139,219	30,704	65,069
Average			94,737	30,994	7,220	12,706	340,573	85,321	26,411	52,593	435,310	116,315	33,631	65,299

Table 60 – Block 1 Base Case Average Ages and Yields of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Hemlock			Balsam			Cedar		
			Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[6]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[6]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[6]
1	2012	2021	109,547	164	806	16,264	255	777	46,633	158	806
2	2022	2031	127,732	160	873	25,257	271	853	55,135	143	868
3	2032	2041	128,544	149	792	18,233	231	781	63,051	147	789
4	2042	2051	152,149	113	781	41,319	107	765	54,927	116	777
5	2052	2061	134,133	155	666	46,475	198	657	54,030	134	665
6	2062	2071	147,342	121	813	74,587	122	806	60,234	105	813
7	2072	2081	132,335	140	878	46,862	147	873	71,168	122	877
8	2082	2091	73,607	146	826	43,328	146	818	73,271	97	826
9	2092	2101	77,009	141	902	42,447	142	901	69,144	98	902
10	2102	2111	102,789	132	896	41,551	144	891	73,268	98	896
11	2112	2121	87,029	108	851	29,020	113	849	71,351	82	850
12	2122	2131	138,017	109	785	41,096	125	778	63,510	93	785
13	2132	2141	176,961	99	811	42,571	105	799	61,636	95	810
14	2142	2151	66,313	102	896	13,543	99	896	76,096	76	896
15	2152	2161	90,070	107	890	21,102	111	890	73,782	84	890
16	2162	2171	128,969	114	910	30,247	115	882	66,793	102	907
17	2172	2181	54,963	132	926	18,785	129	912	68,763	84	907
18	2182	2191	148,370	101	824	42,593	106	823	56,485	90	819
19	2192	2201	153,992	98	812	37,231	100	811	63,746	91	811
20	2202	2211	111,511	96	839	26,345	104	828	68,117	80	839
21	2212	2221	56,277	121	977	15,396	124	975	75,912	82	975
22	2222	2231	147,987	103	886	34,833	108	886	65,858	89	886
23	2232	2241	65,077	118	955	21,150	121	955	72,260	78	955
24	2242	2251	157,923	112	885	39,846	120	882	62,232	94	875
25	2252	2261	139,219	98	819	30,704	105	819	65,069	86	819
Average			116,315	120	829	33,631	134	819	65,299	99	827

[6] Average volume per hectare indicates the average stand volume when the respective species is found within the stand. For example, in Decade #1 the average volume for harvested stands containing hemlock was 806 m^3/ha.

Appendix A2 – Additional Base Case Statistics for Block 2

The following tables provide average annual values per decade for the Base Case harvest schedule for Block 2.

Table 61 – Block 2 Base Case Average Annual Statistics by Harvest System

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	397,067	208	612	427,222	263	687	40,000	295	617	864,289	239	647
2	2022	2031	550,144	198	693	187,724	245	683	40,000	295	715	777,868	214	691
3	2032	2041	480,252	79	686	185,798	225	760	40,000	316	682	706,050	131	704
4	2042	2051	460,045	100	734	206,004	96	800	40,000	337	688	706,049	112	749
5	2052	2061	411,981	104	742	265,187	116	807	28,882	287	765	706,050	116	766
6	2062	2071	416,451	95	709	299,598	100	839	40,000	254	771	756,049	106	759
7	2072	2081	571,252	90	711	194,793	105	871	40,000	293	710	806,045	104	744
8	2082	2091	482,619	76	645	311,087	99	859	40,000	303	704	833,706	95	714
9	2092	2101	637,874	75	705	155,831	91	907	40,000	313	717	833,705	90	737
10	2102	2111	400,266	86	696	393,439	101	882	40,000	241	865	833,704	101	781
11	2112	2121	394,077	81	743	399,631	102	873	40,000	123	1,147	833,708	93	815
12	2122	2131	541,376	84	678	252,331	98	830	40,000	134	1,098	833,707	91	732
13	2132	2141	513,072	74	653	280,635	98	867	40,000	125	1,083	833,706	84	727
14	2142	2151	591,982	71	624	201,722	95	837	40,000	127	1,079	833,704	79	680
15	2152	2161	507,558	75	750	286,150	91	894	40,000	127	1,070	833,708	83	807
16	2162	2171	211,753	110	774	581,954	127	870	40,000	137	1,069	833,706	123	851
17	2172	2181	470,469	88	705	323,234	110	869	40,000	138	1,068	833,703	99	774
18	2182	2191	589,371	80	626	204,335	94	884	40,000	134	1,072	833,706	86	689
19	2192	2201	575,442	80	702	218,263	92	871	40,000	144	1,087	833,705	86	753
20	2202	2211	279,414	76	730	514,292	94	863	40,000	134	1,075	833,705	90	821
21	2212	2221	656,472	73	694	137,237	94	841	40,000	141	1,123	833,709	80	729
22	2222	2231	471,284	77	781	322,421	94	876	40,000	157	1,111	833,706	87	828
23	2232	2241	535,034	71	661	258,673	91	855	40,000	168	1,098	833,707	82	726
24	2242	2251	459,411	95	691	334,295	101	852	40,000	151	1,086	833,706	100	762
25	2252	2261	471,475	78	608	322,223	98	865	40,000	146	1,089	833,697	89	704
Average			483,046	92	687	290,563	118	839	39,555	200	905	813,164	106	744

Table 62 – Block 2 Base Case Average Annual Statistics by Harvest System for Natural[7] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	395,539	209	612	427,215	263	687	40,000	295	617	862,754	239	647
2	2022	2031	463,600	222	690	165,950	269	675	40,000	295	715	669,550	238	688
3	2032	2041	153,136	97	649	138,883	277	749	40,000	316	682	332,019	199	692
4	2042	2051	133,944	153	714	77,311	121	773	40,000	337	688	251,254	172	726
5	2052	2061	58,185	254	686	92,082	171	757	28,725	288	765	178,992	217	733
6	2062	2071	45,536	209	740	30,297	194	746	38,367	261	763	114,200	222	749
7	2072	2081	57,219	195	997	18,286	237	874	40,000	293	710	115,505	236	858
8	2082	2091	12,077	222	909	9,785	295	766	40,000	303	704	61,862	286	746
9	2092	2101	274	154	1,276	35	150	844	40,000	313	717	40,310	312	719
10	2102	2111	1,057	176	1,098	2,455	152	846	30,092	273	802	33,604	261	812
11	2112	2121	638	165	1,186	0	-	-	4,786	236	907	5,424	227	933
12	2122	2131	1,103	316	760	103	345	764	5,612	200	931	6,818	221	895
13	2132	2141	1,501	317	576	946	321	690	0	-	-	2,447	319	615
14	2142	2151	3,339	245	415	1,333	291	595	0	-	-	4,672	258	454
15	2152	2161	10,188	236	387	605	216	349	0	-	-	10,793	234	385
16	2162	2171	35,839	223	897	1,664	276	576	48	310	598	37,551	226	875
17	2172	2181	24,763	269	1,192	15,339	264	1,219	0	-	-	40,102	267	1,202
18	2182	2191	2,217	319	637	588	323	415	153	265	1,132	2,957	317	588
19	2192	2201	1,417	307	703	1,598	307	796	24	240	362	3,039	307	743
20	2202	2211	637	347	623	443	349	630	979	295	755	2,059	323	681
21	2212	2221	712	338	475	24	326	751	39	310	760	775	336	490
22	2222	2231	75	303	673	2	295	636	0	-	-	77	302	672
23	2232	2241	37	325	620	7	347	525	61	330	530	105	329	558
24	2242	2251	61	329	537	16	333	454	0	-	-	78	330	517
25	2252	2261	39	325	636	0	-	-	38	342	639	77	333	637
Average			56,125	200	678	39,399	244	715	15,557	296	714	111,081	229	696

[7] Natural Stands are all stands established before 1962.

Table 63 – Block 2 Base Case Average Annual Statistics by Harvest System for Managed[8] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	1,544	60	531	0	-	-	0	-	-	1,544	60	531
2	2022	2031	86,543	66	707	21,774	65	753	0	-	-	108,317	66	715
3	2032	2041	327,116	70	705	46,914	69	794	0	-	-	374,030	70	715
4	2042	2051	326,101	79	743	128,694	81	817	0	-	-	454,795	79	763
5	2052	2061	353,797	79	752	173,104	87	837	158	90	936	527,059	82	778
6	2062	2071	370,915	81	705	269,302	90	851	1,633	105	1,006	641,849	85	761
7	2072	2081	514,033	78	689	176,506	92	870	0	-	-	690,540	81	728
8	2082	2091	470,542	72	640	301,302	93	862	0	-	-	771,844	80	712
9	2092	2101	637,599	75	705	155,795	91	907	0	-	-	793,395	78	738
10	2102	2111	399,209	86	695	390,983	101	882	9,908	143	1,132	800,100	94	780
11	2112	2121	393,439	81	743	399,631	102	873	35,214	108	1,189	828,284	92	814
12	2122	2131	540,273	84	678	252,228	98	830	34,388	123	1,131	826,889	90	731
13	2132	2141	511,571	73	654	279,689	97	867	40,000	125	1,083	831,259	84	728
14	2142	2151	588,643	70	626	200,389	93	839	40,000	127	1,079	829,033	78	681
15	2152	2161	497,370	72	765	285,545	90	897	40,000	127	1,070	822,915	81	818
16	2162	2171	175,914	88	753	580,289	127	871	39,952	137	1,070	796,155	119	850
17	2172	2181	445,706	78	689	307,895	102	856	40,000	138	1,068	793,601	90	760
18	2182	2191	587,154	79	626	203,747	94	887	39,847	133	1,072	830,749	86	689
19	2192	2201	574,025	80	702	216,665	91	872	39,976	144	1,088	830,666	86	753
20	2202	2211	278,776	75	731	513,849	94	863	39,021	130	1,087	831,647	89	821
21	2212	2221	655,760	73	695	137,213	94	841	39,961	141	1,123	832,934	80	729
22	2222	2231	471,209	77	781	322,420	94	876	40,000	157	1,111	833,629	87	828
23	2232	2241	534,998	71	661	258,666	91	855	39,939	168	1,100	833,602	82	726
24	2242	2251	459,350	95	691	334,279	101	853	40,000	151	1,086	833,629	100	762
25	2252	2261	471,436	78	608	322,223	98	865	39,961	146	1,089	833,620	89	704
Average			426,921	77	689	251,164	98	863	23,998	137	1,095	702,083	87	753

[8] Managed Stands are all stands established since 1962.

Table 64 – Block 2 Base Case Average Annual Contributions of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Natural Stands				Managed Stands				Total			
			Harvest Volume (m³)	Hemlock Harvest Volume (m³)	Balsam Harvest Volume (m³)	Cedar Harvest Volume (m³)	Harvest Volume (m³)	Hemlock Harvest Volume (m³)	Balsam Harvest Volume (m³)	Cedar Harvest Volume (m³)	Harvest Volume (m³)	Hemlock Harvest Volume (m³)	Balsam Harvest Volume (m³)	Cedar Harvest Volume (m³)
1	2012	2021	862,754	403,412	166,359	50,026	1,544	761	43	31	864,289	404,172	166,403	50,057
2	2022	2031	669,550	337,173	159,374	30,308	108,317	40,867	3,238	3,248	777,868	378,040	162,612	33,556
3	2032	2041	332,019	167,857	83,797	12,280	374,030	207,230	35,725	21,998	706,050	375,086	119,522	34,278
4	2042	2051	251,254	135,029	82,331	7,376	454,795	243,059	36,145	14,777	706,049	378,088	118,477	22,153
5	2052	2061	178,992	88,854	42,470	10,611	527,059	301,658	69,926	28,002	706,050	390,512	112,396	38,613
6	2062	2071	114,200	57,661	36,088	4,488	641,849	366,621	102,800	31,414	756,049	424,282	138,888	35,901
7	2072	2081	115,505	54,017	26,247	6,225	690,540	330,129	107,902	27,284	806,045	384,145	134,148	33,510
8	2082	2091	61,862	29,220	18,403	2,166	771,844	339,911	108,869	23,585	833,706	369,130	127,272	25,751
9	2092	2101	40,310	19,262	13,349	1,211	793,395	480,650	85,546	37,377	833,705	499,912	98,896	38,588
10	2102	2111	33,604	15,671	12,120	943	800,100	524,288	137,170	36,941	833,704	539,959	149,290	37,884
11	2112	2121	5,424	2,556	2,161	97	828,284	571,390	133,457	47,741	833,708	573,946	135,618	47,838
12	2122	2131	6,818	3,548	2,210	472	826,889	482,429	129,586	38,833	833,707	485,977	131,796	39,304
13	2132	2141	2,447	1,018	670	198	831,259	455,819	87,159	35,005	833,706	456,837	87,829	35,202
14	2142	2151	4,672	1,346	739	120	829,033	377,238	64,730	27,219	833,704	378,584	65,469	27,339
15	2152	2161	10,793	2,183	631	294	822,915	531,014	73,965	34,085	833,708	533,198	74,596	34,379
16	2162	2171	37,551	17,543	5,884	1,541	796,155	478,643	148,714	32,670	833,706	496,186	154,598	34,211
17	2172	2181	40,102	17,800	1,552	2,220	793,601	502,387	96,918	34,300	833,703	520,187	98,470	36,520
18	2182	2191	2,957	1,252	263	455	830,749	527,982	94,198	33,678	833,706	529,233	94,461	34,134
19	2192	2201	3,039	1,196	109	470	830,666	602,412	107,806	41,682	833,705	603,609	107,915	42,152
20	2202	2211	2,059	858	450	311	831,647	520,239	90,602	32,942	833,705	521,097	91,052	33,253
21	2212	2221	775	324	121	243	832,934	314,792	59,625	19,372	833,709	315,117	59,746	19,616
22	2222	2231	77	30	18	25	833,629	580,417	106,771	36,394	833,706	580,447	106,789	36,419
23	2232	2241	105	29	9	19	833,602	428,291	74,784	26,604	833,707	428,320	74,793	26,622
24	2242	2251	78	31	8	28	833,629	598,260	107,362	36,662	833,706	598,291	107,369	36,691
25	2252	2261	77	30	13	29	833,620	577,010	117,113	41,276	833,697	577,040	117,126	41,305
Average			111,570	54,316	26,215	5,286	702,083	415,340	87,206	29,725	813,653	469,656	113,421	35,011

Table 65 – Block 2 Base Case Average Ages and Yields of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Hemlock			Balsam			Cedar		
			Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[9]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[9]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[9]
1	2012	2021	404,172	242	654	166,403	261	656	50,057	261	650
2	2022	2031	378,040	214	698	162,612	282	703	33,556	218	699
3	2032	2041	375,086	124	711	119,522	202	726	34,278	107	714
4	2042	2051	378,088	110	757	118,477	139	759	22,153	126	761
5	2052	2061	390,512	111	774	112,396	141	783	38,613	130	776
6	2062	2071	424,282	104	767	138,888	126	785	35,901	106	772
7	2072	2081	384,145	108	752	134,148	125	783	33,510	118	769
8	2082	2091	369,130	100	721	127,272	122	788	25,751	101	788
9	2092	2101	499,912	89	744	98,896	115	783	38,588	91	785
10	2102	2111	539,959	98	789	149,290	114	810	37,884	98	813
11	2112	2121	573,946	90	823	135,618	102	826	47,838	96	830
12	2122	2131	485,977	89	739	131,796	101	763	39,304	96	747
13	2132	2141	456,837	88	735	87,829	94	748	35,202	93	748
14	2142	2151	378,584	85	686	65,469	91	788	27,339	91	783
15	2152	2161	533,198	83	815	74,596	89	877	34,379	86	860
16	2162	2171	496,186	119	860	154,598	137	894	34,211	126	874
17	2172	2181	520,187	99	782	98,470	103	841	36,520	105	826
18	2182	2191	529,233	90	696	94,461	93	777	34,134	92	746
19	2192	2201	603,609	86	761	107,915	88	763	42,152	87	766
20	2202	2211	521,097	91	829	91,052	98	871	33,253	94	867
21	2212	2221	315,117	86	736	59,746	98	849	19,616	89	837
22	2222	2231	580,447	87	836	106,789	96	856	36,419	86	847
23	2232	2241	428,320	88	733	74,793	102	832	26,622	88	821
24	2242	2251	598,291	100	770	107,369	103	791	36,691	98	776
25	2252	2261	577,040	90	711	117,126	89	717	41,305	88	718
Average			469,656	104	752	113,421	133	784	35,011	113	777

[9] Average volume per hectare indicates the average stand volume when the respective species is found within the stand For example, in Decade #1 the average volume for harvested stands containing hemlock was 654 m^3/ha.

Appendix A3 – Additional Base Case Statistics for Block 4

The following tables provide average annual values per decade for the Base Case harvest schedule for Block 4.

Table 66 – Block 4 Base Case Average Annual Statistics by Harvest System

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	80,022	178	769	80,934	251	715	36,000	301	651	196,956	231	723
2	2022	2031	97,534	108	719	63,423	258	820	36,000	311	709	196,957	194	747
3	2032	2041	111,437	82	667	49,523	118	794	36,000	324	787	196,960	135	716
4	2042	2051	143,370	82	721	17,589	98	786	36,000	329	805	196,959	129	741
5	2052	2061	68,202	101	725	115,209	115	877	33,245	340	854	216,656	145	820
6	2062	2071	105,374	100	861	128,063	99	762	3,908	285	784	237,345	102	616
7	2072	2081	112,201	113	1,056	124,856	104	870	289	316	656	237,345	108	949
8	2082	2091	89,606	95	1,000	147,181	102	888	558	302	567	237,345	100	926
9	2092	2101	181,197	89	1,014	55,706	89	955	442	106	1,136	237,345	89	1,000
10	2102	2111	164,324	87	840	65,175	99	924	7,846	118	848	237,345	91	862
11	2112	2121	176,201	86	779	67,442	106	877	6,234	124	607	249,878	92	798
12	2122	2131	92,694	88	830	121,192	107	845	35,991	115	1,063	249,877	101	865
13	2132	2141	156,636	81	754	75,204	93	687	18,039	119	1,080	249,878	88	597
14	2142	2151	118,113	74	770	131,764	92	861	0	-	-	249,878	84	816
15	2152	2161	123,484	68	842	126,394	87	866	0	-	-	249,878	77	854
16	2162	2171	52,919	75	773	160,959	114	857	36,000	159	1,064	249,878	112	861
17	2172	2181	168,181	76	704	45,697	101	831	36,000	146	1,011	249,878	90	759
18	2182	2191	147,392	74	680	66,487	107	814	36,000	149	980	249,878	93	746
19	2192	2201	89,499	70	664	124,378	99	835	36,000	151	1,010	249,877	96	782
20	2202	2211	159,879	74	650	53,999	88	861	36,000	175	1,069	249,878	91	730
21	2212	2221	156,068	67	767	57,811	80	664	36,000	173	1,070	249,878	86	611
22	2222	2231	66,840	65	727	158,472	95	849	24,565	183	981	249,877	96	823
23	2232	2241	48,231	62	649	165,647	96	848	36,000	128	1,042	249,878	94	821
24	2242	2251	142,760	75	656	82,480	93	849	24,638	123	1,073	249,878	85	740
25	2252	2261	129,216	77	679	101,343	93	845	19,318	278	737	249,877	99	743
Average			119,255	85	761	95,477	109	833	22,843	207	642	237,575	106	774

Table 67 – Block 4 Base Case Average Annual Statistics by Harvest System for Natural[10] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	79,135	180	771	80,934	251	715	36,000	301	651	196,069	231	723
2	2022	2031	69,202	128	773	63,391	259	820	36,000	311	709	168,592	216	775
3	2032	2041	30,281	102	617	21,123	176	829	36,000	324	787	87,403	212	727
4	2042	2051	40,952	98	837	9,120	115	771	35,755	330	803	85,827	197	815
5	2052	2061	5,420	348	717	42,936	155	847	32,377	345	847	80,733	244	837
6	2062	2071	4,337	213	755	4,028	252	738	3,908	285	784	12,273	249	758
7	2072	2081	26,772	151	1,364	4,784	207	1,066	289	316	656	31,845	161	1,297
8	2082	2091	3,941	179	1,089	1,853	282	873	460	330	735	6,255	221	982
9	2092	2101	0	-	-	0	-	-	0	-	-	0	-	-
10	2102	2111	61	143	963	1,919	167	887	137	152	1,190	2,117	165	904
11	2112	2121	2	215	1,595	0	-	-	0	-	-	2	215	1,595
12	2122	2131	14	215	1,384	0	-	-	0	-	-	14	215	1,384
13	2132	2141	0	-	-	0	-	-	0	-	-	0	-	-
14	2142	2151	0	-	-	0	-	-	0	-	-	0	-	-
15	2152	2161	0	-	-	812	215	1,109	0	-	-	812	215	1,109
16	2162	2171	317	211	1,776	1,713	215	1,059	887	313	790	2,917	245	1,000
17	2172	2181	0	-	-	0	-	-	71	340	762	71	340	762
18	2182	2191	0	-	-	0	-	-	0	-	-	0	-	-
19	2192	2201	0	-	-	0	-	-	0	-	-	0	-	-
20	2202	2211	0	-	-	0	-	-	0	-	-	0	-	-
21	2212	2221	0	-	-	0	-	-	0	-	-	0	-	-
22	2222	2231	0	-	-	0	-	-	0	-	-	0	-	-
23	2232	2241	0	-	-	0	-	-	0	-	-	0	-	-
24	2242	2251	0	-	-	0	-	-	0	-	-	0	-	-
25	2252	2261	906	305	1,883	275	310	1,883	10,790	326	667	11,971	324	712
Average			10,454	146	798	9,315	222	789	7,707	321	747	27,476	221	780

[10] Natural Stands are all stands established before 1962.

Table 68 – Block 4 Base Case Average Annual Statistics by Harvest System for Managed[11] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	887	60	643	0	-	-	0	-	-	887	60	643
2	2022	2031	28,332	61	613	33	70	782	0	-	-	28,364	61	614
3	2032	2041	81,157	74	688	28,400	75	769	0	-	-	109,557	74	707
4	2042	2051	102,418	76	683	8,469	79	802	245	150	1,139	111,132	76	692
5	2052	2061	62,782	80	726	72,273	91	896	868	160	1,184	135,923	86	810
6	2062	2071	101,037	95	923	124,035	94	906	0	-	-	225,072	94	914
7	2072	2081	85,428	101	986	120,072	100	864	0	-	-	205,500	100	911
8	2082	2091	85,664	91	997	145,328	100	888	98	173	1,255	231,090	96	925
9	2092	2101	181,197	89	1,014	55,706	89	955	442	106	1,136	237,345	89	1,000
10	2102	2111	164,263	87	840	63,256	96	939	7,709	117	1,083	235,228	90	871
11	2112	2121	176,199	86	782	67,442	106	935	6,234	124	1,064	249,876	92	824
12	2122	2131	92,680	88	830	121,192	107	845	35,991	115	1,063	249,863	101	865
13	2132	2141	156,636	81	769	75,204	93	853	18,039	119	1,080	249,878	88	810
14	2142	2151	118,113	74	770	131,764	92	861	0	-	-	249,878	84	816
15	2152	2161	123,484	68	842	125,582	86	868	0	-	-	249,066	77	855
16	2162	2171	52,602	74	771	159,246	113	856	35,113	155	1,089	246,961	111	862
17	2172	2181	168,181	76	705	45,697	101	845	35,929	146	1,063	249,807	90	765
18	2182	2191	147,392	74	681	66,487	107	841	36,000	149	1,048	249,878	93	758
19	2192	2201	89,499	70	666	124,378	99	847	36,000	151	1,073	249,877	96	794
20	2202	2211	159,879	74	650	53,999	88	861	36,000	175	1,069	249,878	91	730
21	2212	2221	156,068	67	783	57,811	80	881	36,000	173	1,041	249,878	86	834
22	2222	2231	66,840	65	728	158,472	95	851	24,565	183	1,020	249,877	96	827
23	2232	2241	48,231	62	649	165,647	96	848	36,000	128	1,056	249,878	94	823
24	2242	2251	142,760	75	656	82,480	93	851	24,638	123	1,073	249,878	85	740
25	2252	2261	128,309	76	678	101,069	92	852	8,529	216	1,104	237,907	88	754
Average			108,801	79	761	86,162	96	866	15,136	149	1,063	210,099	91	818

[11] Managed Stands are all stands established since 1962.

Table 69 – Block 4 Base Case Average Annual Contributions of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Natural Stands				Managed Stands				Total			
			Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)	Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)	Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)
1	2012	2021	196,069	115,208	37,843	21,740	887	335	0	9	196,956	115,543	37,843	21,749
2	2022	2031	168,592	102,907	40,736	10,932	28,364	13,189	215	916	196,957	116,096	40,951	11,849
3	2032	2041	87,403	50,619	21,552	10,556	109,557	43,196	982	10,447	196,960	93,815	22,534	21,003
4	2042	2051	85,827	56,645	19,753	4,879	111,132	50,185	2,677	14,391	196,959	106,831	22,429	19,270
5	2052	2061	80,733	50,075	15,623	9,789	135,923	91,321	12,754	14,278	216,656	141,397	28,377	24,067
6	2062	2071	12,273	6,500	3,496	1,210	225,072	166,852	25,790	21,210	237,345	173,352	29,286	22,420
7	2072	2081	31,845	25,104	4,828	1,066	205,500	142,073	32,326	22,543	237,345	167,176	37,154	23,609
8	2082	2091	6,255	4,313	1,212	368	231,090	161,094	27,456	24,082	237,345	165,407	28,668	24,450
9	2092	2101	0	0	0	0	237,345	181,768	24,742	9,137	237,345	181,768	24,742	9,137
10	2102	2111	2,117	1,379	682	47	235,228	155,061	24,690	35,984	237,345	156,440	25,372	36,031
11	2112	2121	2	1	0	0	249,876	156,121	31,167	41,701	249,878	156,122	31,167	41,701
12	2122	2131	14	8	0	6	249,863	144,000	35,732	42,684	249,877	144,008	35,732	42,690
13	2132	2141	0	0	0	0	249,878	157,965	24,992	46,309	249,878	157,965	24,992	46,309
14	2142	2151	0	0	0	0	249,878	166,634	20,655	40,932	249,878	166,634	20,655	40,932
15	2152	2161	812	631	148	32	249,066	185,698	12,903	30,261	249,878	186,329	13,051	30,292
16	2162	2171	2,917	1,849	506	481	246,961	148,320	35,266	35,547	249,878	150,169	35,772	36,028
17	2172	2181	71	33	35	1	249,807	153,113	29,233	40,889	249,878	153,146	29,268	40,889
18	2182	2191	0	0	0	0	249,878	145,602	32,869	41,720	249,878	145,602	32,869	41,720
19	2192	2201	0	0	0	0	249,877	147,894	31,539	42,580	249,877	147,894	31,539	42,580
20	2202	2211	0	0	0	0	249,878	149,499	28,748	44,124	249,878	149,499	28,748	44,124
21	2212	2221	0	0	0	0	249,878	177,527	16,899	25,077	249,878	177,527	16,899	25,077
22	2222	2231	0	0	0	0	249,877	155,389	26,929	36,799	249,877	155,389	26,929	36,799
23	2232	2241	0	0	0	0	249,878	156,089	26,976	42,452	249,878	156,089	26,976	42,452
24	2242	2251	0	0	0	0	249,878	152,060	27,796	46,282	249,878	152,060	27,796	46,282
25	2252	2261	11,971	6,520	2,230	996	237,907	146,112	25,731	44,409	249,877	152,631	27,962	45,405
Average			27,476	16,872	5,946	2,484	210,099	133,884	22,363	30,190	237,575	150,756	28,308	32,674

Table 70 – Block 4 Base Case Average Ages and Yields of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Hemlock			Balsam			Cedar		
			Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[12]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[12]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[12]
1	2012	2021	115,543	205	730	37,843	251	730	21,749	286	738
2	2022	2031	116,096	176	754	40,951	263	771	11,849	197	755
3	2032	2041	93,815	138	723	22,534	288	721	21,003	92	723
4	2042	2051	106,831	128	748	22,429	249	747	19,270	92	748
5	2052	2061	141,397	134	828	28,377	203	828	24,067	157	828
6	2062	2071	173,352	100	913	29,286	116	913	22,420	97	914
7	2072	2081	167,176	109	958	37,154	113	958	23,609	100	958
8	2082	2091	165,407	99	936	28,668	109	903	24,450	95	936
9	2092	2101	181,768	87	1010	24,742	109	907	9,137	83	1010
10	2102	2111	156,440	90	880	25,372	98	865	36,031	90	879
11	2112	2121	156,122	90	832	31,167	101	827	41,701	91	829
12	2122	2131	144,008	99	873	35,732	107	869	42,690	101	877
13	2132	2141	157,965	87	818	24,992	90	814	46,309	88	818
14	2142	2151	166,634	82	824	20,655	89	801	40,932	84	824
15	2152	2161	186,329	75	864	13,051	90	815	30,292	82	865
16	2162	2171	150,169	106	872	35,772	134	867	36,028	106	872
17	2172	2181	153,146	87	773	29,268	101	768	40,889	89	773
18	2182	2191	145,602	89	765	32,869	103	764	41,720	93	765
19	2192	2201	147,894	92	802	31,539	109	826	42,580	96	802
20	2202	2211	149,499	87	737	28,748	105	737	44,124	84	732
21	2212	2221	177,527	76	842	16,899	126	789	25,077	81	828
22	2222	2231	155,389	88	835	26,929	113	848	36,799	93	825
23	2232	2241	156,089	91	831	26,976	101	858	42,452	98	831
24	2242	2251	152,060	85	748	27,796	86	747	46,282	85	747
25	2252	2261	152,631	96	759	27,962	111	760	45,405	90	759
Average			150,756	101	822	28,308	137	812	32,674	100	821

[12] Average volume per hectare indicates the average stand volume when the respective species is found within the stand. For example, in Decade #1 the average volume for harvested stands containing hemlock was 730 m^3/ha.

Appendix A4 – Additional Base Case Statistics for Blocks 3 and 5 combined

The following tables provide average annual values per decade for the Base Case harvest schedule for Blocks 3 and 5 combined0.

Table 71 – Blocks 3&5 Base Case Average Annual Statistics by Harvest System

			Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
Period (Decade #)	Start Year	End Year	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	14,012	252	632	22,336	292	666	5,000	297	773	41,349	279	665
2	2022	2031	25,628	104	827	10,722	115	996	5,000	311	761	41,350	132	856
3	2032	2041	25,821	96	707	10,529	117	984	5,000	321	793	41,350	128	772
4	2042	2051	31,157	104	661	5,193	110	782	5,000	331	852	41,350	132	693
5	2052	2061	15,509	75	560	20,841	92	808	5,000	343	811	41,350	116	693
6	2062	2071	182	169	1,151	37,175	98	816	3,993	300	832	41,350	118	819
7	2072	2081	17,597	78	563	18,753	112	853	5,000	289	824	41,350	119	698
8	2082	2091	19,985	76	520	19,980	113	812	5,000	305	845	44,965	118	652
9	2092	2101	9,908	73	517	30,056	116	983	5,000	201	1,011	44,964	116	822
10	2102	2111	2,597	73	559	39,686	115	944	2,681	119	1,104	44,964	113	915
11	2112	2121	19,268	81	573	22,354	109	798	3,342	123	1,006	44,964	98	692
12	2122	2131	31,184	86	581	8,781	106	787	5,000	125	991	44,965	94	643
13	2132	2141	25,877	69	484	14,898	110	801	4,190	131	1,006	44,965	89	590
14	2142	2151	13,404	63	454	29,060	90	768	2,500	149	1,059	44,965	85	645
15	2152	2161	3,687	65	454	36,278	122	905	5,000	146	1,031	44,965	120	848
16	2162	2171	0	-	-	39,965	164	1,169	5,000	149	1,030	44,965	163	1,151
17	2172	2181	4,528	83	628	35,436	114	846	5,000	148	1,029	44,964	114	833
18	2182	2191	3,638	77	612	36,327	93	760	5,000	146	1,041	44,965	98	768
19	2192	2201	21,903	81	587	18,061	93	763	5,000	155	1,063	44,964	94	685
20	2202	2211	24,411	87	629	15,553	100	743	4,999	161	1,096	44,964	100	699
21	2212	2221	32,867	82	629	7,097	101	754	5,000	158	1,078	44,965	94	678
22	2222	2231	17,102	92	746	22,863	94	763	5,000	164	1,097	44,964	101	783
23	2232	2241	4,878	95	713	35,086	94	781	5,000	160	1,077	44,965	102	797
24	2242	2251	13,908	106	733	26,056	105	821	5,000	169	1,108	44,964	112	814
25	2252	2261	7,072	81	619	32,893	94	758	4,250	177	1,145	44,215	100	755
Average			15,445	92	605	23,839	115	833	4,638	207	957	43,922	117	744

Table 72 – Blocks 3&5 Base Case Average Annual Statistics by Harvest System for Natural[13] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	14,012	252	632	22,336	292	666	5,000	297	773	41,349	279	665
2	2022	2031	22,395	110	938	10,595	115	998	5,000	311	761	37,991	138	925
3	2032	2041	17,160	112	958	10,529	117	984	5,000	321	793	32,689	145	936
4	2042	2051	20,802	122	828	4,107	119	764	5,000	331	852	29,909	157	822
5	2052	2061	38	350	703	1,196	127	773	5,000	343	811	6,234	302	803
6	2062	2071	66	149	1524	989	204	780	3,993	300	832	5,048	279	826
7	2072	2081	664	168	1,114	931	290	837	5,000	289	824	6,595	277	848
8	2082	2091	315	202	1,117	413	233	794	5,000	305	845	5,728	295	852
9	2092	2101	0	-	-	778	181	840	2,377	285	902	3,155	259	886
10	2102	2111	0	-	-	0	-	-	0	-	-	0	-	-
11	2112	2121	0	-	-	0	-	-	0	-	-	0	-	-
12	2122	2131	0	-	-	0	-	-	0	-	-	0	-	-
13	2132	2141	0	-	-	52	350	489	0	-	-	52	350	489
14	2142	2151	0	-	-	0	-	-	0	-	-	0	-	-
15	2152	2161	0	-	-	0	-	-	0	-	-	0	-	-
16	2162	2171	0	-	-	1,452	241	1,137	0	-	-	1,452	241	1137
17	2172	2181	0	-	-	0	-	-	0	-	-	0	-	-
18	2182	2191	0	-	-	0	-	-	0	-	-	0	-	-
19	2192	2201	0	-	-	0	-	-	0	-	-	0	-	-
20	2202	2211	0	-	-	0	-	-	0	-	-	0	-	-
21	2212	2221	0	-	-	0	-	-	0	-	-	0	-	-
22	2222	2231	0	-	-	0	-	-	0	-	-	0	-	-
23	2232	2241	0	-	-	0	-	-	0	-	-	0	-	-
24	2242	2251	0	-	-	0	-	-	0	-	-	0	-	-
25	2252	2261	0	-	-	0	-	-	0	-	-	0	-	-
Average			3,018	141	838	2,135	200	797	1,655	311	814	6,808	201	819

[13] Natural Stands are all stands established before 1962.

Table 73 – Blocks 3&5 Base Case Average Annual Statistics by Harvest System for Managed[14] Stands

Period (Decade #)	Start Year	End Year	Ground-based Harvesting			Cable Harvesting			Non-conventional Harvesting			Total		
			Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)	Harvest Volume (m^3)	Average Harvest Age (years)	Average Harvest Volume per Ha (m^3/ha)
1	2012	2021	0	-	-	0	-	-	0	-	-	0	-	-
2	2022	2031	3,233	62	455	127	145	867	0	-	-	3,359	65	463
3	2032	2041	8,661	64	465	0	-	-	0	-	-	8,661	64	465
4	2042	2051	10,355	66	471	1,086	78	860	0	-	-	11,441	67	492
5	2052	2061	15,470	74	560	19,646	90	810	0	-	-	35,116	83	677
6	2062	2071	116	180	1,010	36,186	95	817	0	-	-	36,302	95	818
7	2072	2081	16,933	74	553	17,822	102	854	0	-	-	34,755	89	675
8	2082	2091	19,670	74	516	19,567	111	812	0	-	-	39,236	92	631
9	2092	2101	9,908	73	517	29,278	114	987	2,623	126	1,136	41,809	105	817
10	2102	2111	2,597	73	559	39,686	115	944	2,681	119	1,104	44,964	113	915
11	2112	2121	19,268	81	573	22,354	109	798	3,342	123	1,006	44,964	98	692
12	2122	2131	31,184	86	581	8,781	106	787	5,000	125	991	44,965	94	643
13	2132	2141	25,877	69	484	14,846	109	803	4,190	131	1,006	44,913	88	590
14	2142	2151	13,404	63	454	29,060	90	768	2,500	149	1,059	44,965	85	645
15	2152	2161	3,687	65	454	36,278	122	905	5,000	146	1,031	44,965	120	848
16	2162	2171	0	-	-	38,512	162	1,170	5,000	149	1,030	43,512	160	1,152
17	2172	2181	4,528	83	628	35,436	114	846	5,000	148	1,029	44,964	114	833
18	2182	2191	3,638	77	612	36,327	93	760	5,000	146	1,041	44,965	98	768
19	2192	2201	21,903	81	587	18,061	93	763	5,000	155	1,063	44,964	94	685
20	2202	2211	24,411	87	629	15,553	100	743	4,999	161	1,096	44,964	100	699
21	2212	2221	32,867	82	629	7,097	101	754	5,000	158	1,078	44,965	94	678
22	2222	2231	17,102	92	746	22,863	94	763	5,000	164	1,097	44,964	101	783
23	2232	2241	4,878	95	713	35,086	94	781	5,000	160	1,077	44,965	102	797
24	2242	2251	13,908	106	733	26,056	105	821	5,000	169	1,108	44,964	112	814
25	2252	2261	7,072	81	619	32,893	94	758	4,250	177	1,145	44,215	100	755
Average			12,427	79	567	21,704	107	836	2,983	149	1,061	37,114	101	732

[14] Managed Stands are all stands established since 1962.

Table 74 – Blocks 3&5 Base Case Average Annual Contributions of Hemlock, Balsam and Cedar

Period (Decade #)	Start Year	End Year	Natural Stands				Managed Stands				Total			
			Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)	Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)	Harvest Volume (m^3)	Hemlock Harvest Volume (m^3)	Balsam Harvest Volume (m^3)	Cedar Harvest Volume (m^3)
1	2012	2021	41,349	16,958	5,523	14,050	0	0	0	0	41,349	16,958	5,523	14,050
2	2022	2031	37,991	28,630	4,772	3,485	3,359	2,263	465	344	41,350	30,893	5,236	3,828
3	2032	2041	32,689	22,767	3,370	5,898	8,661	3,954	754	2,957	41,350	26,721	4,124	8,854
4	2042	2051	29,909	17,710	2,631	8,870	11,441	4,234	852	5,284	41,350	21,945	3,484	14,154
5	2052	2061	6,234	3,329	1,668	863	35,116	16,123	2,480	15,418	41,350	19,452	4,148	16,281
6	2062	2071	5,048	2,560	1,308	839	36,302	18,874	3,319	9,892	41,350	21,435	4,627	10,731
7	2072	2081	6,595	3,401	1,752	1,161	34,755	16,420	6,489	5,108	41,350	19,821	8,241	6,269
8	2082	2091	5,728	2,889	1,716	807	39,236	11,123	2,751	13,788	44,965	14,012	4,467	14,595
9	2092	2101	3,155	1,938	584	514	41,809	16,476	4,137	17,349	44,964	18,414	4,720	17,863
10	2102	2111	0	0	0	0	44,964	18,210	3,454	17,380	44,964	18,210	3,454	17,380
11	2112	2121	0	0	0	0	44,964	13,260	3,313	18,928	44,964	13,260	3,313	18,928
12	2122	2131	0	0	0	0	44,965	11,293	2,856	20,280	44,965	11,293	2,856	20,280
13	2132	2141	52	24	5	6	44,913	9,283	4,968	19,934	44,965	9,307	4,973	19,940
14	2142	2151	0	0	0	0	44,965	3,008	10,631	20,831	44,965	3,008	10,631	20,831
15	2152	2161	0	0	0	0	44,965	7,193	7,807	21,667	44,965	7,193	7,807	21,667
16	2162	2171	1,452	1,029	1	423	43,512	19,212	8,813	10,840	44,965	20,240	8,813	11,263
17	2172	2181	0	0	0	0	44,964	6,896	11,202	15,642	44,964	6,896	11,202	15,642
18	2182	2191	0	0	0	0	44,965	4,498	8,706	20,645	44,965	4,498	8,706	20,645
19	2192	2201	0	0	0	0	44,964	7,583	5,387	20,279	44,964	7,583	5,387	20,279
20	2202	2211	0	0	0	0	44,964	11,127	1,670	20,662	44,964	11,127	1,670	20,662
21	2212	2221	0	0	0	0	44,965	8,776	4,321	20,259	44,965	8,776	4,321	20,259
22	2222	2231	0	0	0	0	44,964	3,874	8,638	20,563	44,964	3,874	8,638	20,563
23	2232	2241	0	0	0	0	44,965	3,108	10,331	19,376	44,965	3,108	10,331	19,376
24	2242	2251	0	0	0	0	44,964	5,647	8,950	17,917	44,964	5,647	8,950	17,917
25	2252	2261	0	0	0	0	44,215	4,535	7,947	19,867	44,215	4,535	7,947	19,867
Average			6,808	4,049	933	1,477	37,114	9,079	5,210	15,008	43,922	13,128	6,143	16,485

Table 75 – Blocks 3&5 Base Case Average Ages and Yields of Hemlock, Balsam and Cedar

			Hemlock			Balsam			Cedar		
Period (Decade #)	Start Year	End Year	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[15]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[15]	Species Harvest Volume (m^3)	Average Stand Harvest Age (years)	Average Stand Harvest Volume per Ha (m^3/ha)[15]
1	2012	2021	16,958	270	672	5,523	281	672	14,050	288	671
2	2022	2031	30,893	122	865	5,236	152	866	3,828	175	889
3	2032	2041	26,721	124	780	4,124	153	775	8,854	127	785
4	2042	2051	21,945	133	700	3,484	195	698	14,154	116	699
5	2052	2061	19,452	119	700	4,148	186	700	16,281	91	697
6	2062	2071	21,435	116	827	4,627	153	828	10,731	106	827
7	2072	2081	19,821	121	705	8,241	135	799	6,269	114	688
8	2082	2091	14,012	141	723	4,467	163	731	14,595	97	659
9	2092	2101	18,414	126	877	4,720	127	895	17,863	108	830
10	2102	2111	18,210	116	942	3,454	110	972	17,380	111	923
11	2112	2121	13,260	102	708	3,313	108	814	18,928	94	699
12	2122	2131	11,293	95	639	2,856	110	721	20,280	92	648
13	2132	2141	9,307	93	617	4,973	93	695	19,940	86	596
14	2142	2151	3,008	89	540	10,631	90	709	20,831	84	651
15	2152	2161	7,193	151	946	7,807	103	932	21,667	123	857
16	2162	2171	20,240	182	1308	8,813	155	1190	11,263	146	1164
17	2172	2181	6,896	137	874	11,202	117	851	15,642	104	837
18	2182	2191	4,498	109	786	8,706	97	797	20,645	96	774
19	2192	2201	7,583	90	643	5,387	102	811	20,279	90	684
20	2202	2211	11,127	96	699	1,670	141	859	20,662	96	701
21	2212	2221	8,776	93	675	4,321	100	748	20,259	90	679
22	2222	2231	3,874	111	790	8,638	99	807	20,563	97	785
23	2232	2241	3,108	111	830	10,331	99	811	19,376	97	797
24	2242	2251	5,647	117	838	8,950	109	835	17,917	106	811
25	2252	2261	4,535	103	733	7,947	99	775	19,867	96	758
Average			13,128	129	757	6,143	125	805	16,485	108	749

[15] Average volume per hectare indicates the average stand volume when the respective species is found within the stand. For example, in Decade #1 the average volume for harvested stands containing hemlock was 672 m^3/ha.

Appendix B: Alternative Harvest Flows and Sensitivity Analyses Details by Supply Block

Appendix B1 – Maintain Current AAC

Maintaining the current AAC contribution of Block 1 (roughly 408,000 m^3/year) for the first 10 years allows the balance of the schedule to be 435,900 m^3/year; 600 m^3/year (0.1%) higher than the Base Case. Overall, 129,000 m^3 less is harvested.

Table 76 – Block 1 Harvest levels maintaining current AAC

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Maintain current AAC	Difference
1	2012	2021	435,300	408,000	- 27,300
2 - 25	2022	2261	435,300	435,900	+ 600

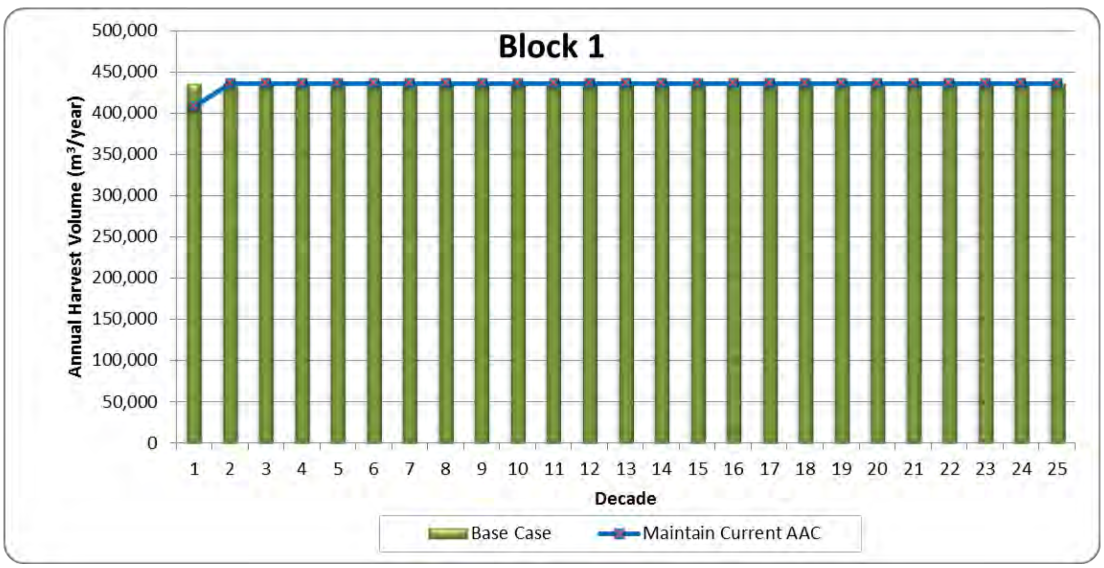

Figure 77 – Block 1 Harvest levels maintaining current AAC

Maintaining the current AAC contribution of Block 2 (about 1,068,800 m^3/year) for the first 10 years requires declines of 20% for each of the following 2 decades and lengthens the mid-term timber supply "dip". The long-term harvest level (LTHL) is 829,000 m^3/year; 4,700 m^3/year (0.6%) less than the Base Case. Total harvest is 1.12 million m^3 (0.6%) less. The higher short-term harvest level greatly reduces the available inventory, thus pushing harvest to shorter rotations and making mid and long-term timber supply more reliant on minimum harvest criteria.

Table 77 - Block 2 Harvest levels maintaining current AAC

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Maintain current AAC	Difference
1	2012	2021	864,300	1,068,800	+ 204,500
2	2022	2031	777,900	855,000	+ 77,100
3 - 5	2032	2061	706,100	684,000	- 22,100
6	2062	2071	756,100	684,000	- 72,100
7	2072	2081	806,100	714,500	- 91,600
8	2082	2091	833,700	764,500	- 69,200
9	2092	2101	833,700	814,500	- 19,200
10 - 25	2102	2261	833,700	829,000	- 4,700

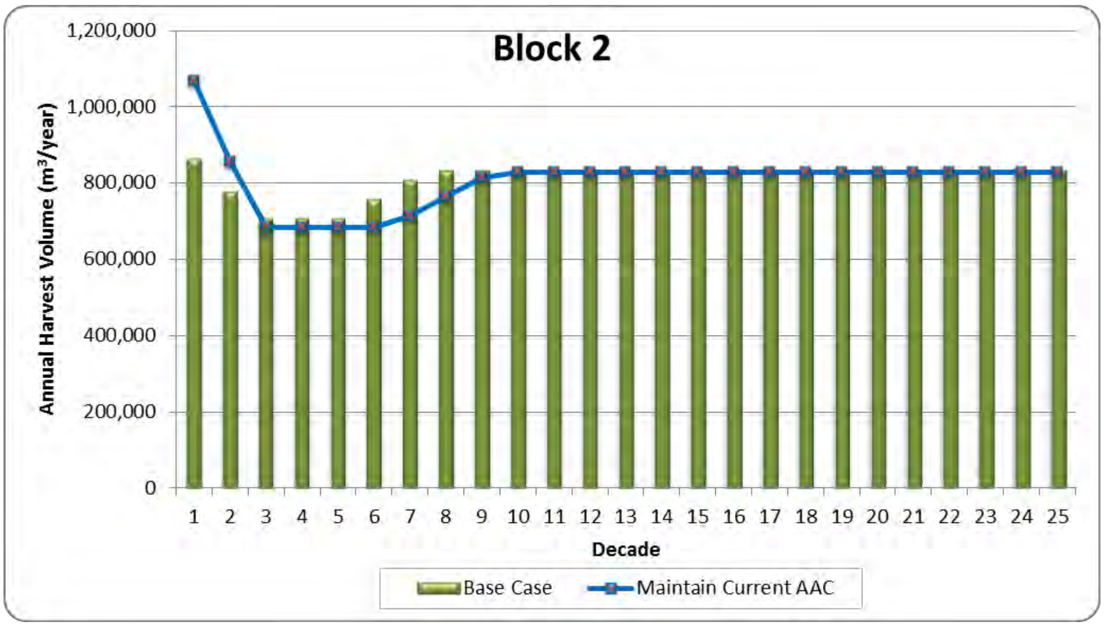

Figure 78 – Block 2 Harvest levels maintaining current AAC

Maintaining the current AAC contribution of Block 4 (approximately 248,700 m^3/year) for 10 years can be done if harvest declines 11% in the second decade. Over the first 50 years, this alternate schedule harvests 1.3 million m^3 (12.9%) more than the Base Case; however over the balance of the schedule approximately 1.5 million m^3 (3.0%) less is harvested. Overall, 213,000 m^3 (0.4%) less is harvested. Like in Block 2, the higher short-term harvest level greatly reduces the available inventory, thus pushing harvest to shorter rotations and making mid and long-term timber supply more dependent on minimum harvest criteria.

Table 78 - Block 4 Harvest levels maintaining current AAC

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Maintain current AAC	Difference
1	2012	2021	197,000	248,700	+ 51,700
2 - 4	2022	2051	197,000	221,300	+ 24,300
5	2052	2061	216,700	221,300	+ 4,600
6 - 9	2062	2101	237,300	221,300	- 16,000
10	2102	2111	237,300	222,800	- 14,500
11 - 25	2112	2261	249,900	245,100	- 4,800

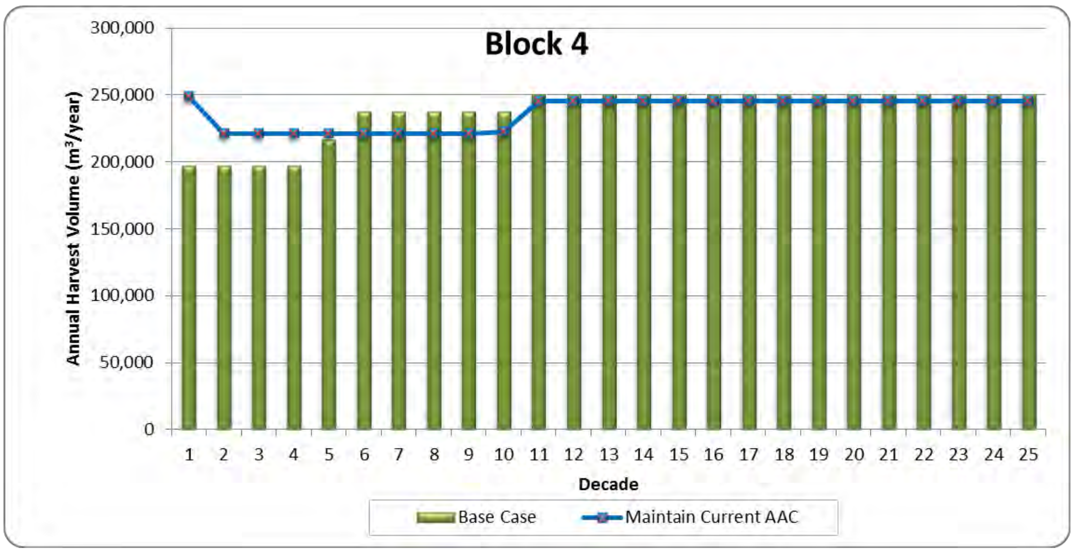

Figure 79 – Block 4 Harvest levels maintaining current AAC

It is infeasible to maintain the AAC contribution for Blocks 3 and 5 at 125,000 m^3/year due to insufficient harvestable inventory. The highest possible initial harvest level was determined to be 115,000 m^3/year. This high initial harvest level requires a significant mid-term "dip" to allow harvestable inventory to grow but does achieve a LTHL 5,100 m^3/year (11%) higher. Overall 224,000 m^3 (2%) less is harvested.

Table 79 - Block 3&5 Harvest levels maintaining current AAC

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Maintain current AAC	Difference
1	2012	2021	41,300	115,000	+ 73,700
2 - 7	2022	2081	41,300	21,400	- 19,900
8	2082	2091	45,000	26,400	- 18,600
9	2092	2101	45,000	31,400	- 13,600
10	2102	2111	45,000	36,400	- 8,600
11	2112	2121	45,000	41,400	- 3,600
12	2122	2131	45,000	46,400	+ 1,400
13 - 25	2132	2261	45,000	50,100	+5,100

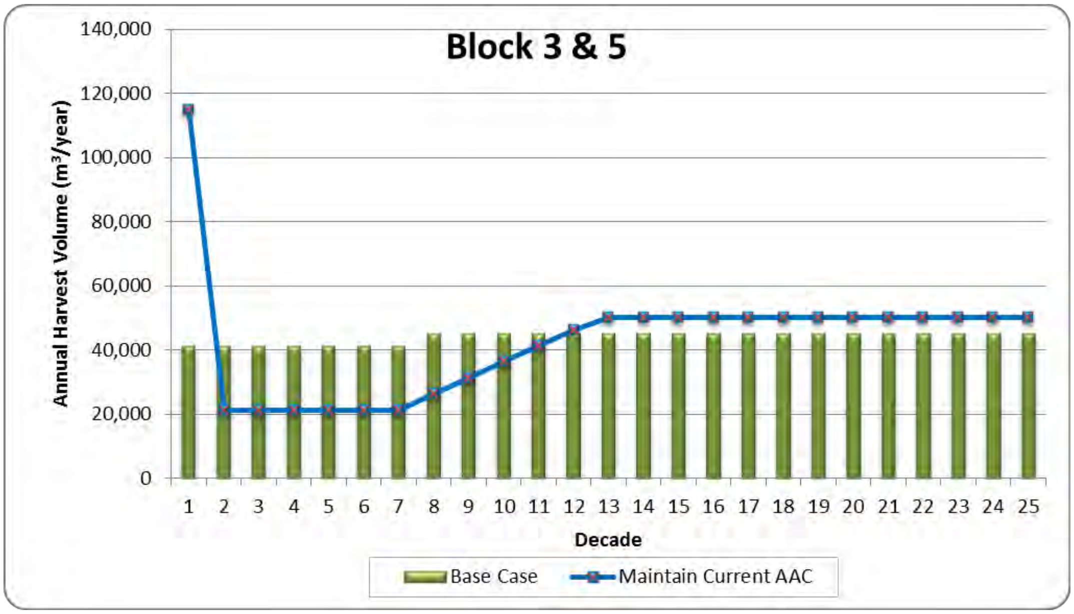

Figure 80 – Block 3&5 Harvest levels maintaining current AAC

Appendix B2 – Non-Declining Even Flow

Since the Base Case for Block 1 is a non-declining even flow (NDEF) schedule, this schedule is the same.

Table 80 – Block 1 NDEF Harvest levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	NDEF	Difference
1 - 25	2012	2261	408,000	435,300	0

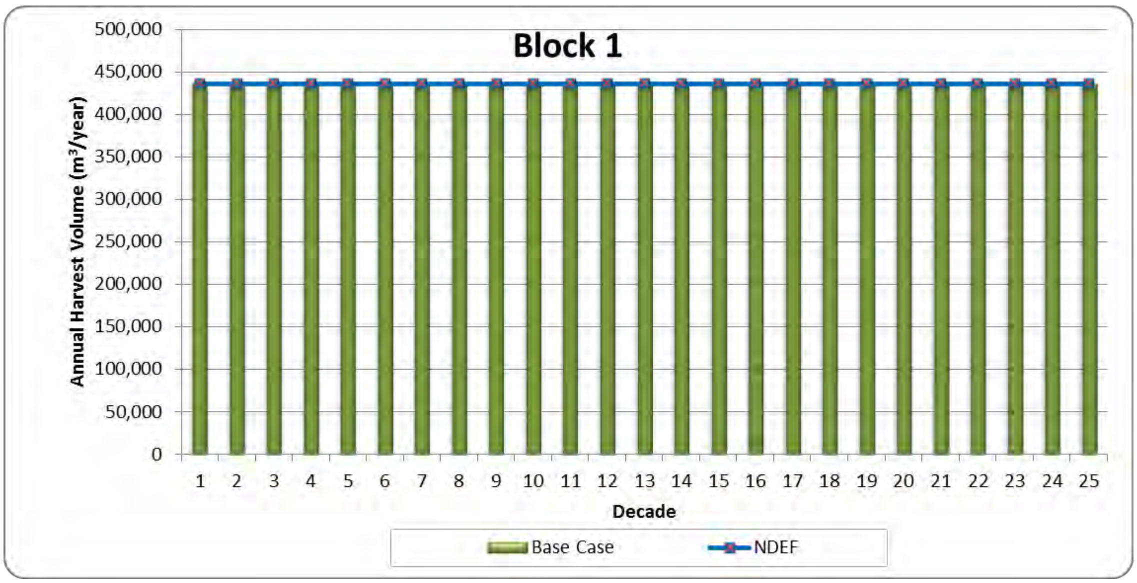

Figure 81 – Block 1 NDEF Harvest levels

A NDEF schedule for Block 2 eliminates the mid-term timber supply "dip" of the Base Case schedule. The harvest level is initially 58,000 m^3/year (6.7%) less but is 100,200 m^3/year (14.2%) greater during Decade 3 to Decade 5 (2032 – 2061). The long-term harvest level (LTHL) is 27,400 m^3/year (3.3%) less than the Base Case and overall, 1.72 million m^3 (0.8%) less is harvested. The higher mid-term harvest level reduces the operable growing stock and shortens the average long-term rotation age by seven years.

Table 81 – Block 2 NDEF Harvest levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	NDEF	Difference
1	2012	2021	864,300	806,300	- 58,000
2	2022	2031	777,900	806,300	+ 28,400
3 - 5	2032	2061	706,100	806,300	+ 100,200
6	2062	2071	756,100	806,300	+ 50,200
7	2072	2081	806,100	806,300	+ 200
8 - 25	2082	2261	833,700	806,300	- 27,400

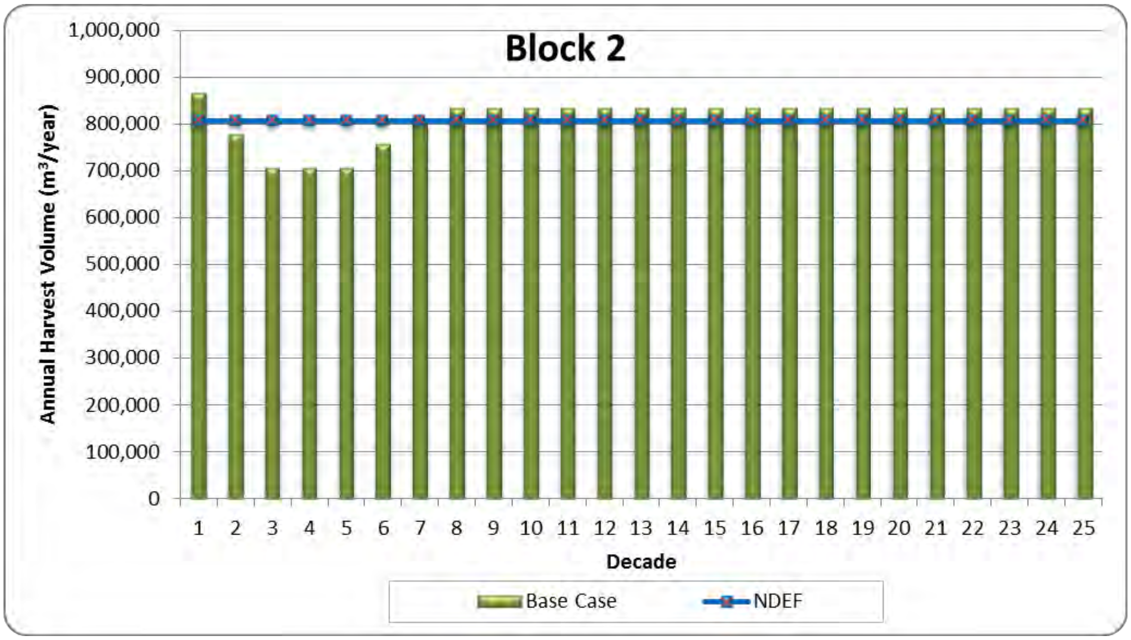

Figure 82 – Block 2 NDEF Harvest levels

The Block 4 NDEF increases the short-term harvest level at the expense of the mid and long-term harvest levels of the Base Case schedule. The short-term harvest level is 28,300 m^3/year (14.4%) higher but harvest is 12,000 m^3/year (5.1%) less in the mid-term and 24,600 m3/year (9.8%) less in the long-term. Overall, 3.07 million m^3 (5.2%) less is harvested. Due to the lack of mature second growth, the higher short-term harvest level greatly reduces the operable growing stock and shortens the average long-term rotation age by ten years.

Table 82 - Block 4 NDEF Harvest levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	NDEF	Difference
1 - 4	2012	2051	197,000	225,300	+ 28,300
5	2052	2061	216,700	225,300	+ 8,600
6 - 10	2062	2111	237,300	225,300	- 12,000
11 - 25	2112	2261	249,900	225,300	- 24,600

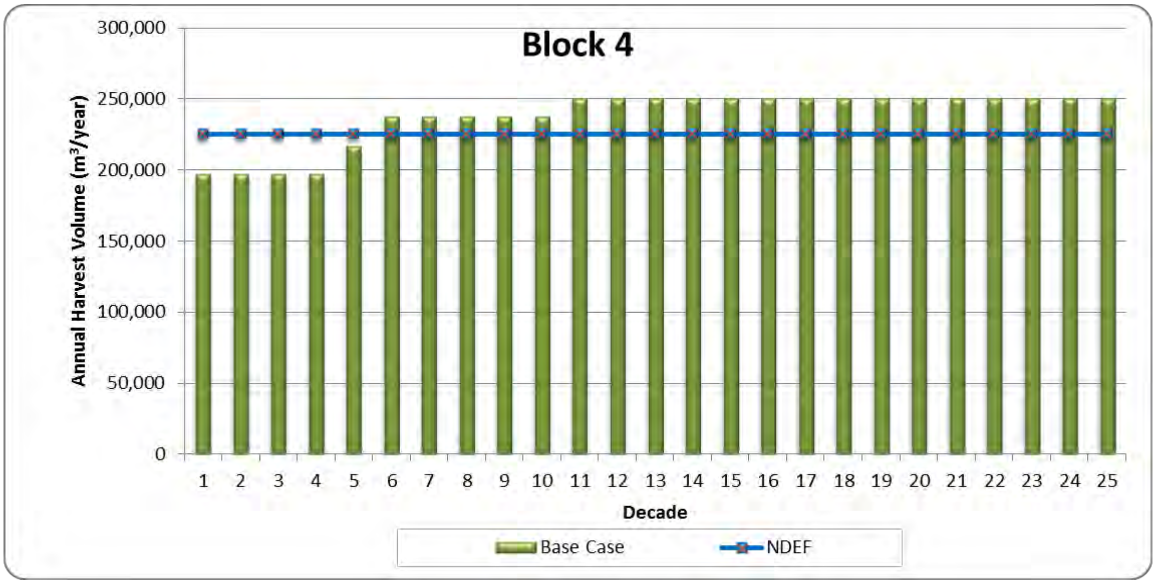

Figure 83 – Block 4 NDEF Harvest levels

The Blocks 3 and 5 NDEF results in an insignificant increase of 100 m^3/year to the short-term harvest level and a long-term harvest level 3,600 m^3/year (8%) less than the Base Case schedule. Overall, 641,000 m^3 (5.8%) less is harvested. Short-term available inventory limits the harvest level when no change in harvest level is allowed.

Table 83 - Block 3&5 NDEF Harvest levels

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	NDEF	Difference
1 - 7	2012	2081	41,300	41,400	+ 100
8 - 25	2082	2261	45,000	41,400	- 3,600

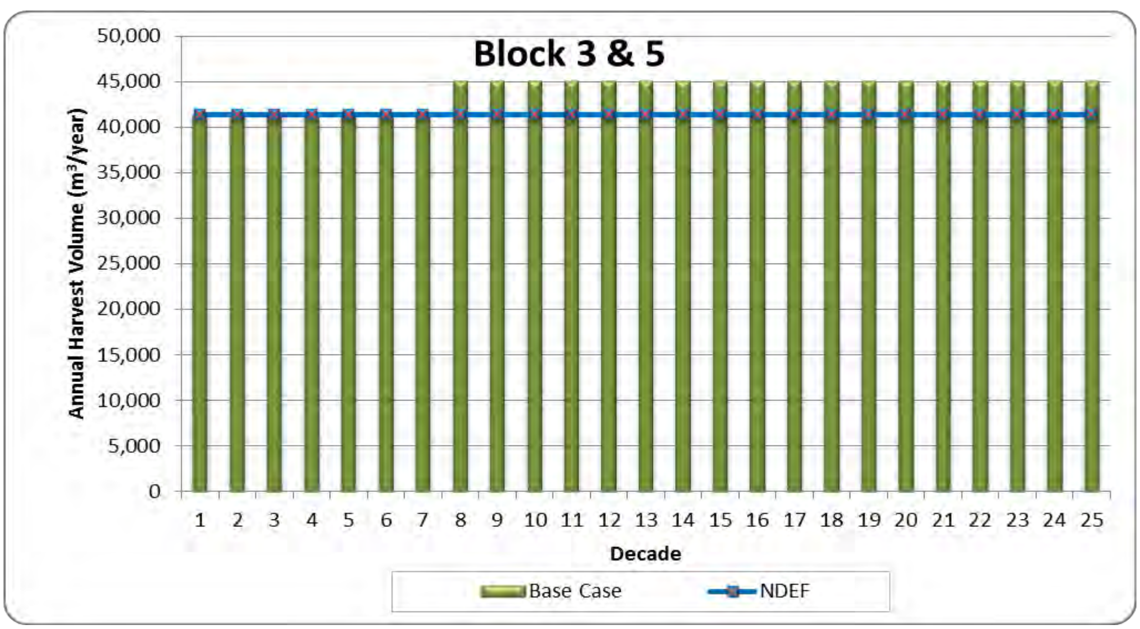

Figure 84 –Block 3&5 NDEF Harvest levels

Appendix B3 – Reduce THLB by 5%

Reducing the THLB of Block 1 by 5% reduces the harvest by 4.4% (19,300 m^3/year). As this schedule is a non-declining even-flow (NDEF), the total harvest is reduced by the same percentage, which equates to 4,825,000 m^3. Alternatively, the initial harvest level of the Base Case can be achieved and the harvest level thereafter is reduced by 4.5% (19,700 m^3/year). This alternate schedule reduces total harvest over the 250 years by 4,728,000 m^3 (4.3%). The reduced harvest is less than the reduction in THLB (percentage wise) due to the restriction placed on contribution from the non-conventional land base nullifying the impact of the reduced non-conventional THLB.

Table 84 – Block 1 Harvest levels with 5% smaller THLB

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Reduced THLB	Difference	Alternate Reduced THLB	Difference
1	2012	2021	435,300	416,000	- 19,300	435,300	0
2 - 25	2022	2261	435,300	416,000	- 19,300	415,600	- 19,700

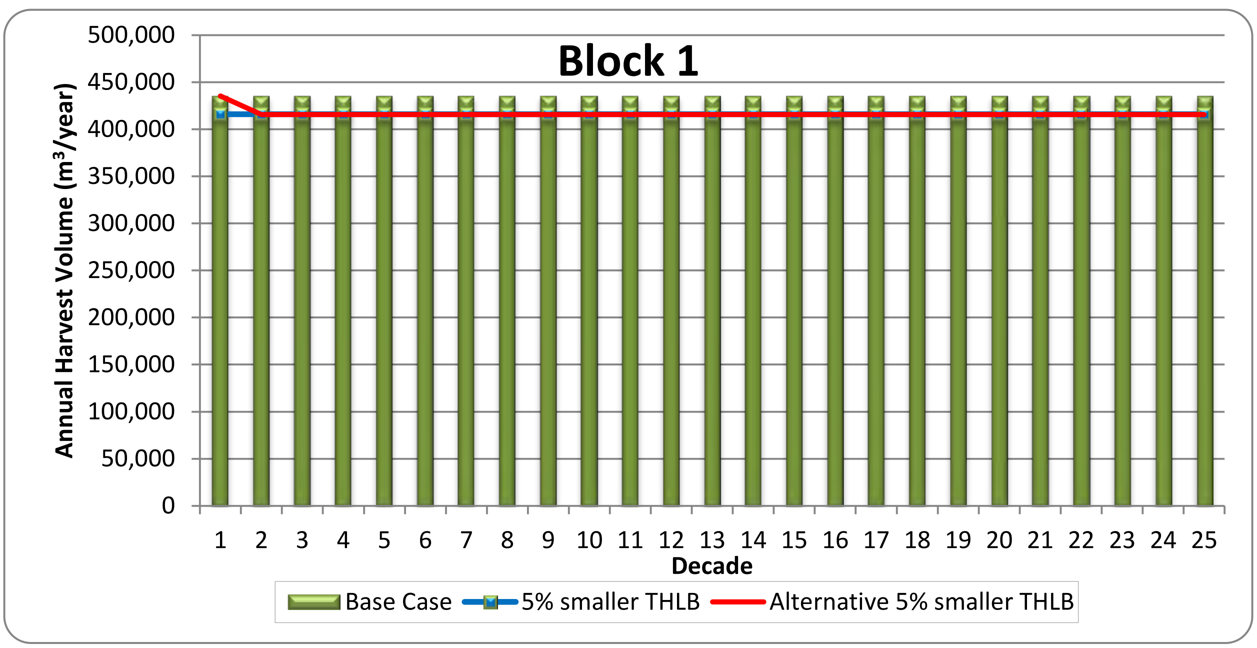

Figure 85 –Block 1 Harvest levels with 5% smaller THLB

Reducing the THLB of Block 2 by 5% reduces the initial harvest by 39,600 m^3/year (4.6%), mid-term harvest by 38,100 m^3/year (5.4%) and long-term harvest by 40,000 m^3/year (4.8%). The total harvest is reduced by 4.8%, or 9.86 million m^3. The harvest reduction is less than the reduction in THLB (percentage wise) due to the restriction placed on contribution from the non-conventional land base partially nullifying the impact of the reduced non-conventional THLB.

Table 85 – Block 2 Harvest levels with 5% smaller THLB

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Reduced THLB	Difference	Alternate Reduced THLB	Difference
1	2012	2021	864,300	824,700	- 39,600	864,300	0
2	2022	2031	777,900	742,200	- 35,700	777,900	0
3 - 5	2032	2061	706,100	668,000	- 38,100	700,100	- 6,000
6	2062	2071	756,100	718,000	- 38,100	700,100	- 56,000
7	2072	2081	806,100	768,000	- 38,100	700,100	- 106,000
8	2082	2091	833,700	793,700	- 40,000	750,100	- 83,600
9 - 25	2022	2261	833,700	793,700	- 40,000	789,900	- 43,800

Alternatively, the initial harvest level of the Base Case can be achieved and short-term timber supply increased. This increase is due to harvest declining by the maximum permitted (10%/decade) in all three schedules. Relative to the Base Case, the mid-term timber supply "dip" is extended by 20 years and the LTHL is reduced by 43,800 m^3/year (5.3%). This alternate schedule reduces total harvest over the 250 years by 10.08 million m^3 (5.0%). The impact to overall timber supply is greater following this schedule due to the higher short-term harvest levels reducing the operable inventory such that long-term average harvest age and therefore average yield is reduced.

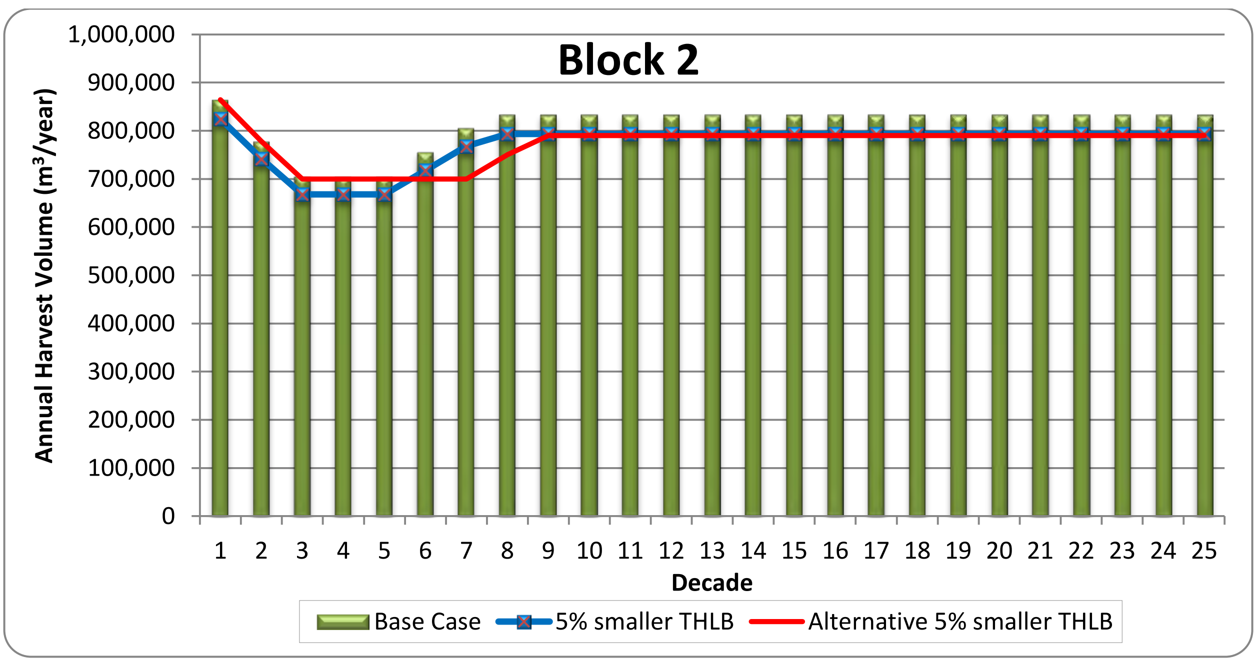

Figure 86 –Block 2 Harvest levels with 5% smaller THLB

Reducing the THLB of Block 4 by 5% reduces the initial harvest by 8,900 m^3/year (4.5%), mid-term harvest by 11,900 m^3/year (5.0%) and long-term harvest by 12,500 m^3/year (5.0%) (see chart below). The total harvest is reduced by 2.94 million m^3, or 5.0%. Alternatively, the initial harvest level of the Base Case can be achieved by marginally reducing mid-term timber supply, with no change to the LTHL or overall harvest.

The percentage reduction in harvest is equal to the percentage reduction in THLB indicating that the timber supply from Block 4 is sensitive to the THLB estimate.

Table 86 – Block 4 Harvest levels with 5% smaller THLB

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Reduced THLB	Difference	Alternate Reduced THLB	Difference
1	2012	2021	197,000	188,100	- 8,900	197,000	0
2 - 4	2022	2051	197,000	188,100	- 8,900	187,100	- 9,900
5	2052	2061	216,700	204,900	- 11,800	204,100	- 12,600
6 -10	2062	2111	237,300	225,400	- 11,900	224,500	- 12,800
11 - 25	2112	2261	249,900	237,400	- 12,500	237,400	- 12,500

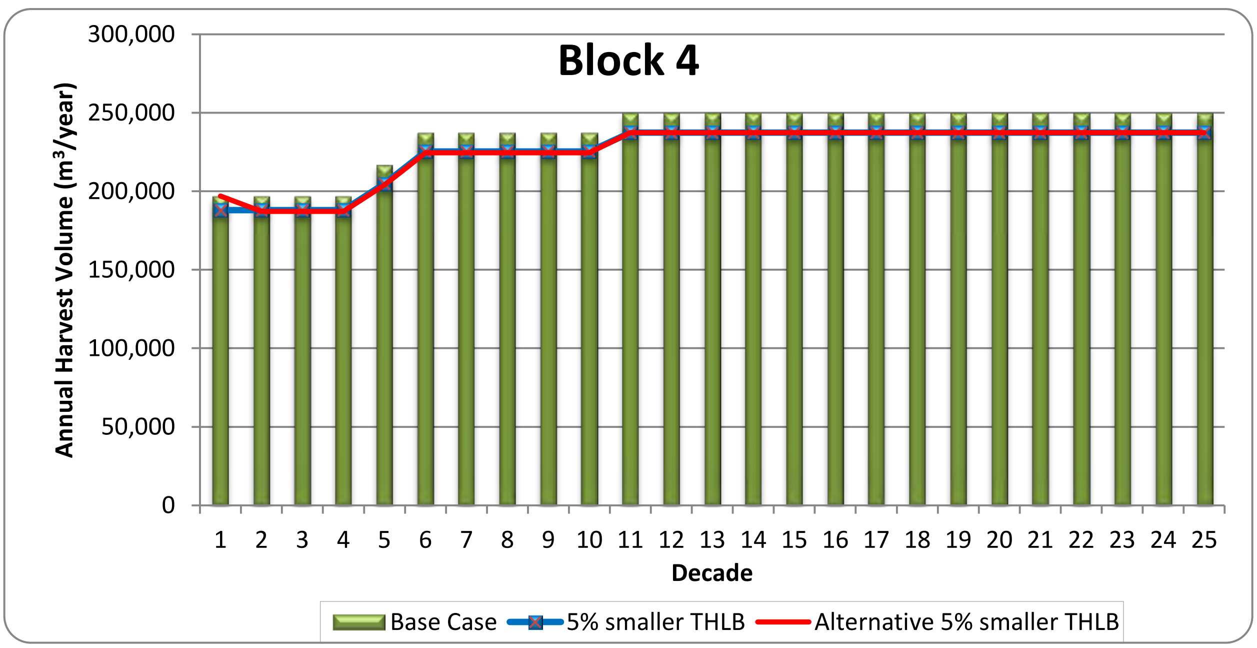

Figure 87 –Block 4 Harvest levels with 5% smaller THLB

Reducing the THLB of Blocks 3/5 by 5% reduces the short-term harvest by 1,800 m^3/year (4.4%), and long-term harvest by 2,100 m^3/year (4.7%) (see chart below). The total harvest is reduced by 504,000 m^3, or 4.6%. Alternatively, the initial harvest level of the Base Case can be achieved by reducing mid-term timber supply, with no change to the LTHL or overall harvest.

Table 87 – Block 3&5 Harvest levels with 5% smaller THLB

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Reduced THLB	Difference	Alternate Reduced THLB	Difference
1	2012	2021	41,300	39,500	- 1,800	41,300	0
2 - 8	2022	2091	41,300	39,500	- 1,800	38,900	- 2,400
9 - 25	2092	2261	45,000	42,900	- 2,100	43,000	- 2,000

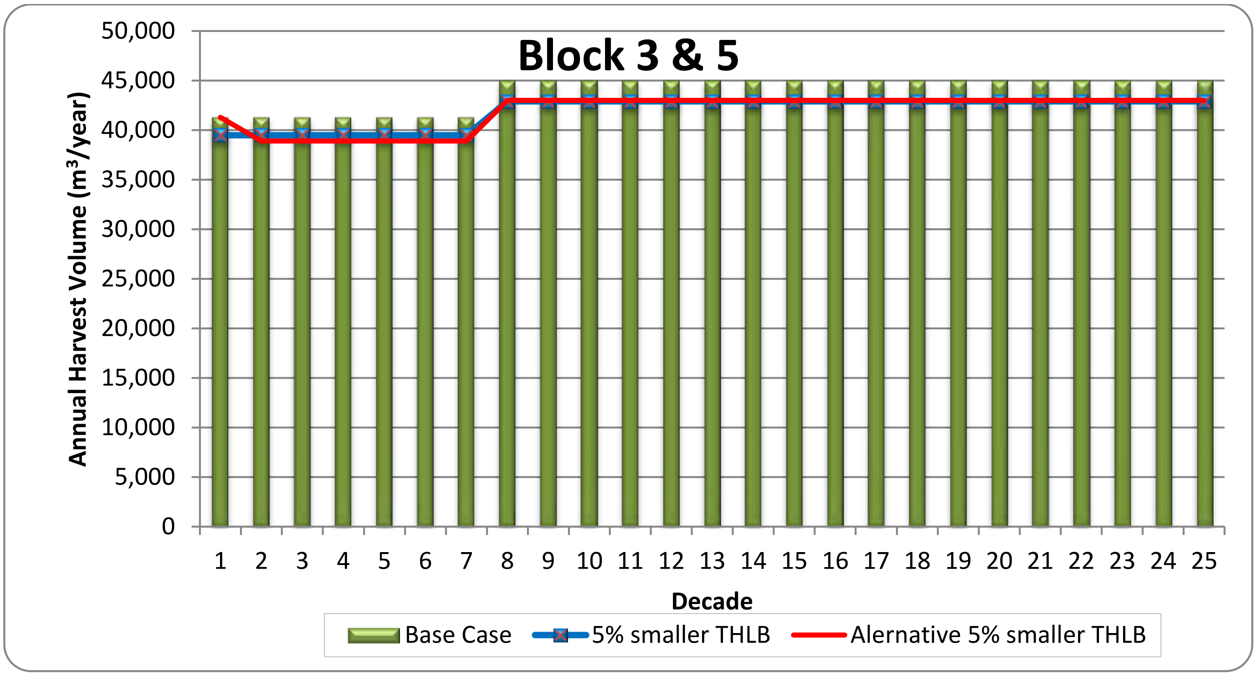

Figure 88 –Block 3&5 Harvest levels with 5% smaller THLB

Appendix B4 – Mature Volumes Increased by 10%

Increasing mature stands (> 140 years old) volume has negligible impact (400 m^3/year or 0.1%) on the timber supply from Block 1 due to the requirement that at least 80% of the harvest be sourced from second growth stands and the constrained contribution from non-conventional stands (of which approximately one-half are mature).

Table 88 – Block 1 Harvest levels with mature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Mature volumes increased	Difference
1 - 25	2012	2261	435,300	435,700	+ 400

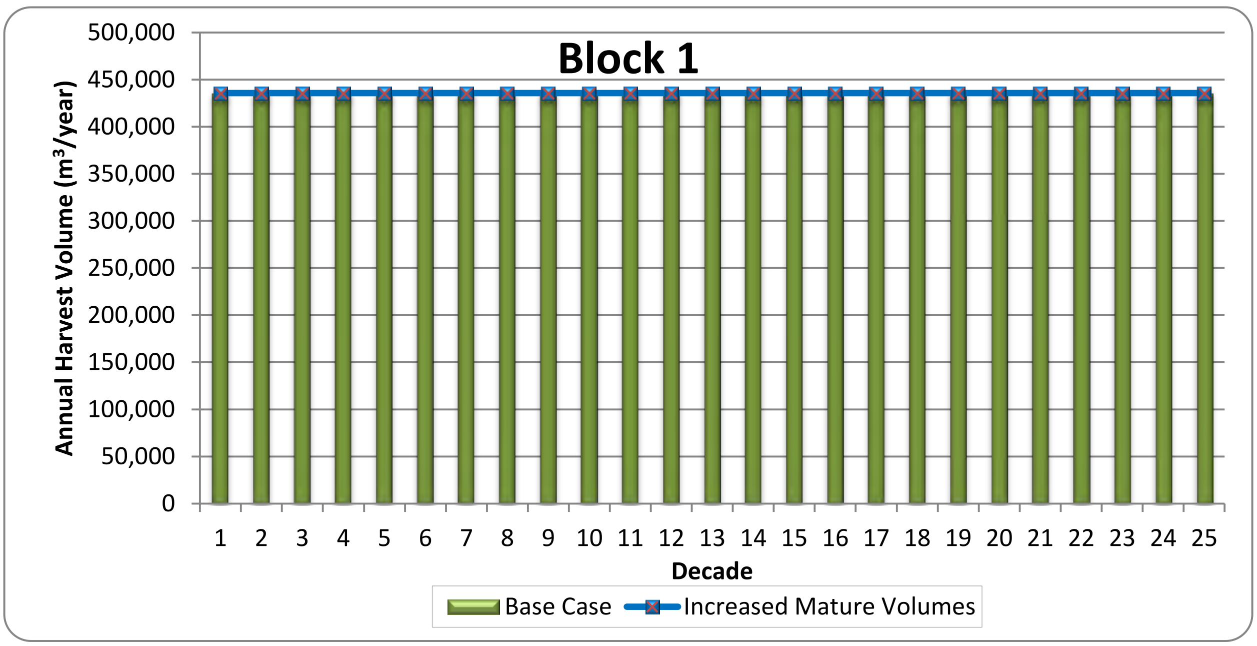

Figure 89 – Block 1 Harvest levels with mature volumes increased 10%

Increasing mature volumes in Block 2 permits the initial harvest to increase by 30,400 m^3/year (3.5%). Gain in the second decade is the same percentage (or 27,300 m^3/year) while mid-term timber supply is increased by 18,600 m^3/year (2.6%). Long-term harvest is basically unaffected with a decrease of 300 m^3/year. Total harvest is increased by 1.45 million m^3 (0.7%). Alternatively, the additional mature volume could be used to lessen the mid-term timber supply "dip" by maintaining the initial harvest level of the Base Case for Block 2 and increasing the mid-term harvest level by 27,400 m3/year (3.9%). The LTHL of this alternate schedule is only 200 m^3/year less than the Base Case LTHL and total harvest is, again, increased by 1.45 million m^3 (0.7%).

Table 89 – Block 2 Harvest levels with mature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Mature volumes increased	Difference	Alternate Mature volumes increased	Difference
1	2012	2021	864,300	894,700	+ 30,400	864,300	0
2	2022	2031	777,900	805,200	+ 27,300	789,300	+11,400
3 - 5	2032	2061	706,100	724,700	+ 18,600	733,500	+ 27,400
6	2062	2071	756,100	774,700	+ 18,600	783,500	+ 27,400
7	2072	2081	806,100	824,700	+ 18,600	833,500	+ 27,400
8 - 25	2082	2261	833,700	833,400	- 300	833,500	- 200

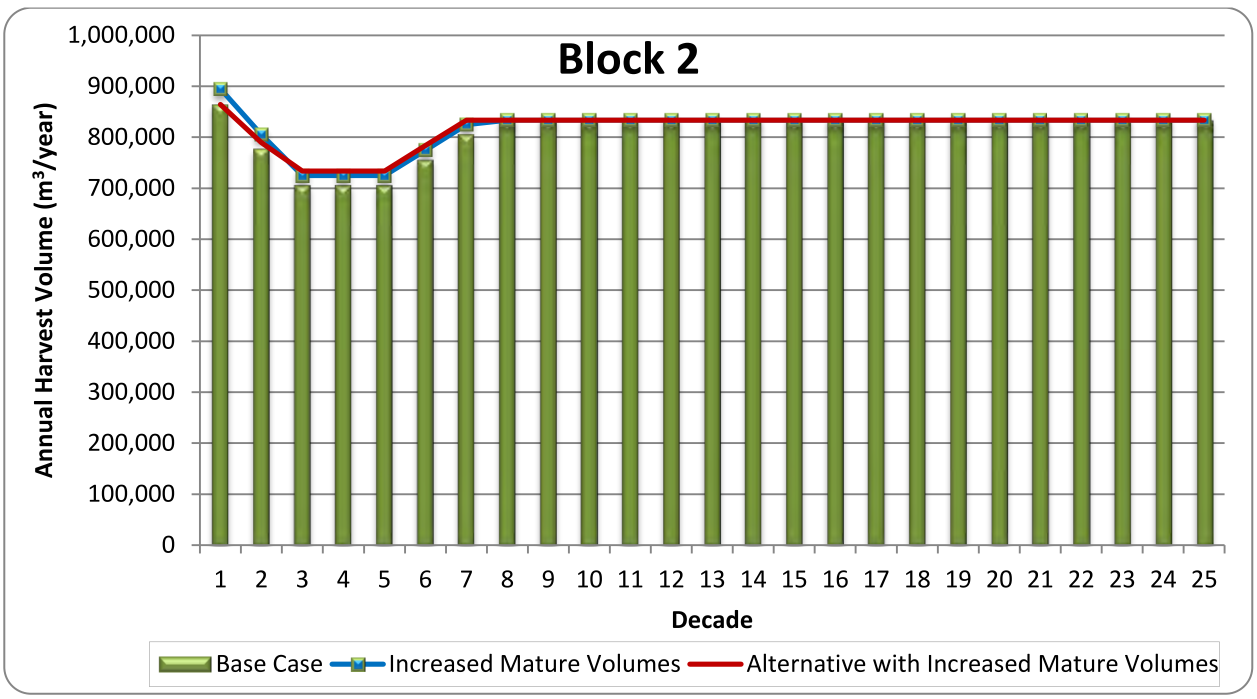

Figure 90 – Block 2 Harvest levels with mature volumes increased 10%

An increase in short-term timber supply of 6,000 m^3/year (3.0%) is possible in Block 4 when mature stands volumes are increased by 10%. Mid-term harvest is increased 1,100 m^3/year (0.5%) and long-term is decreased by 100 m^3/year. Total harvest is increased by 344,000 m^3 (0.6%).

Table 90 – Block 4 Harvest levels with mature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Mature volumes increased	Difference
1 - 4	2012	2051	197,000	203,000	+ 6,000
5	2052	2061	216,700	223,200	+ 6,500
6 -10	2062	2111	237,300	238,400	+ 1,100
11 - 25	2112	2261	249,900	249,800	- 100

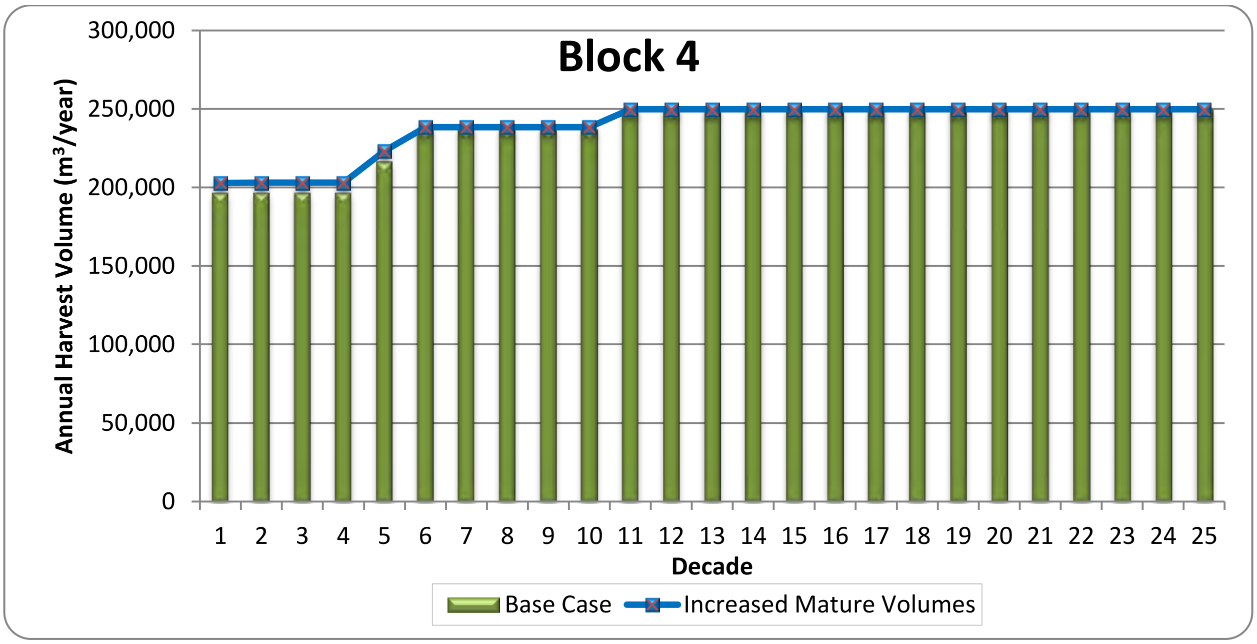

Figure 91 – Block 4 Harvest levels with mature volumes increased 10%

Increasing mature stands volumes by 10% in Blocks 3 and 5 results in 900 m^3/year (2.2%) greater short and mid-term harvest levels and no change to the long-term. Overall 63,000 m^3 (0.6%) more is harvested.

Table 91 – Block 3&5 Harvest levels with mature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Mature volumes increased	Difference
1 – 7	2012	2281	41,300	42,200	+ 900
8 - 25	2082	2261	45,000	45,000	0

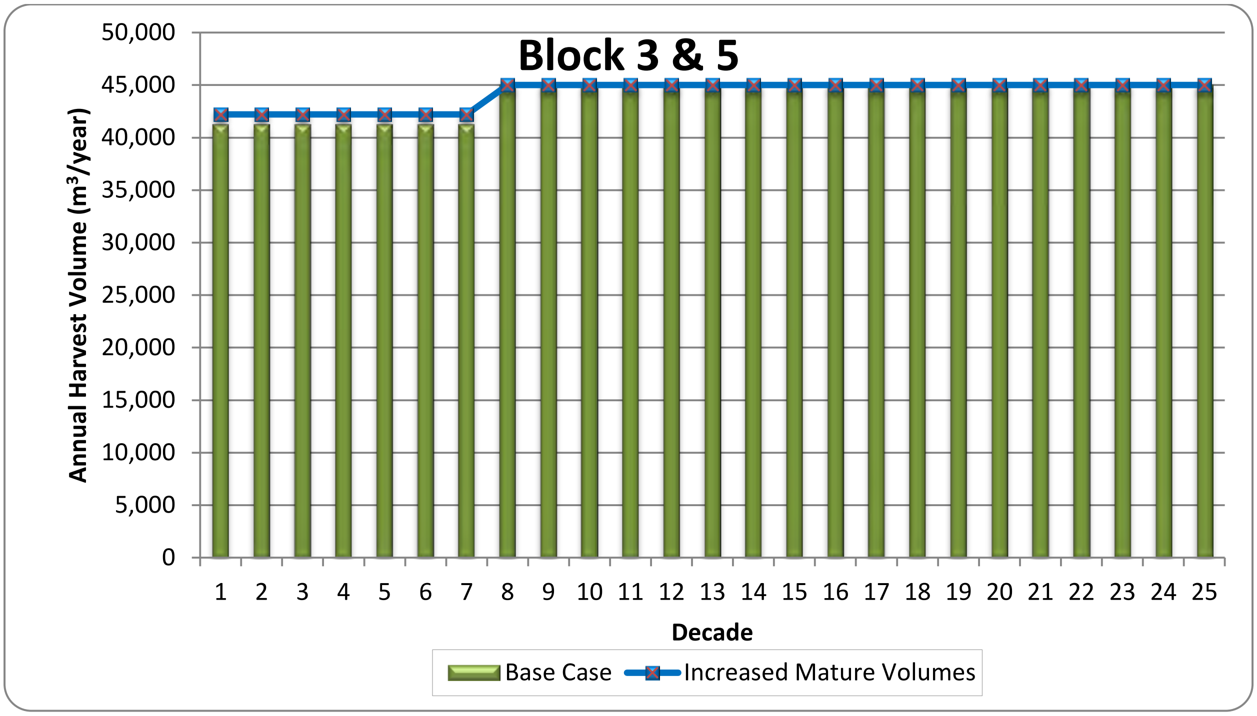

Figure 92 – Block 3&5 Harvest levels with mature volumes increased 10%

Appendix B5 – Mature Volumes Decreased by 10%

Reducing mature volumes by 10% reduces the harvest level in Block 1 by 500 m^3/year (0.1%). The impact is reduced due to the second growth harvest requirement and the constrained contribution from non-conventional stands.

Table 92 – Block 1 Harvest levels with mature volumes reduced 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Mature volumes reduced	Difference
1 - 25	2012	2261	435,300	434,800	- 500

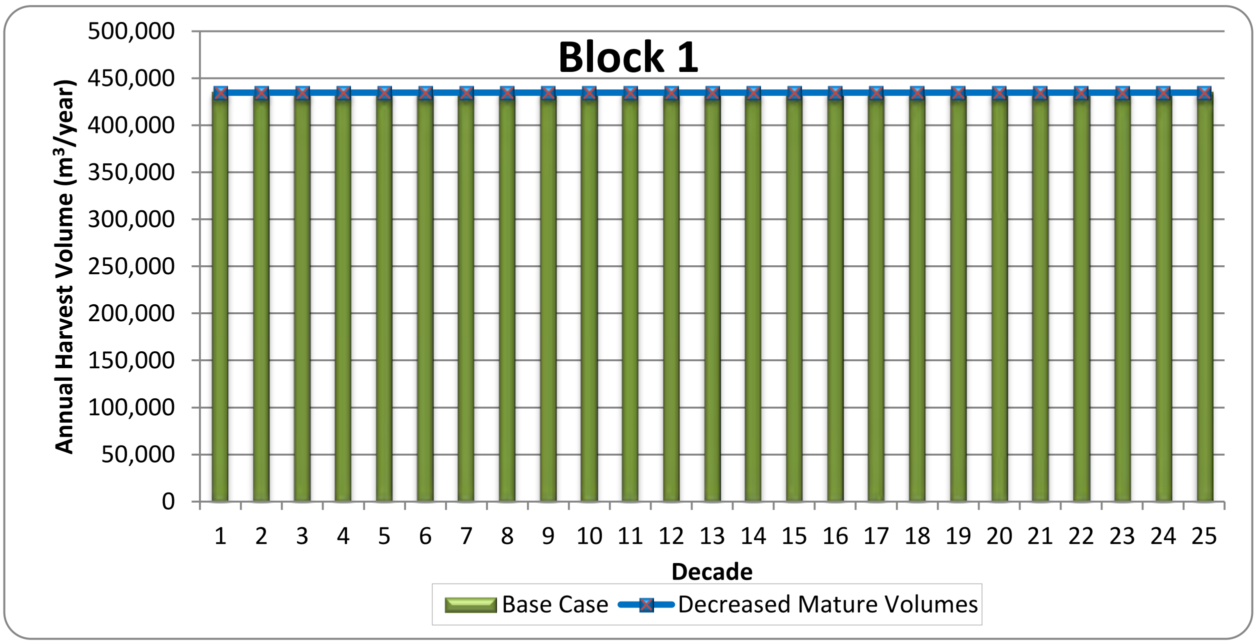

Figure 93 – Block 1 Harvest levels with mature volumes reduced 10%

Short-term timber supply from Block 2 is reduced by 5.7% when mature volumes are reduced by 10%. Mid-term supply is reduced by 1.5% and long-term is reduced by less than 0.1% (400 m^3/year). Total harvest is reduced by 1.55 million m^3 (0.8%). Instead of reducing short-term timber supply, the harvest in the first 20 years of the Base Case can be maintained by reducing the timber supply in the latter half of the mid-term and reducing the LTHL by 3,300 m^3/year (0.4%). Total harvest in this alternate schedule is 1.65 million m^3 (0.8%) less than the Base Case.

Table 93 – Block 2 Harvest levels with mature volumes reduced 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Mature volumes reduced	Difference	Alternate Mature volumes reduced	Difference
1	2012	2021	864,300	814,700	- 49,600	864,300	0
2	2022	2031	777,900	733,200	- 44,700	777,900	0
3 - 5	2032	2061	706,100	695,500	- 10,600	700,100	- 6,000
6	2062	2071	756,100	744,500	- 10,600	718,300	- 37,800
7	2072	2081	806,100	794,500	- 10,600	768,300	- 37,800
8	2082	2091	833,700	833,300	- 400	818,500	- 15,400
9 - 25	2092	2261	833,700	833,300	- 400	830,400	- 3,400

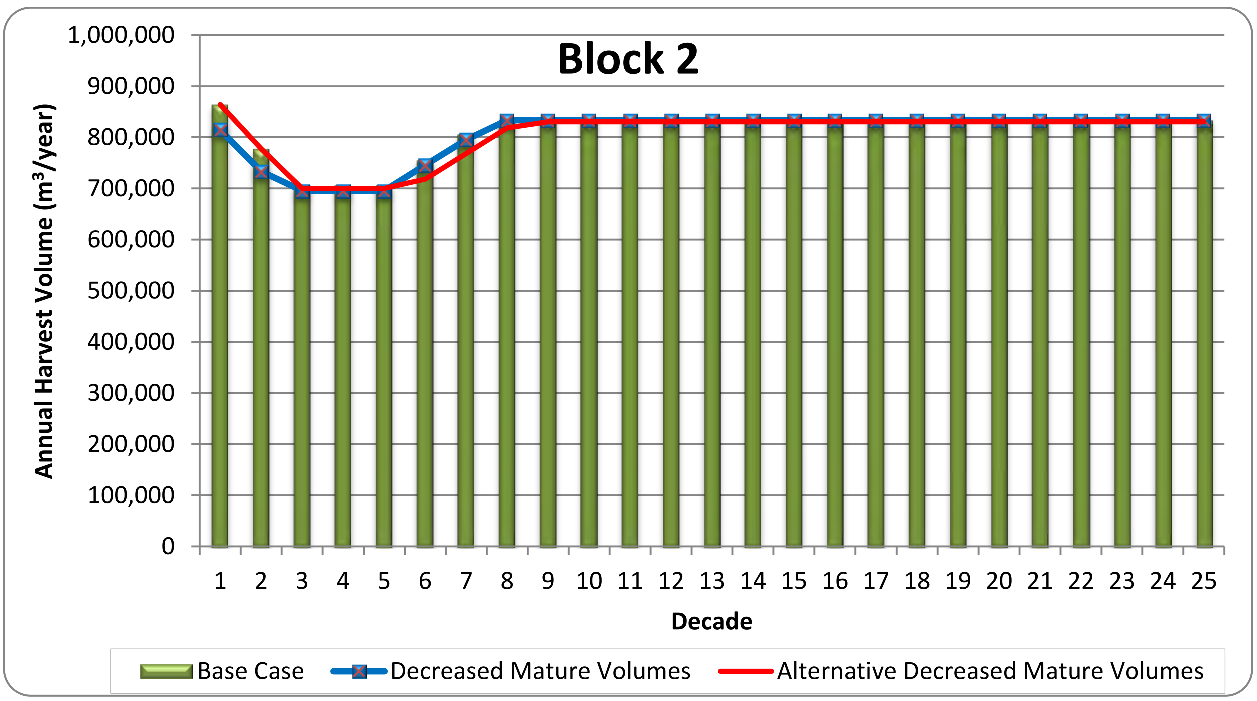

Figure 94 – Block 2 Harvest levels with mature volumes reduced 10%

Reducing volume estimates in mature stands within Block 4 by 10% results in the short-term harvest level being lessened by 5,700 m^3/year (2.9%) and mid-term harvest by 700 m^3/year (0.3%). Long-term harvest is unaffected and total harvest is reduced by 361,000 m^3 (0.6%). Alternatively, the initial harvest level of the Base Case can be achieved by delaying the transition to the mid-term harvest level by one decade with no change in the long-term harvest level or the total volume harvested.

Table 94 – Block 4 Harvest levels with mature volumes reduced 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Mature volumes reduced	Difference	Alternate Mature volumes reduced	Difference
1 - 4	2012	2051	197,000	191,300	- 5,700	197,000	0
5	2052	2061	216,700	210,500	- 6,200	199,000	- 17,700
6	2062	2071	237,300	231,500	- 5,800	218,900	- 18,400
7 - 10	2072	2111	237,300	236,600	- 700	236,900	- 400
11 - 25	2112	2261	249,900	250,000	+ 100	250,000	+ 100

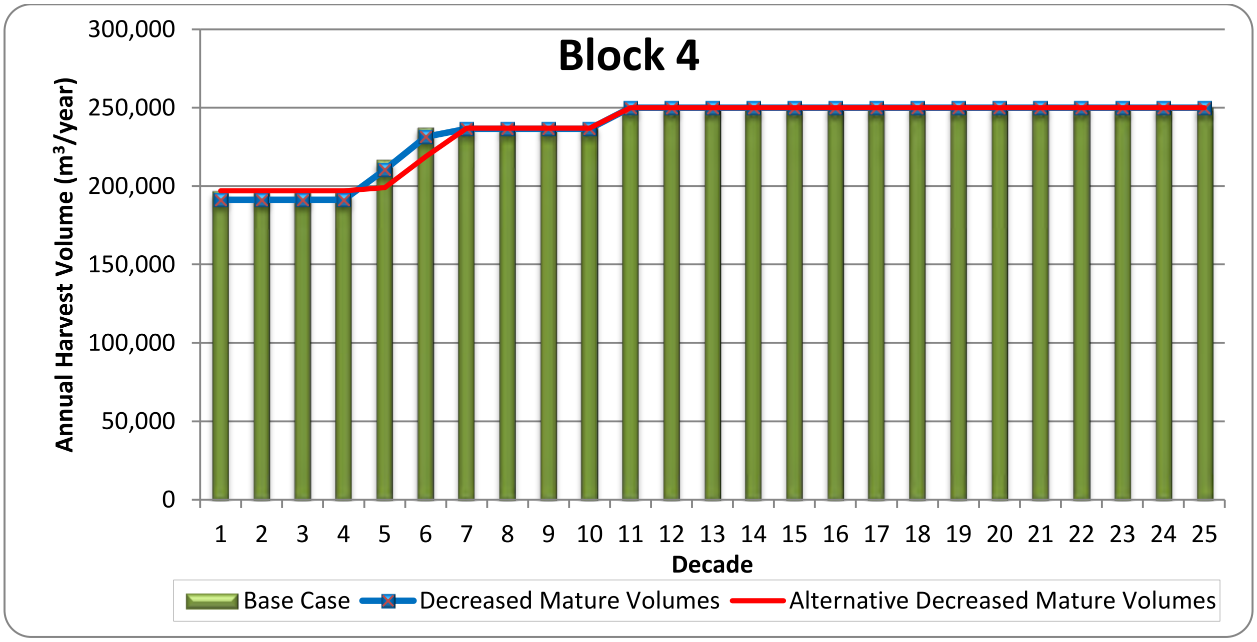

Figure 95 – Block 4 Harvest levels with mature volumes reduced 10%

Total timber supply within Blocks 3 and 5 (combined) is reduced by 56,000 m^3 (0.5%) when mature volumes are reduced by 10%. Short and mid-term harvest is reduced by 800 m^3/year (1.9%) and long-term is unaffected. An alternate schedule that maintains the initial harvest level of the Base Case is possible. This alternative reduces the balance of the short and mid-term harvest by 1,100 m^3/year (2.7%) and leaves the long-term unaffected. Total harvest is reduced by 66,000 m^3 (0.6%). These timber supply impacts are relatively minor due to the old seral requirements of EBM limiting the old forest within the THLB.

Table 95 – Block 3&5 Harvest levels with mature volumes reduced 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Mature volumes reduced	Difference	Alternate Mature volumes reduced	Difference
1	2012	2021	41,300	40,500	- 800	41,300	0
2 - 7	2022	2081	41,300	40,500	- 800	40,200	- 1,100
8 - 25	2082	2261	45,000	45,000	0	45,000	0

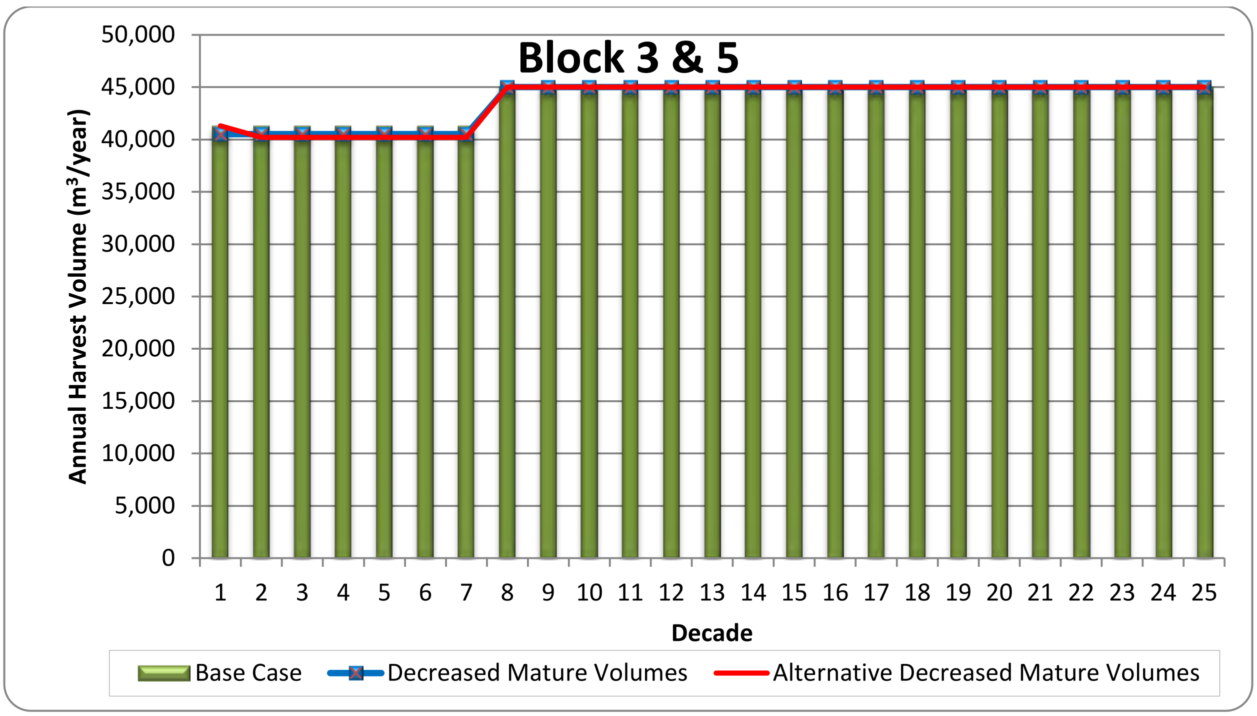

Figure 96 – Block 3&5 Harvest levels with mature volumes reduced 10%

Appendix B6 – Immature Volumes Increased by 10%

Since the Base Case for Block 1 requires that 80% of the initial harvest be sourced from immature stands (<141 years old), timber supply is sensitive to immature stands volume estimates. Increasing the volume estimates by 10% increases the harvest level by 9.0% (39,300 m^3/year).

Table 96 – Block 1 Harvest levels with immature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Immature volumes increased	Difference
1 - 25	2012	2261	435,300	474,600	+ 39,300

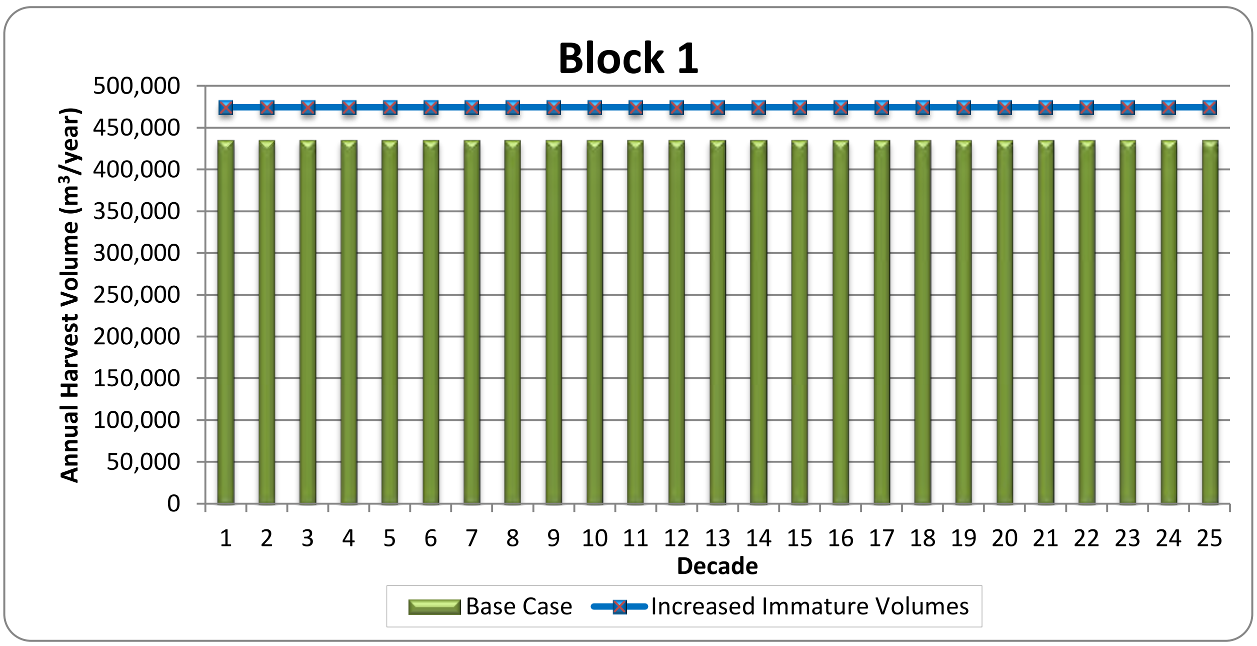

Figure 97 – Block 1 Harvest levels with immature volumes increased 10%

Higher immature yields increase short-term harvest in Block 2 by 2.9%, increase mid-term harvest by 70,100 m^3/year (average of 9.6%) and long-term by 81,600 m^3/year (9.8%). Total harvest is increased by 18.68 million m^3 (9.2%). A second schedule was developed that maintained the initial harvest level of the Base Case for Block 2 and increased mid-term timber supply by 78,700 m^3/year (average of 11%) and the long-term by 81,400 m^3/year (9.8%). Total harvest is 18.66 million m^3 (9.2%) higher. Long-term gain is not 10% in either schedule due to the constraint on non-conventional contribution partly nullifying gains within the non-conventional THLB.

Table 97 – Block 2 Harvest levels with immature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Immature volumes increased	Difference	Alternate Immature volumes increased	Difference
1	2012	2021	864,300	889,700	+ 25,400	864,300	0
2	2022	2031	777,900	800,700	+ 22,800	784,800	+ 6,900
3 - 5	2032	2061	706,100	776,200	+ 70,100	784,800	+ 78,700
6	2062	2071	756,100	826,200	+ 70,100	834,800	+ 78,700
7	2072	2081	806,100	876,200	+ 70,100	884,800	+ 78,700
8 - 25	2082	2261	833,700	915,300	+ 81,600	915,100	+ 81,400

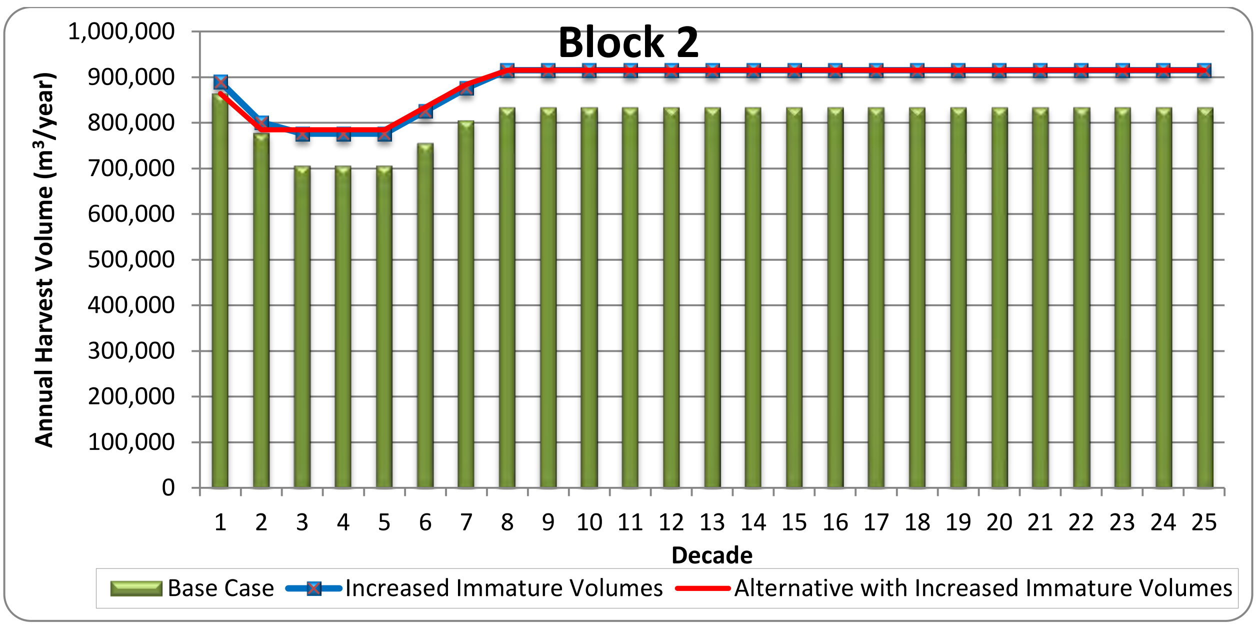

Figure 98 – Block 2 Harvest levels with immature volumes increased 10%

Increasing immature yields by 10% allows the short-term harvest in Block 4 to be 13,200 m^3/year (6.7%) higher and long-term greater by 25,300 m^3/year (10.1%). Total harvest is improved by 5.61 million m^3 (9.4%).

Table 98 – Block 4 Harvest levels with immature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Immature volumes increased	Difference
1 - 4	2012	2051	197,000	210,200	+ 13,200
5	2052	2061	216,700	231,200	+ 14,500
6	2062	2071	237,300	254,300	+ 17,000
7 - 10	2072	2111	237,300	261,600	+ 24,300
11 - 25	2112	2261	249,900	275,200	+ 25,300

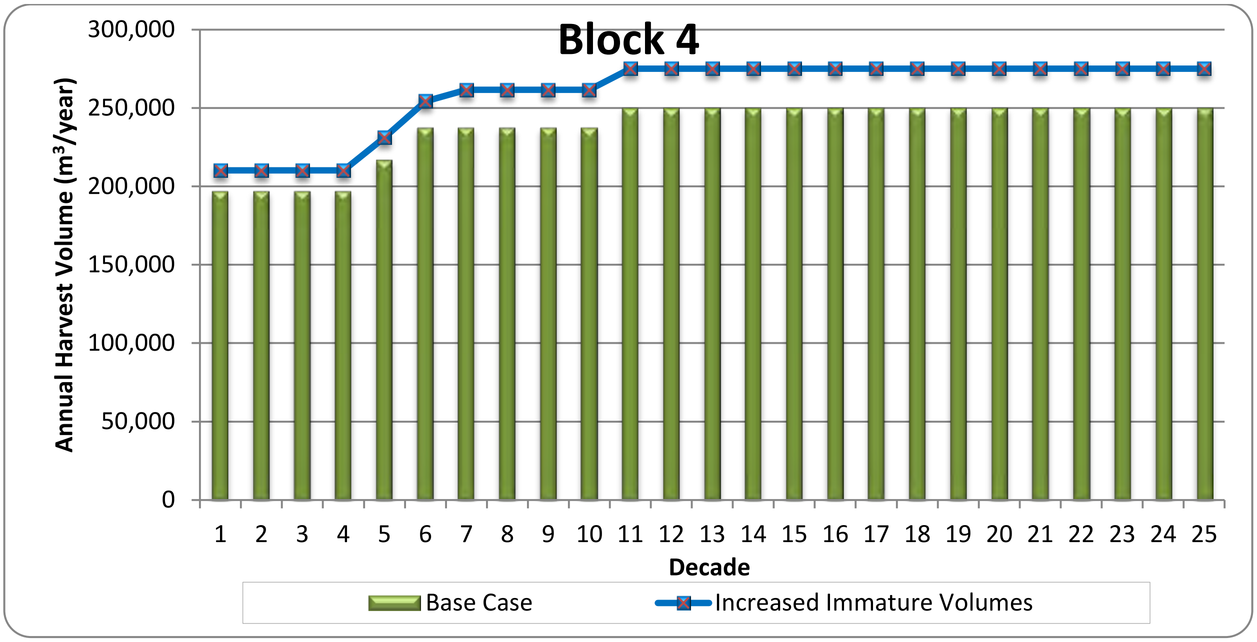

Figure 99 – Block 4 Harvest levels with immature volumes increased 10%

The short and mid-term timber supply from Block 3 and 5 combined can be increased by 2,800 m^3/year (6.8%) with immature yields increased by 10%. The long-term harvest is increased by 4,200 m^3/year (9.3%) and total harvest by 951,000 m^3 (8.7%).

Table 99 – Block 3&5 Harvest levels with immature volumes increased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Immature volumes increased	Difference
1 – 7	2012	2281	41,300	44,100	+ 2,800
8 - 25	2082	2261	45,000	49,200	+ 4,200

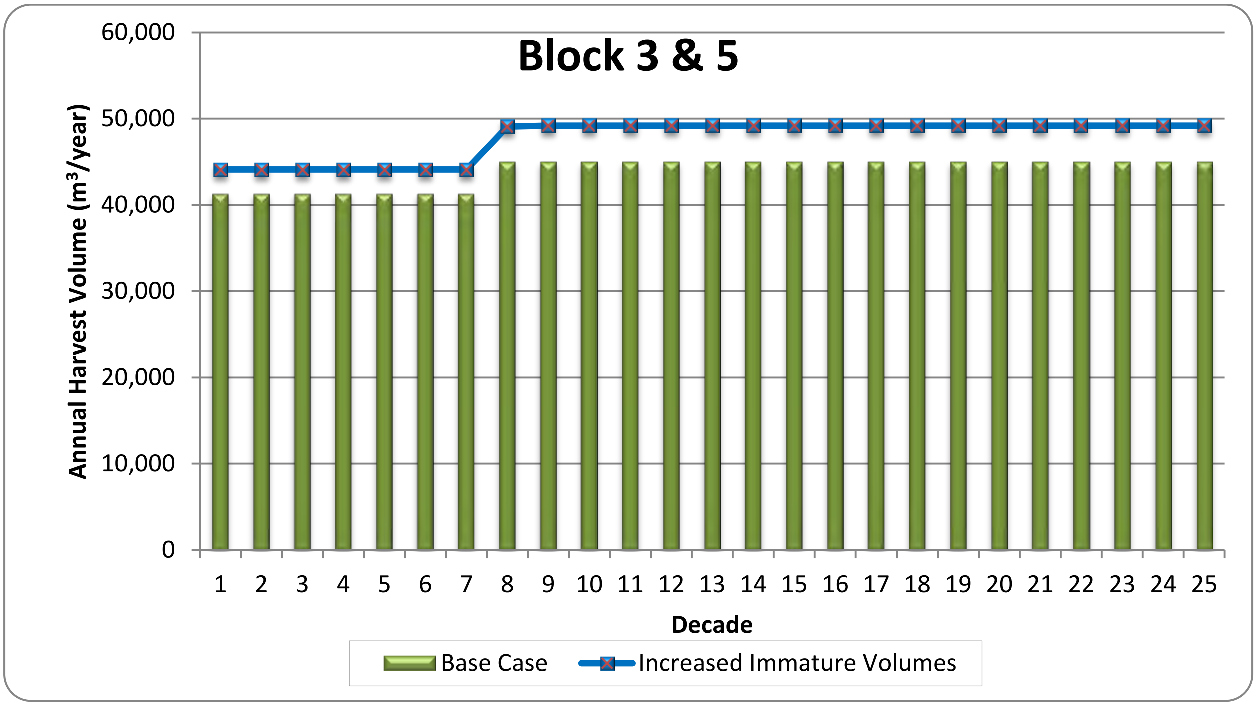

Figure 100 – Block 3&5 Harvest levels with immature volumes increased 10%

Appendix B7 – Immature Volumes Decreased by 10%

Reducing immature yields by 10% lessens timber supply from Block 1 by 39,900 m^3/year (9.2%). As the schedule is a non-declining even-flow this is also the percentage impact to total harvest (or 9.98 million m^3). Alternatively, the initial harvest level of the Base Case can be achieved for 20 years and then harvest declines to 393,000 m^3/year – a reduction of 42,300 m^3/year (9.7%). Total harvest in this alternate schedule is 9.76 million m^3 (9.0%) less than the Base Case.

Table 100 – Block 1 Harvest levels with immature volumes decreased 10%

			Annual Harvest Volume (m^3)				
Period (Decade #)	Start Year	End Year	Base Case	Immature volumes decreased	Difference	Alternate Immature volumes decreased	Difference
1 - 2	2012	2031	435,300	395,400	- 39,900	435,300	0
3 - 25	2032	2261	435,300	395,400	- 39,900	392,400	- 42,900

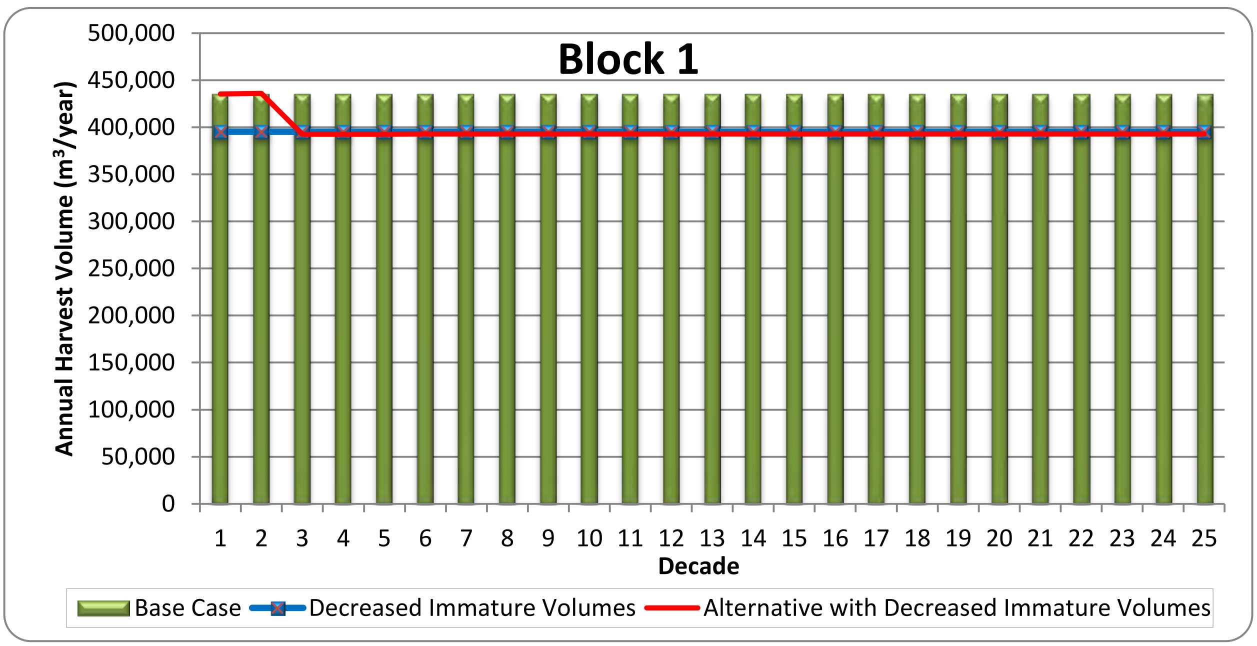

Figure 101 – Block 1 Harvest levels with immature volumes decreased 10%

Lower immature yields decrease short-term harvest in Block 2 by 6.6%, decrease mid-term harvest by 52,400 m^3/year (average of 7.3%) and long-term by 86,000 m^3/year (10.3%). Total harvest is decreased by 19.25 million m^3 (9.5%). A second schedule was developed that maintained the initial harvest level of the Base Case for Block 2, increased the lowest harvest level by 46,400 m^3/year (7.1%) but extended the length of time the lowest harvest level applied by 50 years and decreased the long-term by a further 7,800 m^3/year (1.0%). Total harvest is 18.82 million m^3 (9.7%) less. Long-term loss is slightly greater than 10% due to maintaining higher short and mid-term harvest levels (when natural and current managed second growth stands contribute the largest proportion of timber supply) causing a further reduction to long-term growing stock.

Table 101 – Block 2 Harvest levels with immature volumes decreased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Immature volumes decreased	Difference	Alternate Immature volumes decreased	Difference
1	2012	2021	864,300	807,100	- 57,200	864,300	0
2	2022	2031	777,900	726,400	- 51,500	777,900	0
3 - 5	2032	2061	706,100	653,700	- 52,400	700,100	- 6,000
6	2062	2071	756,100	703,700	- 58,400	700,100	- 56,000
7	2072	2081	806,100	747,700	- 86,000	700,100	- 106,000
8 - 9	2082	2101	833,700	747,700	- 86,000	700,100	- 133,600
10	2102	2111	833,700	747,700	- 86,000	706,400	- 127,300
11 - 25	2112	2261	833,700	747,700	- 86,000	739,900	- 93,800

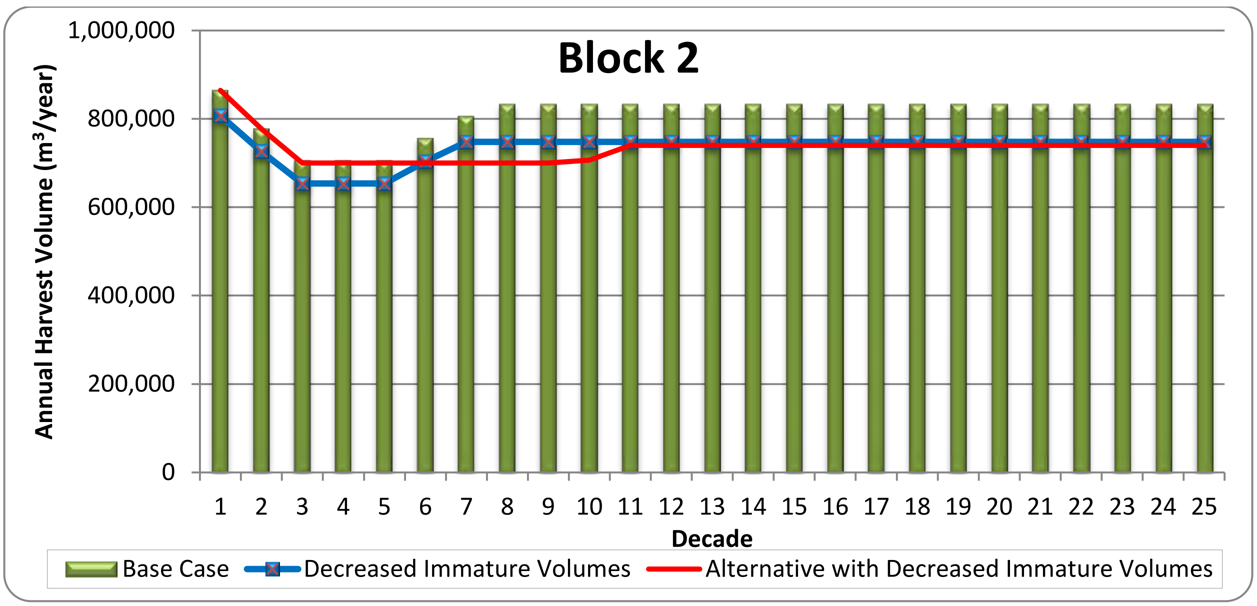

Figure 102 – Block 2 Harvest levels with immature volumes decreased 10%

Decreasing immature yields by 10% reduces the short-term harvest in Block 4 by 12,200 m^3/year (6.2%), mid-term harvest by 23,500 m^3/year (9.9%) and long-term by 25,700 m^3/year (10.3%). Total harvest is decreased by 5.65 million m^3 (9.5%). Maintaining the initial harvest level of the Base Case for Block 4 is feasible by extending the length of time it applies by 20 years, thus reducing mid-term timber supply, and reducing the mid-term harvest level by 30,300 m^3/year (12.8%). In this schedule, the long-term harvest level is 25,600 m^3/year (10.2%) less than the Base Case and total harvest is 5.65 million m^3 (9.5%) lower. Like Block 2, long-term harvest is decreased by more than 10% as a result of lowered growing stock levels resulting from relatively higher short-term harvest.

Table 102 – Block 4 Harvest levels with immature volumes decreased 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Immature volumes reduced	Difference	Alternate Immature volumes reduced	Difference
1 - 4	2012	2051	197,000	184,800	- 12,200	197,000	0
5	2052	2061	216,700	203,200	- 13,500	197,000	- 19,700
6	2062	2071	237,300	213,800	- 23,500	197,000	- 40,300
7 - 10	2072	2111	237,300	213,800	- 23,500	207,000	- 30,300
11 - 25	2112	2261	249,900	224,200	- 25,700	224,300	- 25,600

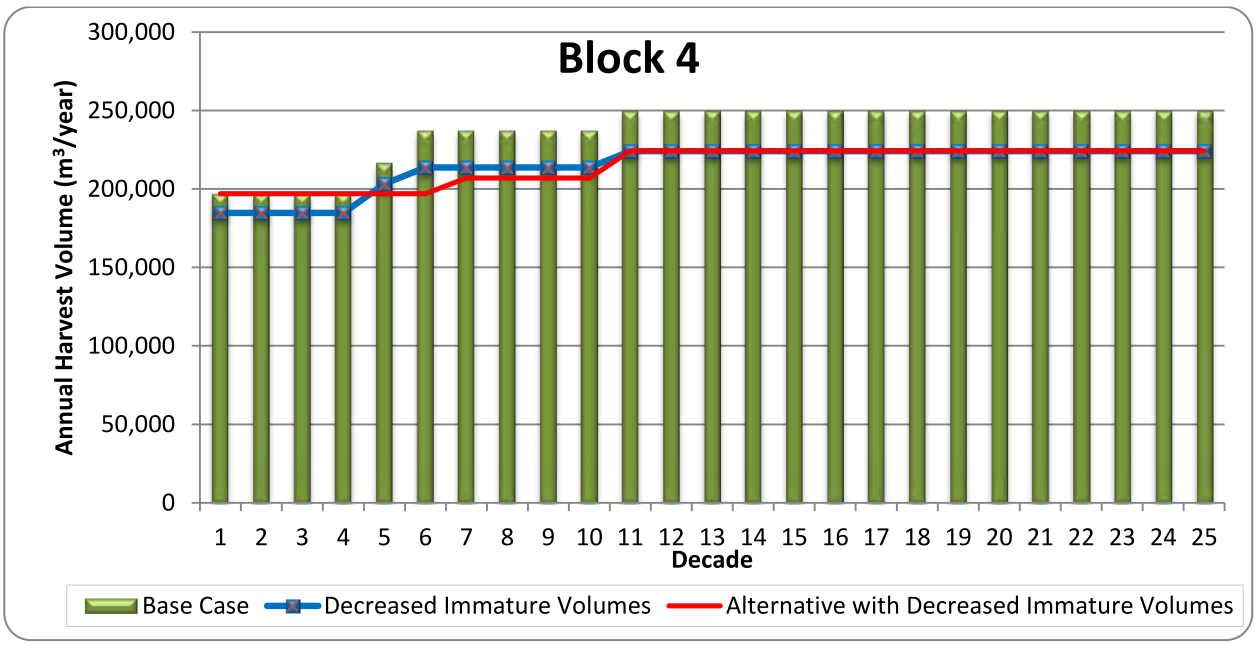

Figure 103 – Block 4 Harvest levels with immature volumes decreased 10%

Short and mid-term harvest from Blocks 3 and 5 is reduced by 2,700 m^3/year (6.5%) when immature yields area reduced by 10%. Long-term is reduced by 4,300 m^3/year (9.6%) and total volume harvested is 963,000 m^3 less. Alternatively, the initial harvest level of the Base Case can be achieved if mid-term timber supply is reduced by 3,700 m3/year (9.0%). This alternate schedule achieves a LTHL of 40,800 m^3/year – a reduction of 4,200 m^3/year (9.3%) from the Base Case – and a total harvest 978,000 m^3 (8.9%) less than the Base Case.

Table 103 – Block 3&5 Harvest levels with immature volumes reduced 10%

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Immature volumes reduced	Difference	Alternate Immature volumes reduced	Difference
1	2012	2021	41,300	38,600	- 2,700	41,300	0
2 - 7	2022	2081	41,300	38,600	- 2,700	37,600	- 3,700
8 - 25	2082	2261	45,000	40,700	- 4,300	40,800	- 4,200

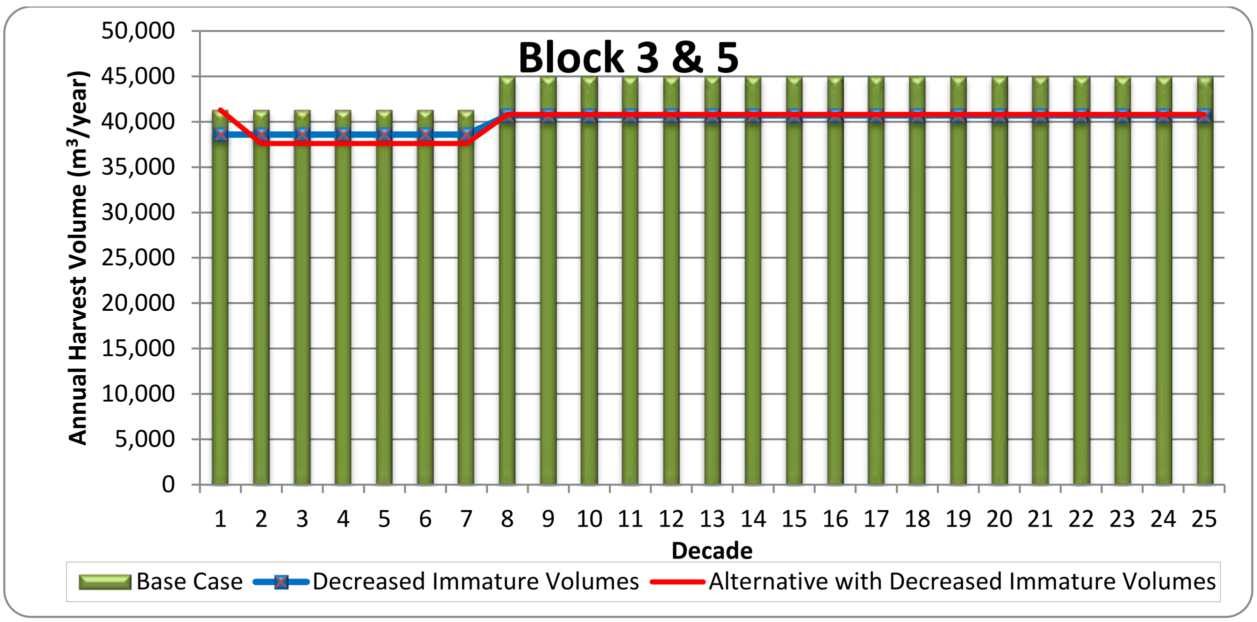

Figure 104 – Block 3&5 Harvest levels with immature volumes decreased 10%

Appendix B8 – Use SIBEC Site Index Estimates

Using SIBEC site index estimates based on the TFL 39 terrestrial ecosystem mapping (TEM) increases the Block 1 THLB growing stock by 1.5 million m^3 (6.7%) of which 0.9 million m^3 is within the areas "locked" to address green-up and adjacency in the opening forest conditions. The net gain of 0.6 million m^3 (2.7%) includes volume within the constrained non-conventional landbase. After accounting for all these constraints there is not enough additional operable inventory to increase timber supply so harvest level is unchanged.

Table 104 – Block 1 Harvest levels with SIBEC-based yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	SIBEC-based yields	Difference
1 - 25	2012	2261	435,300	435,300	0

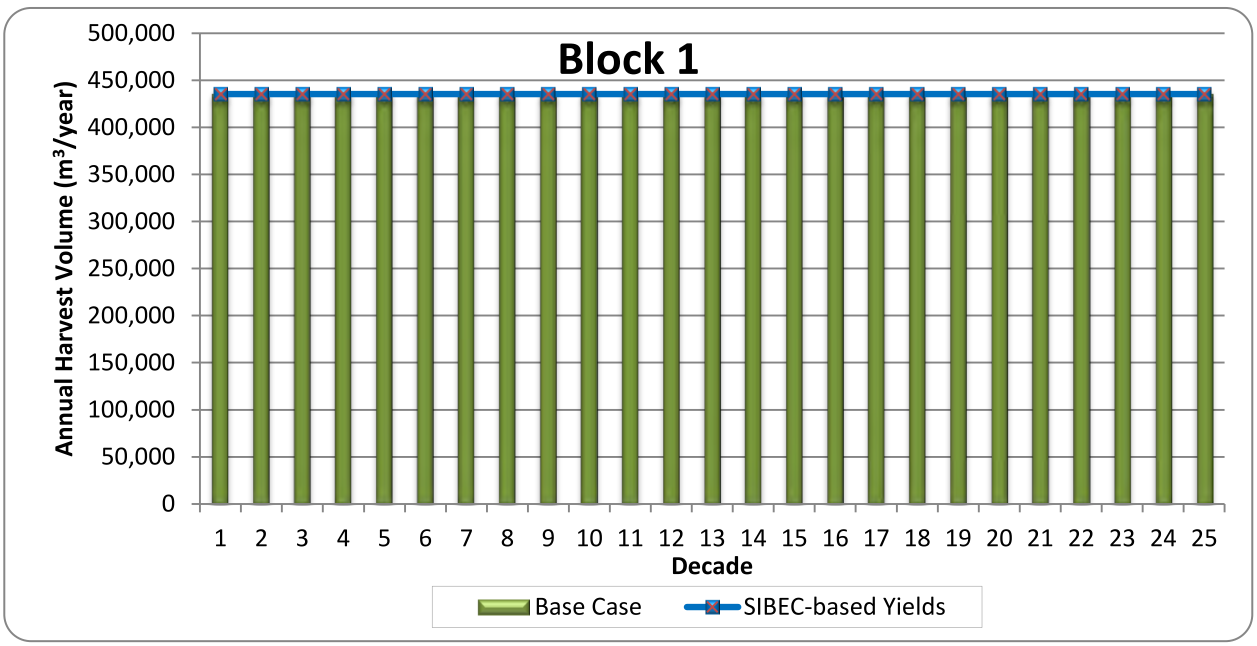

Figure 105 – Block 1 Harvest levels with SIBEC-based yields

Applying SIBEC within Block 2 increases the THLB growing stock by 203,400 m^3 (0.6%); however, "available" inventory (meets minimum harvest criteria) is reduced by 83,700 m^3 (0.4%). Yields from managed second growth is improved by about 5% allowing mid and long-term harvest levels to increase by about 8% and 4% respectively. Total volume is maximized (8.33 million m^3 (4.1%) more than in Base Case) by reducing the initial harvest level by 34,000 m^3/year (3.9%). Alternatively the initial harvest level from the Base Case can be maintained by reducing mid-term timber supply gains to about 7% (rather than 8%), with no impact to long-term harvest. Total volume harvested in this alternate schedule is 8.32 million m^3 (4.1%) more than the Base Case.

Table 105 – Block 2 Harvest levels with SIBEC-based yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	SIBEC-based yields	Difference	Alternate SIBEC-based yields	Difference
1	2012	2021	864,300	830,300	- 34,000	864,300	0
2	2022	2031	777,900	763,900	- 14,000	777,900	0
3 - 5	2032	2061	706,100	763,900	+ 57,800	754,700	+ 48,600
6	2062	2071	756,100	813,900	+ 57,800	804,700	+ 48,600
7	2072	2081	806,100	863,900	+ 57,800	854,700	+ 48,600
8 - 25	2082	2261	833,700	866,600	+ 32,900	866,400	+ 32,700

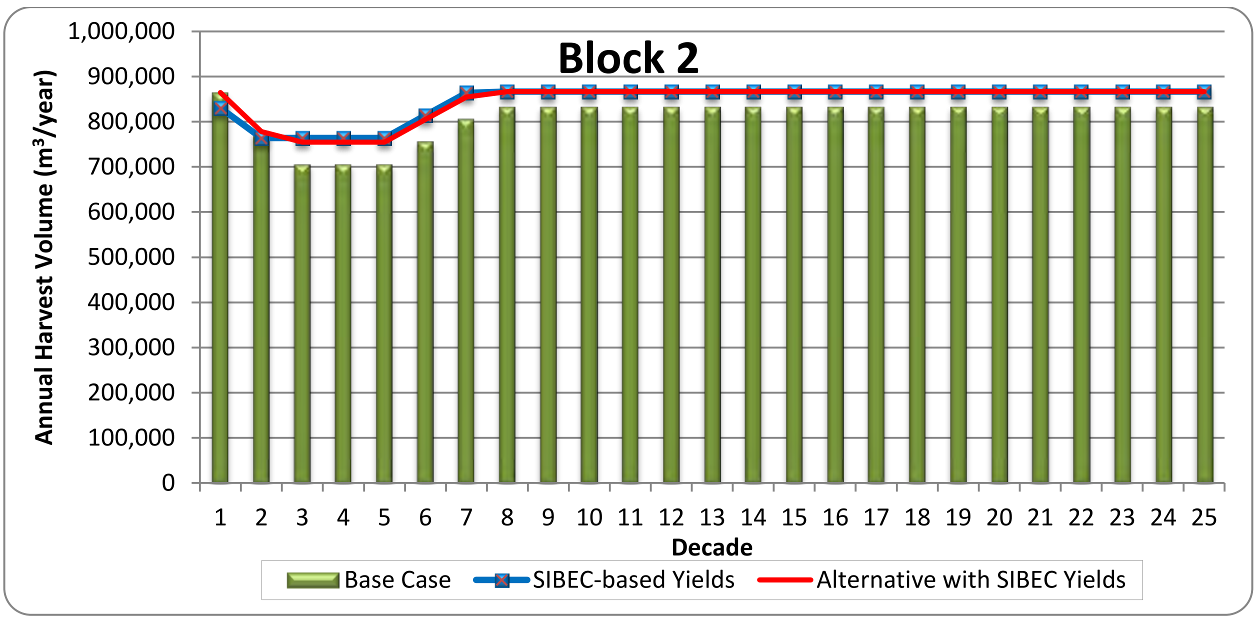

Figure 106 – Block 2 Harvest levels with SIBEC-based yields

Applying SIBEC within Block 4 decreases the initial THLB growing stock by 101,700 m^3 (1.1%); however, “available” inventory is increased by 272,000 m^3 (6.3%). The increase in “available” inventory allows the transition to a slightly reduced (300 m^3/year lower (0.1%)) mid-term harvest level to occur 10 years earlier than in the Base Case. Long-term harvest is increased by 6,500 m^3/year and total harvest is 1.19 million m^3 higher.

Table 106 – Block 4 Harvest levels with SIBEC-based yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	SIBEC-based yields	Difference
1 - 3	2012	2041	197,000	197,000	0
4	2042	2051	197,000	207,900	+ 10,900
5	2052	2061	216,700	228,700	+ 12,000
6 - 10	2062	2111	237,300	237,000	- 300
11 - 25	2112	2261	249,900	256,400	+ 6,500

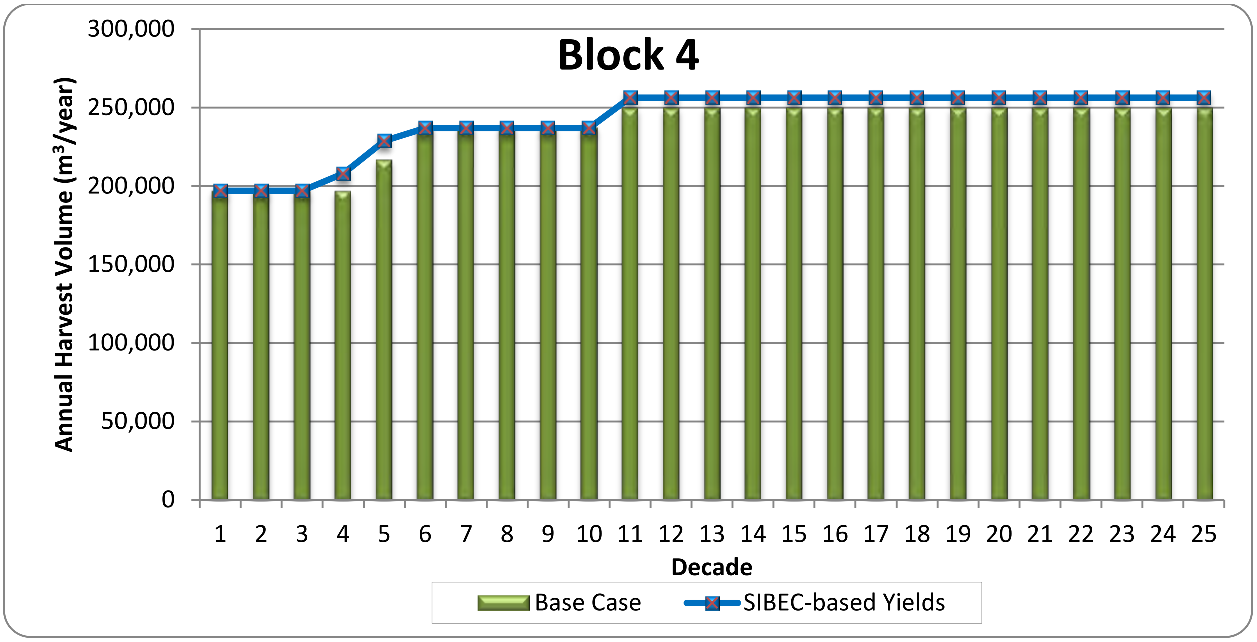

Figure 107 – Block 4 Harvest levels with SIBEC-based yields

Using SIBEC estimates in Blocks 3 and 5 reduces the opening THLB growing stock by 182,200 m^3 (9.7%) and the "available" growing stock by 221,300 m^3 (17.2%). The reduced inventory lowers short and mid-term timber supply by 4,000 m^3/year (9.7%) and long-term supply by 1,300 m^3/year (2.9%). The long-term impact is mitigated by the reduced short and mid-term harvest and total harvest is 528,000 m3 (4.8%) less than the Base Case.

It is possible to devise a schedule that achieves the same initial harvest level as the Base Case. This schedule requires mid-term timber supply to be 6,200 m^3/year (15%) less than the Base Case and achieves the same LTHL as the schedule discussed above. Total harvest is 604,000 m^3 (5.5%) lower than the Base Case.

Table 107 – Block 3&5 Harvest levels with SIBEC-based yields

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	SIBEC-based yields	Difference	Alternate SIBEC-based yields	Difference
1	2012	2021	41,300	37,300	- 4,000	41,300	0
2	2022	**2031**	41,300	37,300	- 4,000	37,200	- 4,100
3 - 7	2032	2081	41,300	37,300	- 4,000	35,100	- 6,200
8	2082	2091	45,000	42,300	- 2,700	40,100	- 4,900
9 - 25	2092	2261	45,000	43,700	- 1,300	43,800	- 1,200

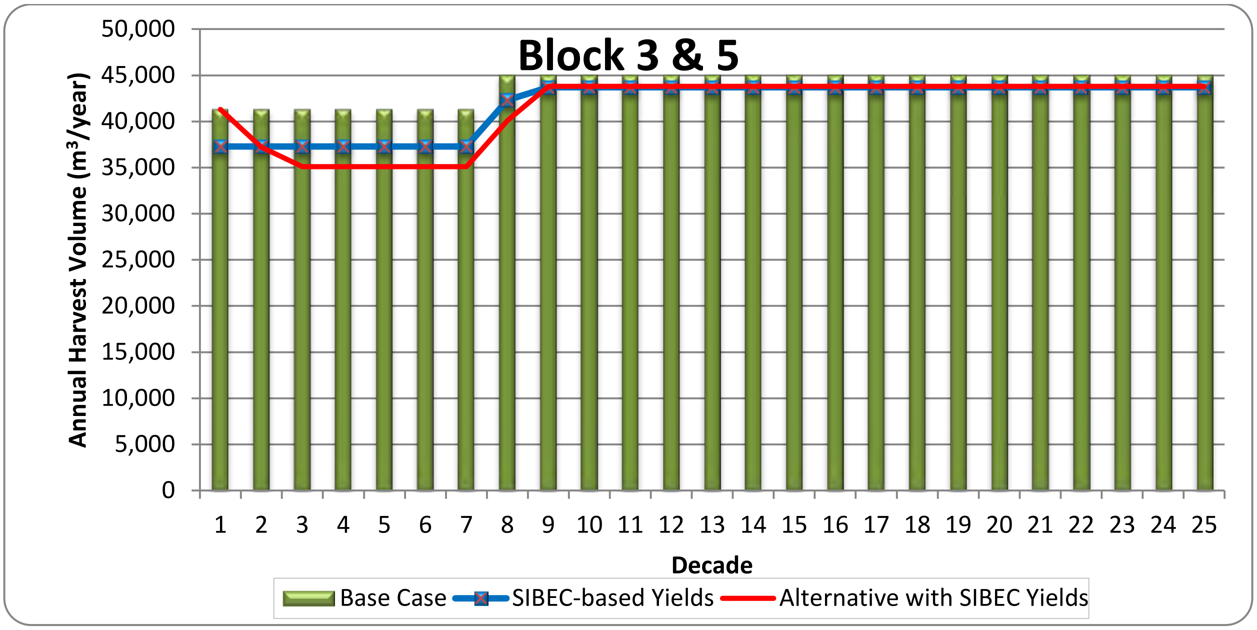

Figure 108 – Block 3&5 Harvest levels with SIBEC-based yields

Appendix B9 – Increased OAF2 for Unmanaged Immature Stands

Short and mid-term timber supply from Block 1 is dependent on contribution from stands currently aged between 51 and 140 years as roughly 60% of the THLB volume is in this age group (refer to Appendix B of the Information Package). Increasing OAF2 by 10% for these stands reduces the total THLB volume by 1.58 million m^3 (7.1%) and the available growing stock by 880,000 m^3 (7.7%). The reduced operable inventory drives short and mid-term harvest levels to be reduced by 20,400 m^3/year (4.7%) and long-term by 9,200 m3/year (2.1%). Total volume harvested is lowered by 2.97 million m^3 (2.7%). Alternatively, the initial harvest level of the Base Case can be achieved by reducing mid-term timber supply by 24,500 m^3/year (5.6%). Long-term harvest is 9,000 m^3/year (2.1%) lower in this alternate schedule and total harvest is reduced by 2.94 million m^3 (2.7%).

Table 108 – Block 1 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Increased OAF2	Difference	Alternate Increased OAF2	Difference
1	2012	2021	435,300	414,900	- 20,400	435,300	0
2 - 7	2022	2081	435,300	414,900	- 20,400	410,800	- 24,500
8 - 25	2082	2261	435,300	426,100	- 9,200	426,300	- 9,000

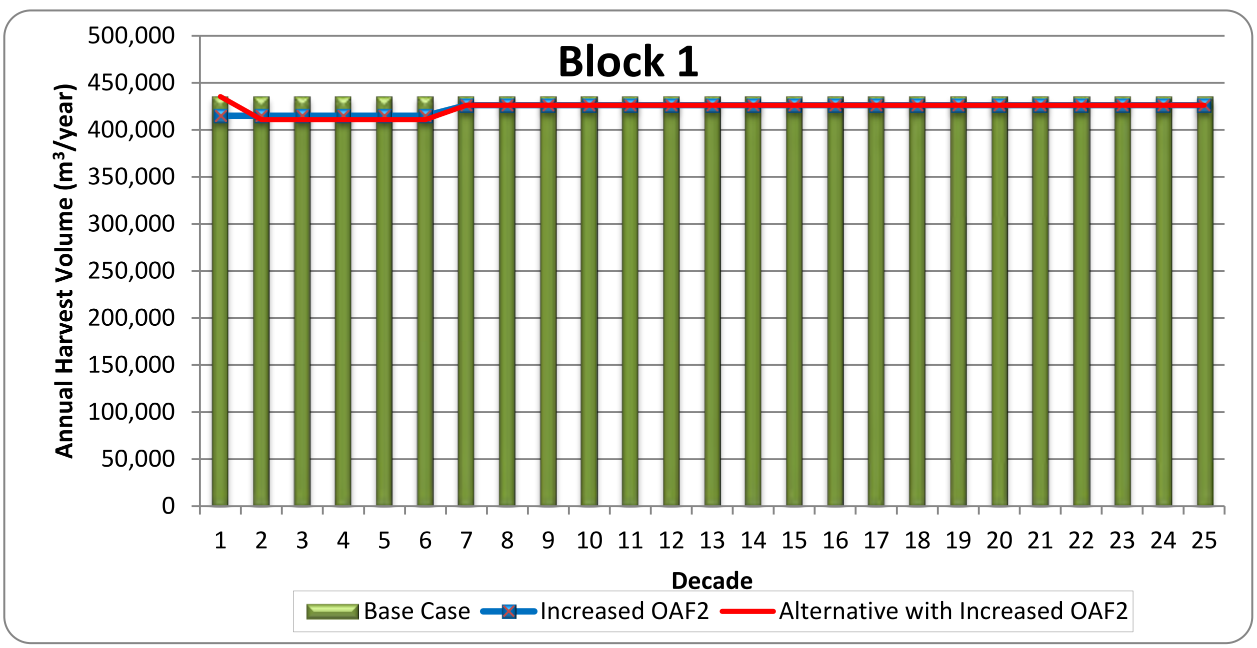

Figure 109 – Block 1 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Block 2 timber supply is less dependent on the 51-140 age group so increasing OAF2 by 10% for these stands has a minor timber supply impact. Harvest levels for the first 20 years are unchanged, reduced by 6,000 m^3/year (0.8%) for the next 50 years and reduced by 6,900 m^3/year

(0.8%) thereafter. Total harvest is reduced by 1.54 million m^3 (0.8%).

Table 109 – Block 2 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Increased OAF2	Difference
1	2012	2021	864,300	864,300	0
2	2022	2031	777,900	777,900	0
3 - 5	2032	2061	706,100	700,100	- 6,000
6	2062	2071	756,100	750,100	- 6,000
7	2072	2081	806,100	800,100	- 6,000
8 - 25	2082	2261	833,700	826,800	- 6,900

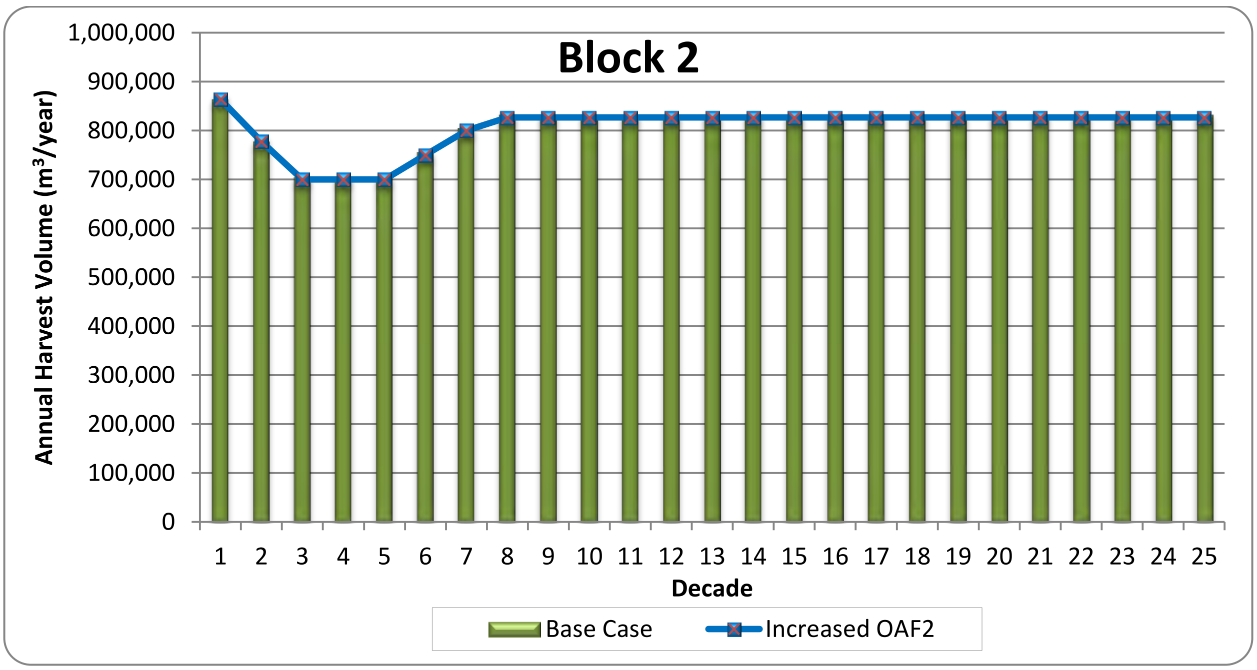

Figure 110 – Block 2 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Increasing OAF2 by 10% for 51-140 year old stands decreases Block 4 timber supply in Decade 5 and 6 by 11,300 m^3/year (~ 5%), in Decades 7 – 10 by 700 m^3/year (0.3%) and LTHL by 200 m^3/year (0.1%). Total harvest is reduced by 284,000 m^3 (0.5%). Short-term harvest is unchanged.

Table 110 - Block 4 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Increased OAF2	Difference
1 - 4	2012	2051	197,000	197,000	0
5	2052	2061	216,700	205,400	- 11,300
6	2062	2071	237,300	226,000	- 11,300
7 - 10	2072	2111	237,300	236,600	- 700
11 - 25	2112	2261	249,900	249,700	- 200

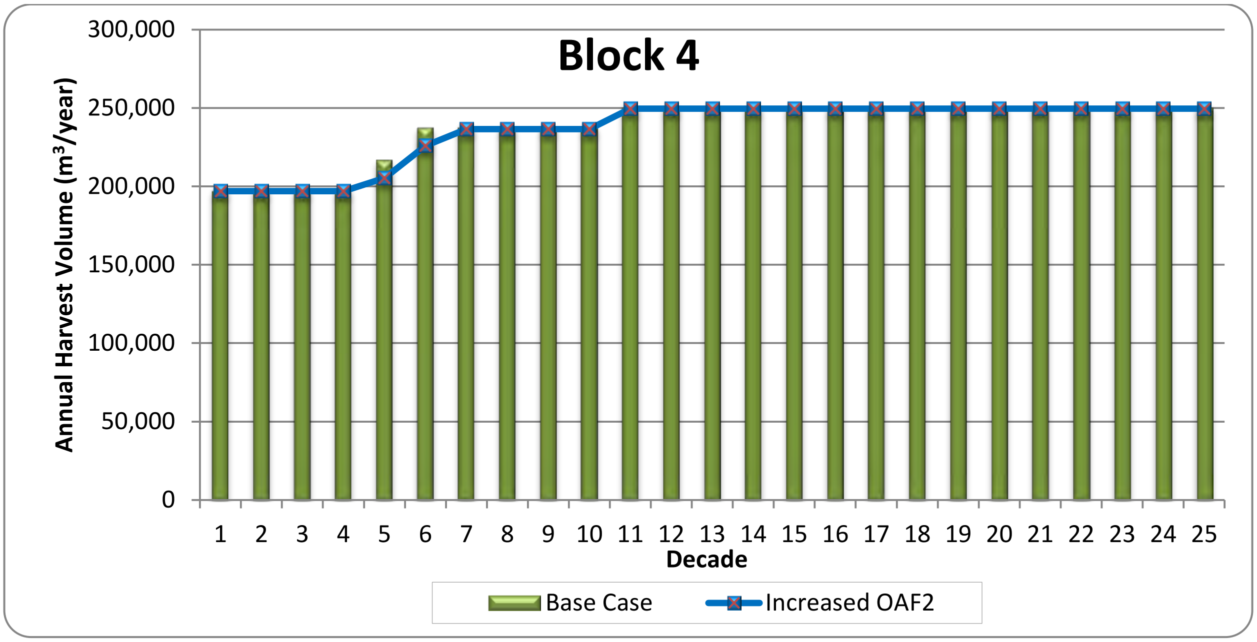

Figure 111 – Block 4 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Short and mid-term timber supply from Block 3 and 5 (combined) is reduced by 1,400 m^3/year (3.4%) when OAF2 for 51-140 year old stands is increased by 10%. Long-term harvest is decreased by 100 m^3/year (0.2%) and total harvest is lowered by 116,000 m^3 (1.1%). It is possible to achieve the initial harvest of the Base Case by reducing mid-term harvest by 1,900 m^3/year (4.6%). Long-term harvest is again 100 m^3/year lower and total harvest is 137,000 m^3 (1.2%) less.

Table 111 – Block 3&5 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Increased OAF2	Difference	Alternate Increased OAF2	Difference
1	2012	2021	41,300	39,900	- 1,400	41,300	0
2 - 7	2022	2081	41,300	39,900	- 1,400	39,400	- 1,900
8	2082	2091	45,000	44,900	- 100	44,400	- 600
9 - 25	2092	2261	45,000	44,900	- 100	43,000	- 100

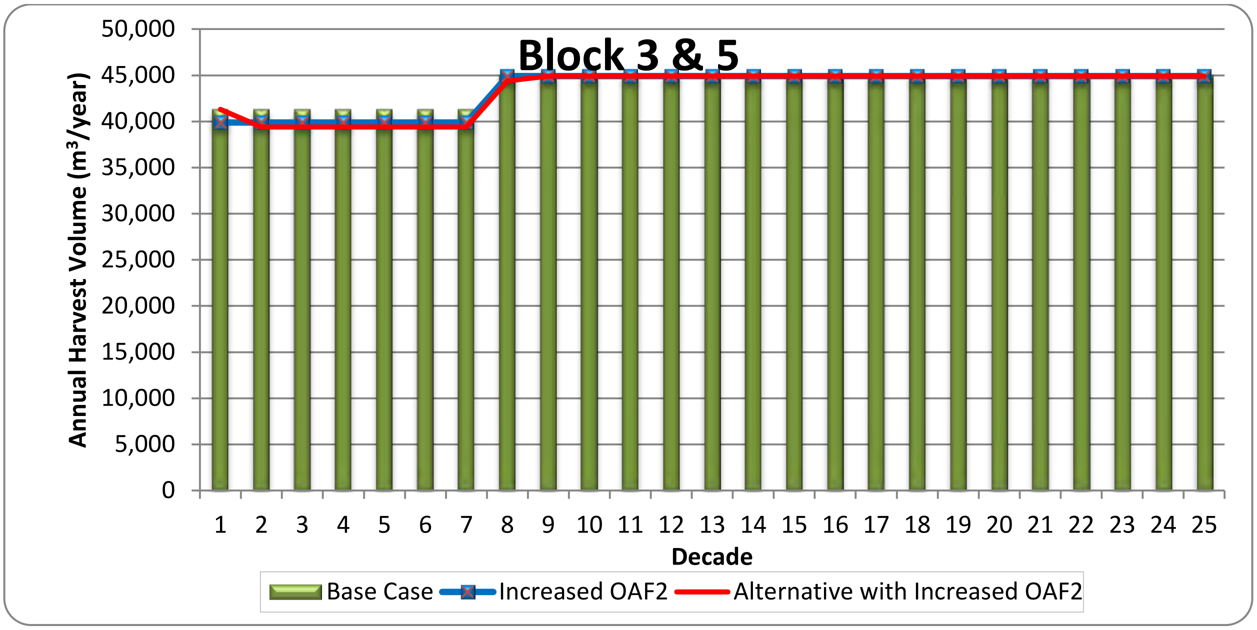

Figure 112 – Block 3&5 Harvest levels with Increased OAF2 for Unmanaged Immature Stands

Appendix B10 – No Future Genetic Gain (Worth)

Eliminating yield gains due to genetic worth values applied to all future stands reduces timber supply from Block 1 by 20,700 m^3/year (4.8%) beginning in the sixth decade. Total harvest is reduced by 4.14 million m^3 (3.8%).

Table 112 – Block 1 Harvest levels with no Future Genetic Worth

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1 - 5	2012	2061	435,300	435,300	0
6 - 25	2062	2261	435,300	414,600	- 20,700

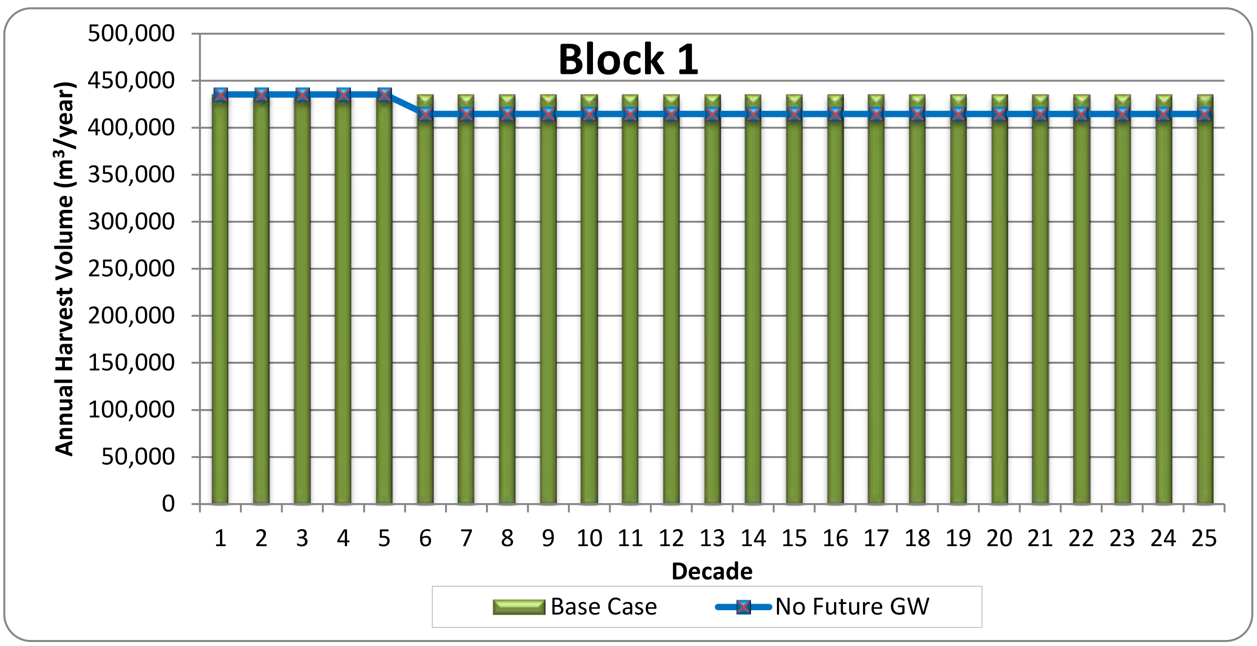

Figure 113 – Block 1 Harvest levels with no Future Genetic Worth

Eliminating genetic gain from future stands within Block 2 reduces the LTHL by 19,900 m^3/year (2.4%). The transition to this lower LTHL begins in Decades 3 – 5 when harvest is 6,000 m^3/year (0.8%) lower. Total harvest is 4.25 million m^3 (2.1%) less.

Table 113 – Block 2 Harvest levels with no Future Genetic Worth

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1	2012	2021	864,300	864,300	0
2	2022	2031	777,900	777,900	0
3 - 5	2032	2061	706,100	700,100	- 6,000
6	2062	2071	756,100	731,800	- 24,300
7	2072	2081	806,100	781,800	- 24,300
8 - 25	2082	2261	833,700	813,800	- 9,000

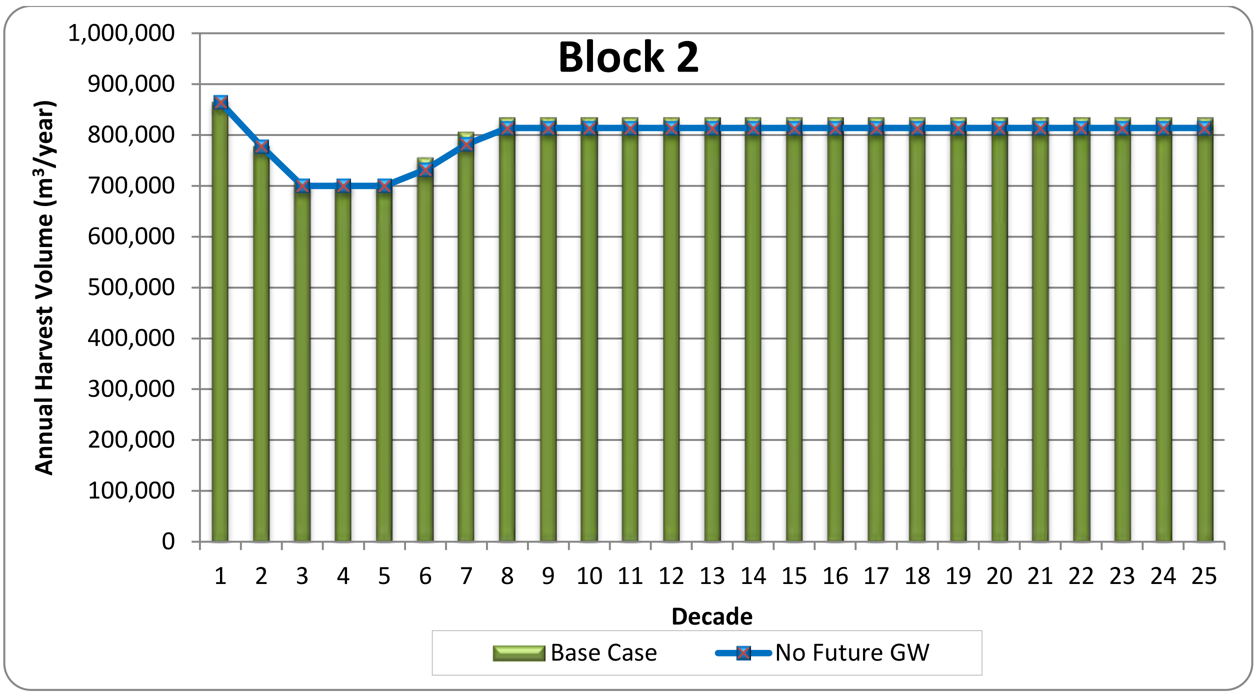

Figure 114 – Block 2 Harvest levels with no Future Genetic Worth

Short-term harvest within Block 4 is unaffected by assuming no genetic gain in future stands. Mid-term harvest levels are reduced by 11,400 m^3/year (4.8%) due to less THLB growing stock. The reduced mid-term harvest allows the long-term harvest to somewhat recover such that it is lower by 9,000 m^3/year (3.6%). Total harvest is 2.03 million m^3 (3.4%) less.

Table 114 - Block 4 Harvest levels with no Future Genetic Worth

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1 - 4	2012	2051	197,000	197,000	0
5	2052	2061	216,700	205,400	- 11,300
6 - 10	2062	2111	237,300	225,900	- 11,400
11 - 25	2112	2261	249,900	240,900	- 9,000

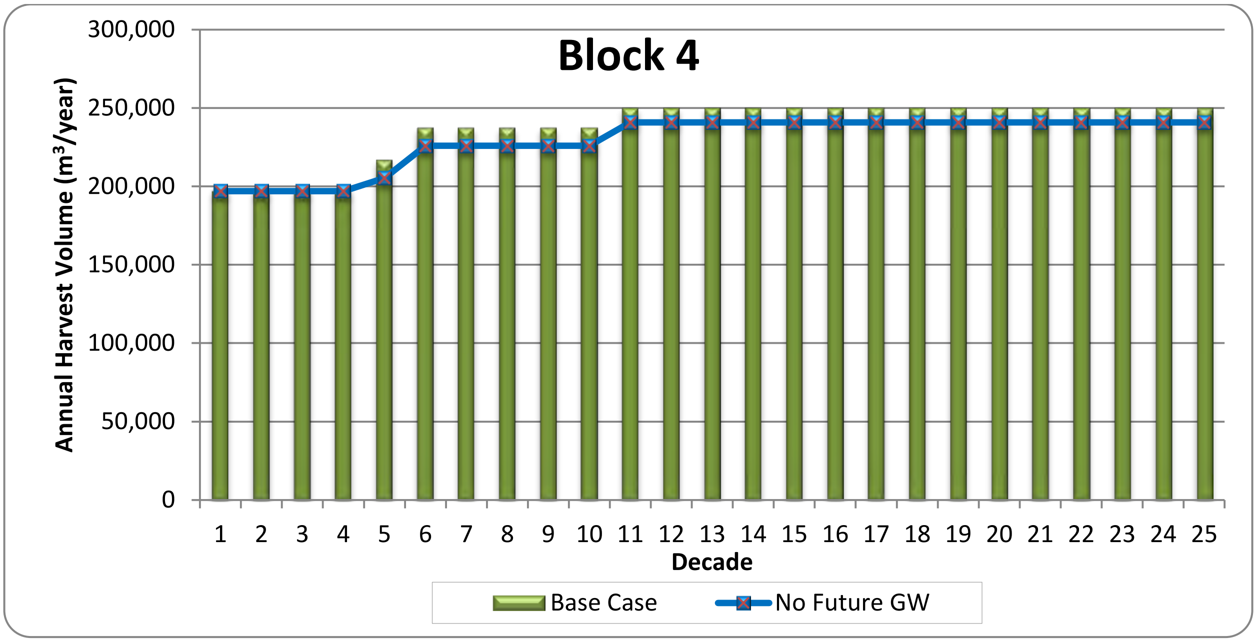

Figure 115 – Block 4 Harvest levels with no Future Genetic Worth

Long-term timber supply from Block 3 and 5 combined is 800 m^3/year (1.8%) lower when future stand yields do not include benefits of genetic gain. Total harvest is reduced by 137,000 m^3 (1.2%).

Table 115 – Block 3&5 Harvest levels with no Future Genetic Worth

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1 – 7	2012	2281	41,300	41,400	+ 100
8 - 25	2082	2261	45,000	44,200	- 800

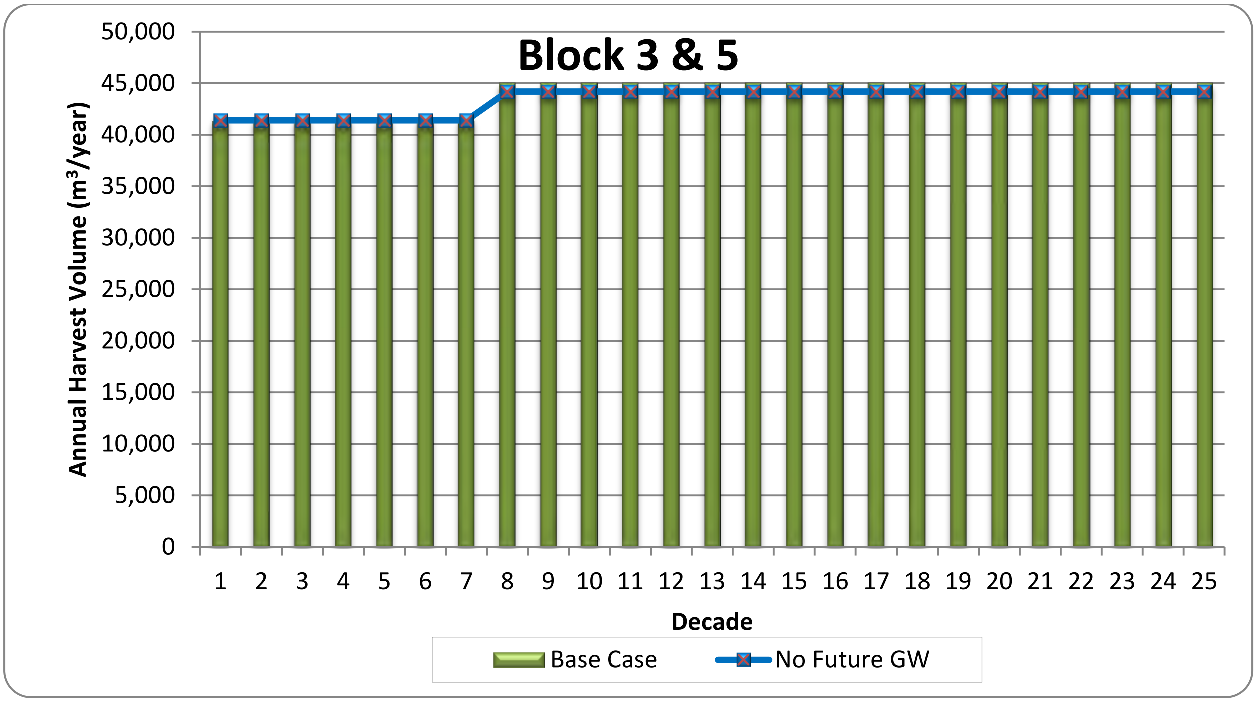

Figure 116 – Block 3&5 Harvest levels with no Future Genetic Worth

Appendix B11 – Increased Harvest from Non-conventional Areas

As mentioned in Section 4.9, this analysis was conducted by managing conventional and non-conventional (NC) landbases separately. For the first 40 years, non-conventional harvest is restricted to current mature timber and a non-declining even-flow. Afterwards, non-conventional volume is strictly second growth. The charts in this appendix indicate the contribution from conventional and non-conventional in a cumulative manner.

Under these assumptions, Block 1 timber supply can be increased by 39,000 m^3/year (9.0%) over the first 40 years. After that there is a period of 50 years over which non-conventional volume initially falls 3,400 m^3/year (0.8%) below the Base Case (in Decade 5) but then gradually recovers such that the LTHL is 23,800 m^3/year (5.5%) higher than the Base Case. Conventional harvest decreases by 200 m^3/year throughout the planning period. Total harvest increases by 5.72 million m^3 (5.3%).

Table 116 – Block 1 Harvest levels with increased non-conventional harvest

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	Increased NC	Base Case	Increased NC	Base Case	Increased NC
1 - 4	2012	2051	385,300	385,100	50,000	89,200	435,300	474,300
5	2052	2061	385,300	385,100	50,000	46,800	435,300	431,900
6	2062	2071	385,300	385,100	50,000	51,500	435,300	436,600
7	2072	2081	385,300	385,100	50,000	56,600	435,300	441,700
8	2082	2091	385,300	385,100	50,000	62,300	435,300	447,400
9	2092	2101	385,300	385,100	50,000	58,500	435,300	453,600
10 - 25	2102	2261	385,300	385,100	50,000	74,100	435,300	459,100

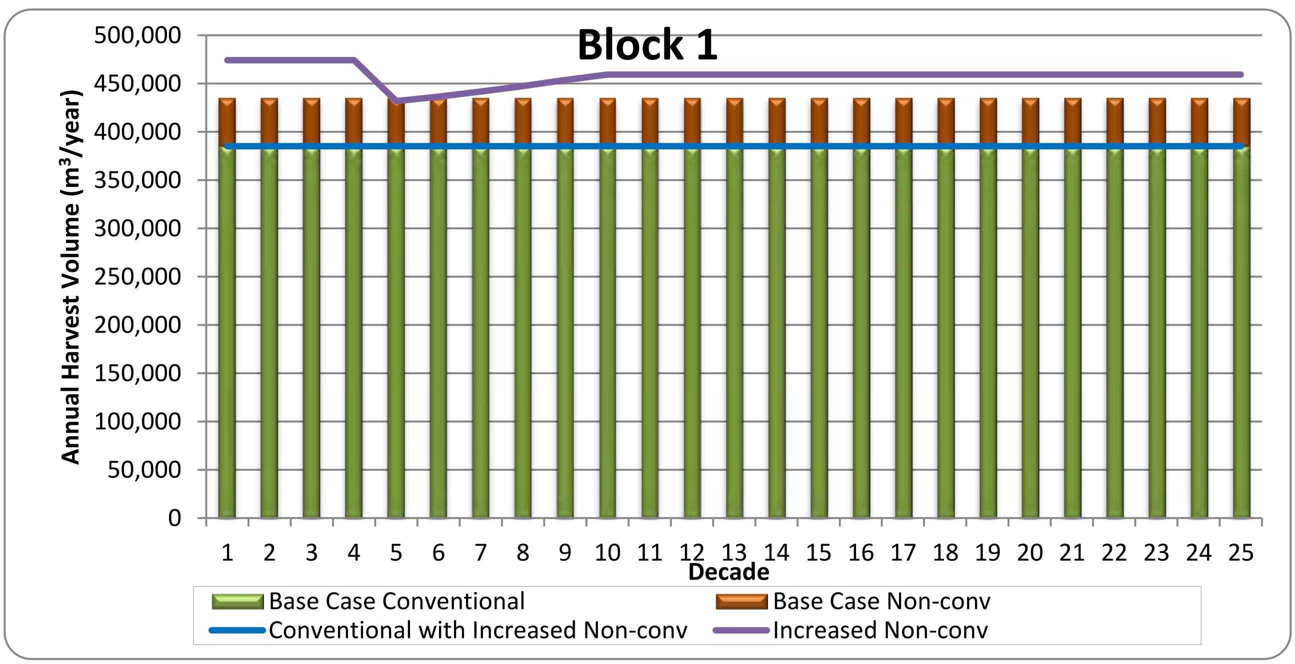

Figure 117 – Block 1 Harvest levels with increased non-conventional harvest

Block 2 non-conventional timber supply for the first 40 years is increased by 42,800 m^3/year when a non-conventional partition is applied as described. Conventional timber supply is decreased by 2,800 m^3/year in the first 10 years; thus the total initial harvest level is increased by 40,000 m^3/year (4.6%). Total harvest is increased by 44,300 m^3/year (5.7%) in the second decade and 42,200 m^3/year (6.0%) in Decades 3 and 4. Beginning in Decade 5 and continuing until Decade 15 total harvest is reduced by between 14,700 m^3/year and 31,200 m^3/year (1.8% - 4.4%) as immature non-conventional stands reach operable size. As a result of lower THLB inventory, long-term harvest is reduced by 12,200 m3/year (1.5%). Total harvest is lessened by 2.14 million m^3 (1.1%), with total conventional volume immaterially changed.

Table 117 – Block 2 Harvest levels with increased non-conventional harvest

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	Increased NC	Base Case	Increased NC	Base Case	Increased NC
1	2012	2021	824,300	821,500	40,000	82,800	864,300	904,300
2	2022	2031	737,900	739,300	40,000	82,800	777,900	822,100
3 - 4	2032	2051	666,100	665,400	40,000	82,800	706,100	748,200
5	2052	2061	677,200	665,400	28,900	9,500	706,100	674,900
6	2062	2071	716,100	715,400	40,000	10,500	756,100	725,900
7	2072	2081	766,000	765,400	40,000	11,500	806,100	776,900
8	2082	2091	793,700	794,300	40,000	12,700	833,700	807,000
9	2092	2101	793,700	794,300	40,000	13,900	833,700	808,200
10	2102	2111	793,700	794,300	40,000	15,300	833,700	809,600
11	2112	2121	793,700	794,300	40,000	16,900	833,700	811,200
12	2122	2131	793,700	794,300	40,000	18,600	833,700	812,900
13	2132	2141	793,700	794,300	40,000	20,400	833,700	814,700
14	2142	2151	793,700	794,300	40,000	22,500	833,700	816,800
15	2152	2161	793,700	794,300	40,000	24,700	833,700	819,000
16 - 25	2162	2261	793,700	794,300	40,000	27,200	833,700	821,500

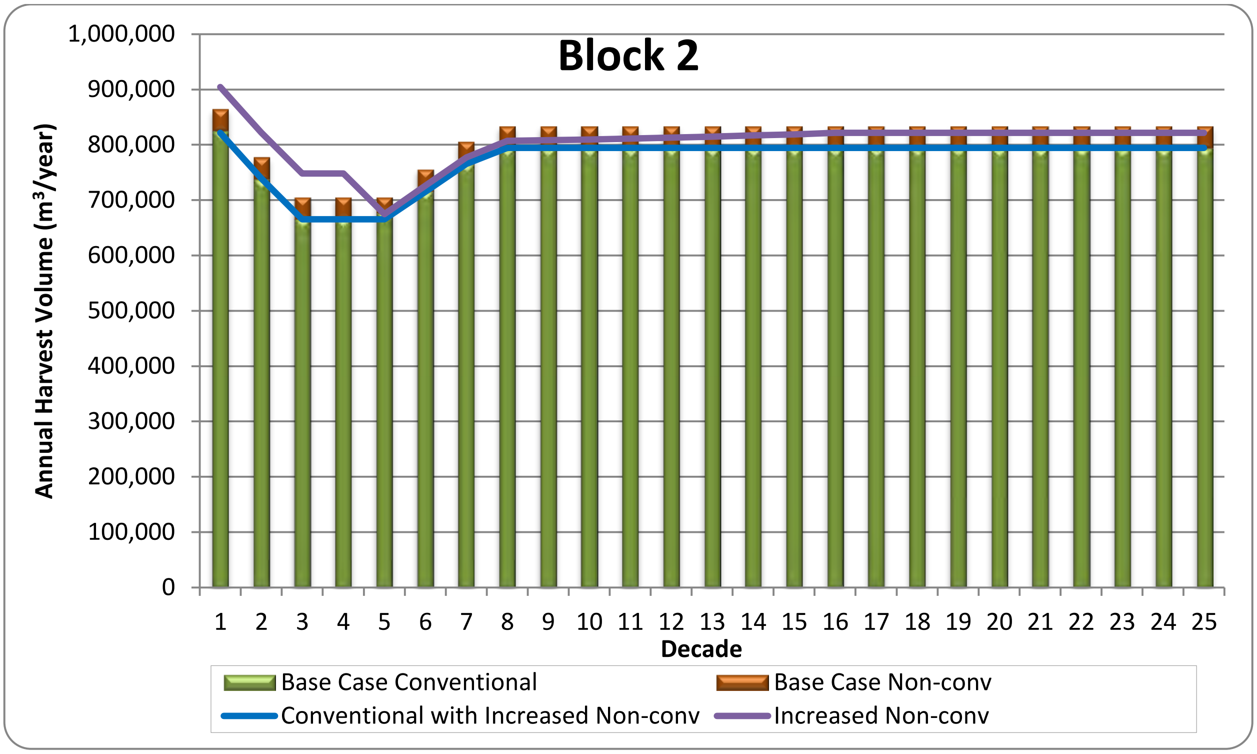

Figure 118 – Block 2 Harvest levels with increased non-conventional harvest

Block 4 timber supply over the first 40 years can be significantly improved by implementing a non-conventional partition as both conventional and non-conventional volumes can be increased. Short-term conventional harvest can be increased due to lower mid-term harvest levels with initial conventional volume increased by 25,400 m^3/year (15.8%). The initial non-conventional volume can be increased by 4,800 m^3/year (13.3%) resulting in an overall increase to the initial harvest of 30,200 m^3/year (15.3%). Conventional harvest can increase through Decades 5 and 6 as immature stands grow into merchantable conditions such that the long-term conventional harvest of 220,600 m^3/year is reached in the sixth decade. Non-conventional volume remains steady at 40,800 m^3/year for the first 40 years and then declines to nearly zero for 20 years due to lack of operable inventory. Beginning in Decade 7, non-conventional volume gradually increases as immature stands grow into merchantable conditions. Long-term non-conventional harvest of 15,700 m^3/year is reached in Decade 14. Total harvest is reduced by 1.84 million m^3 of which 1.77 million m^3 is non-conventional.

Table 118 – Block 4 Harvest levels with increased non-conventional harvest

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	Increased NC	Base Case	Increased NC	Base Case	Increased NC
1 - 4	2012	2051	161,000	186,400	36,000	40,800	197,000	227,100
5	2052	2061	183,400	205,000	33,300	600	216,700	205,600
6	2062	2071	233,400	220,600	3,900	800	237,300	221,400
7	2072	2081	237,000	220,600	300	1,300	237,300	221,900
8	2082	2091	236,700	220,600	600	1,900	237,300	222,500
9	2092	2101	236,900	220,600	400	2,800	237,300	223,400
10	2102	2111	229,500	220,600	7,800	4,300	237,300	224,900
11	2112	2121	243,600	220,600	6,200	6,400	249,900	227,000
12	2122	2131	213,900	220,600	36,000	9,600	249,900	230,200
13	2132	2141	231,900	220,600	18,000	14,400	249,900	235,000
14 - 15	2142	2161	249,900	220,600	0	15,700	249,900	236,300
16 - 21	2162	2221	213,900	220,600	36,000	15,700	249,900	236,300
22	2222	2231	225,300	220,600	24,600	15,700	249,900	236,300
23	2232	2241	213,900	220,600	36,000	15,700	249,900	236,300
24	2242	2251	225,300	220,600	24,600	15,700	249,900	236,300
25	2252	2261	230,600	220,600	19,300	15,700	249,900	236,300

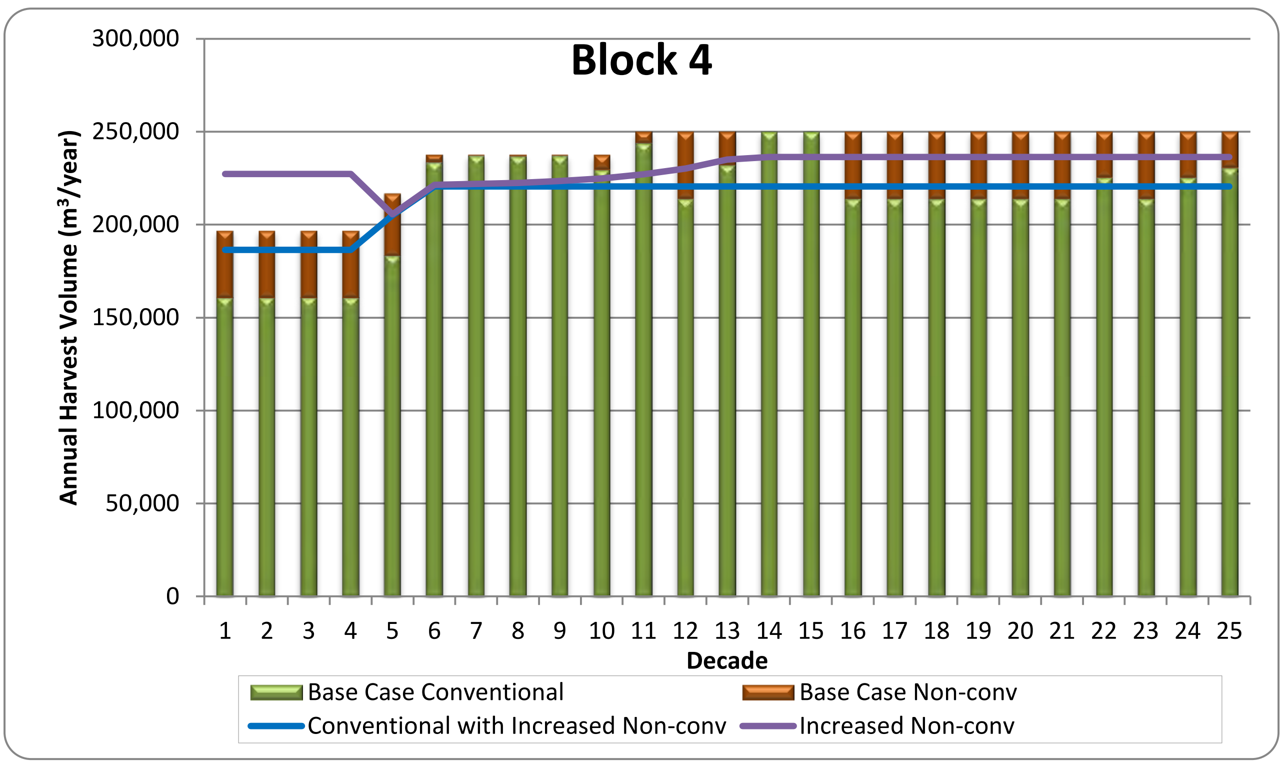

Figure 119 – Block 4 Harvest levels with increased non-conventional harvest

Similar to Block 4, short-term timber supply from Blocks 3 and 5 can be improved by implementing a non-conventional partition. An additional 4,100 m^3/year (82%) can be harvested non-conventionally with no change to conventional volumes; therefore, total harvest is increased by 4,100 m^3/year (10.2%). Under this scenario, non-conventional volume is inconsequential from Decade 5 to Decade 8. Beginning in Decade 9, non-conventional volume begins to contribute to timber supply as immature stands reach merchantable size. Long-term non-conventional harvest level of 3,800 m^3/year is achieved beginning in Decade 13. Total harvest is decreased by 315,000 m^3 (2.9%).

Table 119 – Block 3&5 Harvest levels with increased non-conventional harvest

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	Increased NC	Base Case	Increased NC	Base Case	Increased NC
1 - 4	2012	2051	36,300	36,400	5,000	9,100	41,300	45,500
5	2052	2061	36,300	36,400	5,000	0	41,300	36,400
6	2062	2071	37,300	36,400	4,000	200	41,300	36,600
7	2072	2081	36,300	36,400	5,000	300	41,300	36,700
8	2082	2091	40,000	40,000	5,000	500	45,000	40,500
9	2092	2101	40,000	40,000	5,000	800	45,000	40,700
10	2102	2111	42,300	40,000	2,700	1,100	45,000	41,100
11	2112	2121	41,700	40,000	3,300	1,700	45,000	41,700
12	2122	2131	40,000	40,000	5,000	2,600	45,000	42,500
13	2132	2141	40,800	40,000	4,200	3,800	45,000	43,800
14	2142	2151	42,500	40,000	2,500	3,800	45,000	43,800
15 - 25	2152	2261	40,000	40,000	5,000	3,800	45,000	43,800

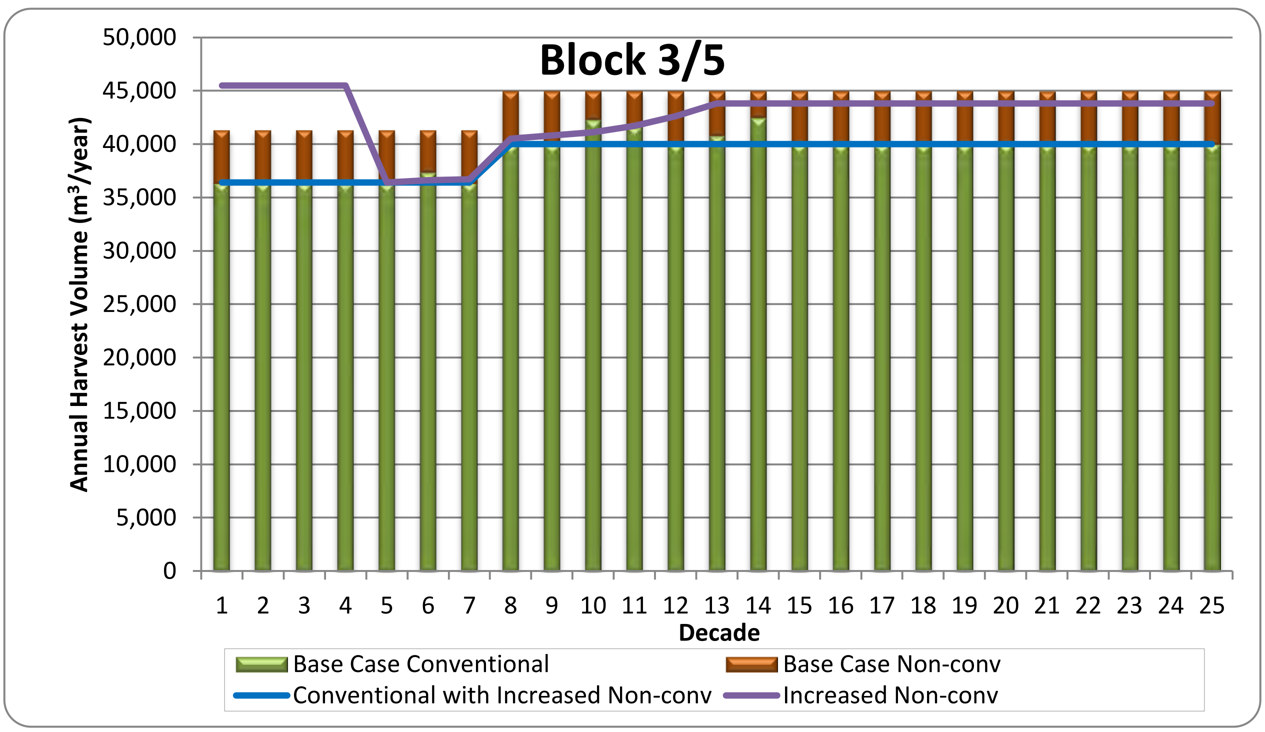

Figure 120 – Block 3&5 Harvest levels with increased non-conventional harvest

Appendix B12 – Remove non-conventional volume constraint

The charts in this appendix display the contribution from conventional and non-conventional in a cumulative manner.

Timber supply from Block 1 is improved by 25,000 m^3/year (5.7%) to 460,300 m^3/year when the constraint on contribution from non-conventional stands is removed. In total, 6.25 million m^3 (5.7%) more is harvested and non-conventional volume is 16.1% of the total. Note the large variance in conventional/non-conventional split through time; non-conventional contribution varies from 0.7% in Decade 15 to 40.6% in Decade 12.

Table 120 – Block 1 Harvest levels without non-conventional constraint

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	No NC Constraint	Base Case	No NC Constraint	Base Case	No NC Constraint
1	2012	2021	385,300	342,200	50,000	118,100	435,300	460,300
2	2022	2031	385,300	390,300	50,000	70,000	435,300	460,300
3	2032	2041	385,300	318,900	50,000	141,400	435,300	460,300
4	2042	2051	385,300	377,300	50,000	83,000	435,300	460,300
5	2052	2061	385,300	383,000	50,000	77,300	435,300	460,300
6	2062	2071	385,300	403,200	50,000	57,100	435,300	460,300
7	2072	2081	385,300	450,100	50,000	10,200	435,300	460,300
8	2082	2091	385,300	430,600	50,000	29,700	435,300	460,300
9	2092	2101	385,300	434,800	50,000	25,500	435,300	460,300
10	2102	2111	385,300	443,800	50,000	16,500	435,300	460,300
11	2112	2121	385,300	337,300	50,000	123,000	435,300	460,300
12	2122	2131	385,300	273,500	50,000	186,800	435,300	460,300
13	2132	2141	385,300	388,800	50,000	71,500	435,300	460,300
14	2142	2151	385,300	445,600	50,000	14,700	435,300	460,300
15	2152	2161	385,300	457,200	50,000	3,100	435,300	460,300
16	2162	2171	385,300	333,000	50,000	127,300	435,300	460,300
17	2172	2181	385,300	287,900	50,000	172,400	435,300	460,300
18	2182	2191	385,300	371,100	50,000	89,200	435,300	460,300
19	2192	2201	385,300	364,600	50,000	95,700	435,300	460,300
20	2202	2211	385,300	426,200	50,000	34,100	435,300	460,300
21	2212	2221	385,300	452,300	50,000	8,000	435,300	460,300
22	2222	2231	385,300	392,200	50,000	68,100	435,300	460,300
23	2232	2241	385,300	419,400	50,000	40,900	435,300	460,300
24	2242	2251	385,300	296,200	50,000	164,100	435,300	460,300
25	2252	2261	385,300	430,700	50,000	29,600	435,300	460,300

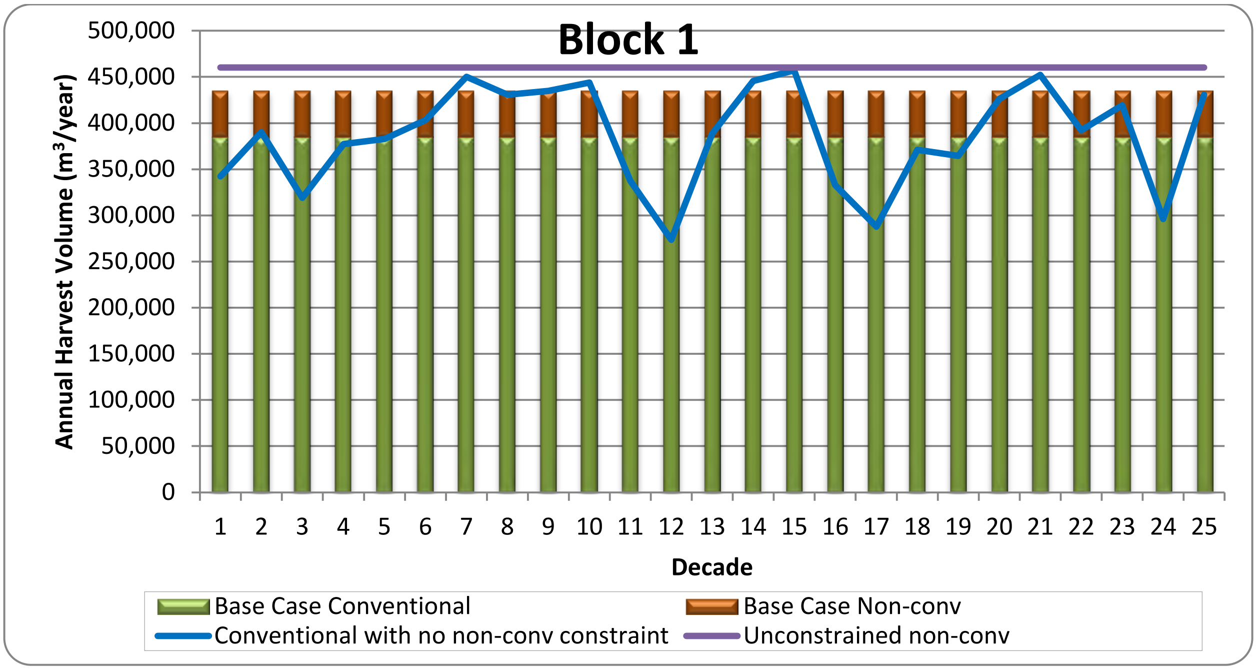

Figure 121 – Block 1 Harvest levels without non-conventional constraint

When the constraint on non-conventional timber is removed, timber supply from Block 2 can be improved by 1.4% in the first 20 years: 12,000 m^3/year in the first decade and 10,700 m^3/year in the second decade. The gain in the mid-term is 3,700 m^3/year (0.5%) and 8,500 m^3/year (1.0%) in the long-term. Total harvest increases by 1.94 million m^3 (1.0%) to 205.23 million m^3, of which non-conventional is 5.7% (11.75 million m^3). The variance in the conventional/non-conventional split is not as large as in Block 1, varying from 0.3% in Decade 21 to 20.1% in Decade 16.

Table 121 – Block 2 Harvest levels without non-conventional constraint

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	No NC Constraint	Base Case	No NC Constraint	Base Case	No NC Constraint
1	2012	2021	824,300	754,000	40,000	122,300	864,300	876,300
2	2022	2031	737,900	706,500	40,000	82,100	777,900	788,600
3	2032	2041	666,100	626,500	40,000	83,300	706,100	709,800
4	2042	2051	666,100	685,700	40,000	24,100	706,100	709,800
5	2052	2061	677,200	695,300	28,900	14,500	706,100	709,800
6	2062	2071	716,100	732,800	40,000	27,000	756,100	759,800
7	2072	2081	766,100	798,200	40,000	11,600	806,100	809,800
8	2082	2091	793,700	833,200	40,000	9,000	833,700	842,200
9	2092	2101	793,700	834,100	40,000	8,100	833,700	842,200
10	2102	2111	793,700	826,600	40,000	15,500	833,700	842,200
11	2112	2121	793,700	830,500	40,000	11,700	833,700	842,200
12	2122	2131	793,700	799,400	40,000	42,700	833,700	842,200
13	2132	2141	793,700	782,200	40,000	59,900	833,700	842,200
14	2142	2151	793,700	833,600	40,000	8,600	833,700	842,200
15	2152	2161	793,700	755,700	40,000	86,500	833,700	842,200
16	2162	2171	793,700	672,600	40,000	169,500	833,700	842,200
17	2172	2181	793,700	821,000	40,000	21,200	833,700	842,200
18	2182	2191	793,700	783,600	40,000	58,600	833,700	842,200
19	2192	2201	793,700	730,900	40,000	111,300	833,700	842,200
20	2202	2211	793,700	814,500	40,000	27,700	833,700	842,200
21	2212	2221	793,700	839,700	40,000	2,500	833,700	842,200
22	2222	2231	793,700	819,200	40,000	22,900	833,700	842,200
23	2232	2241	793,700	790,800	40,000	51,300	833,700	842,200
24	2242	2251	793,700	795,500	40,000	46,600	833,700	842,200
25	2252	2261	793,700	785,300	40,000	56,900	833,700	842,200

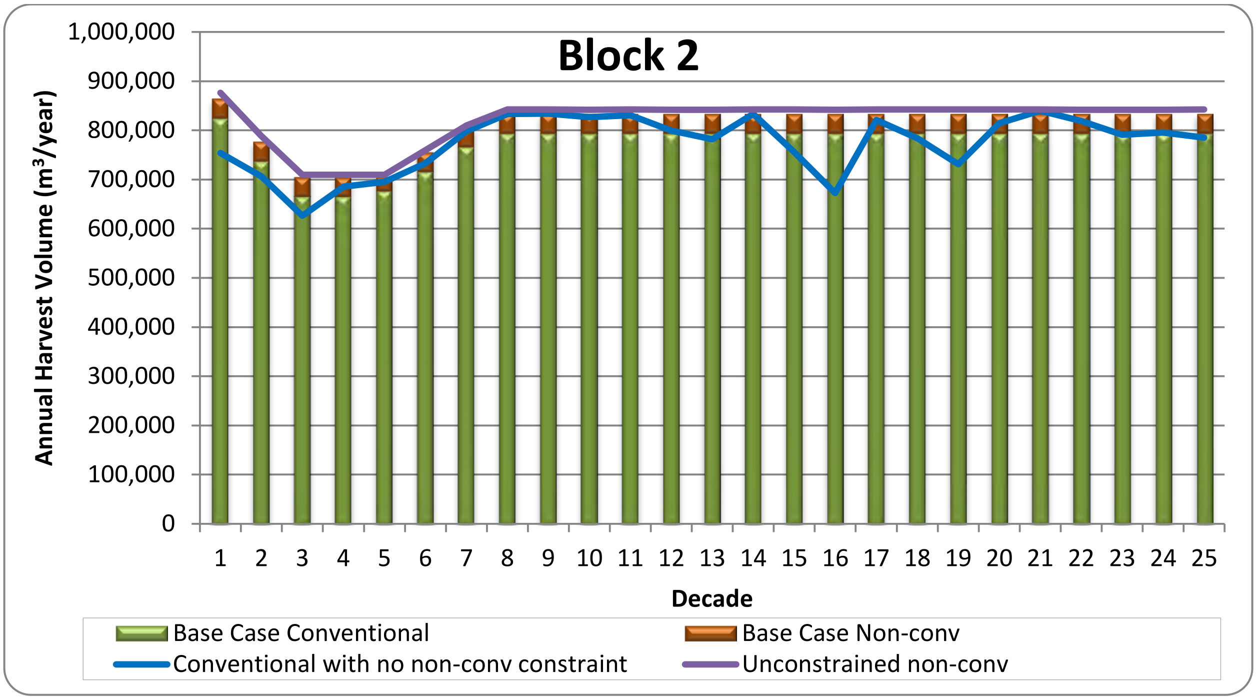

Figure 122 – Block 2 Harvest levels without non-conventional constraint

An increase in short-term timber supply of 16,600 m^3/year (8.4%), to 213,600 m^3/year, is created in Block 4 when the non-conventional constraint is removed. This increase continues through the following 30 years before the lack of operable non-conventional inventory creates a timber supply deficit (relative to the Base Case) in Decades 5 and 6. In Decades 7 -10, timber supply is improved by 5,000 m^3/year (2.1%) but for the remainder of the planning period timber supply is reduced by 7,500 m^3/year (3.0%). Total harvest is reduced by 401,000 m3 (0.7%) to 58.99 million m^3 and non-conventional contributes 9.6% (5.68 million m^3). Non-conventional contribution varies from 0.1% in Decade 15 to 50% in Decade 16.

Table 122 – Block 4 Harvest levels without non-conventional constraint

			Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
Period (Decade #)	Start Year	End Year	Base Case	No NC Constraint	Base Case	No NC Constraint	Base Case	No NC Constraint
1	2012	2021	161,000	166,100	36,000	47,500	197,000	213,600
2	2022	2031	161,000	131,700	36,000	82,000	197,000	213,600
3	2032	2041	161,000	166,200	36,000	47,400	197,000	213,600
4	2042	2051	161,000	213,300	36,000	300	197,000	213,600
5	2052	2061	183,400	208,700	33,300	5,000	216,700	213,600
6	2062	2071	233,400	223,900	3,900	2,300	237,300	226,300
7	2072	2081	237,000	242,000	300	400	237,300	242,400
8	2082	2091	236,700	238,200	600	4,100	237,300	242,300
9	2092	2101	236,900	241,800	400	500	237,300	242,400
10	2102	2111	229,500	240,000	7,800	2,300	237,300	242,300
11	2112	2121	243,600	233,500	6,200	8,900	249,900	242,400
12	2122	2131	213,900	189,100	36,000	53,200	249,900	242,400
13	2132	2141	231,900	233,400	18,000	9,000	249,900	242,400
14	2142	2151	249,900	241,900	0	500	249,900	242,400
15	2152	2161	213,900	242,000	0	300	249,900	242,400
16	2162	2171	213,900	121,100	36,000	121,300	249,900	242,400
17	2172	2181	213,900	208,800	36,000	33,600	249,900	242,400
18	2182	2191	213,900	238,700	36,000	3,700	249,900	242,400
19	2192	2201	213,900	233,900	36,000	8,400	249,900	242,300
20	2202	2211	213,900	213,500	36,000	28,900	249,900	242,400
21	2212	2221	213,900	241,900	36,000	500	249,900	242,400
22	2222	2231	225,300	203,600	24,600	38,800	249,900	242,400
23	2232	2241	213,900	184,700	36,000	57,600	249,900	242,400
24	2242	2251	225,300	238,700	24,600	3,600	249,900	242,400
25	2252	2261	230,600	234,800	19,300	7,600	249,900	242,400

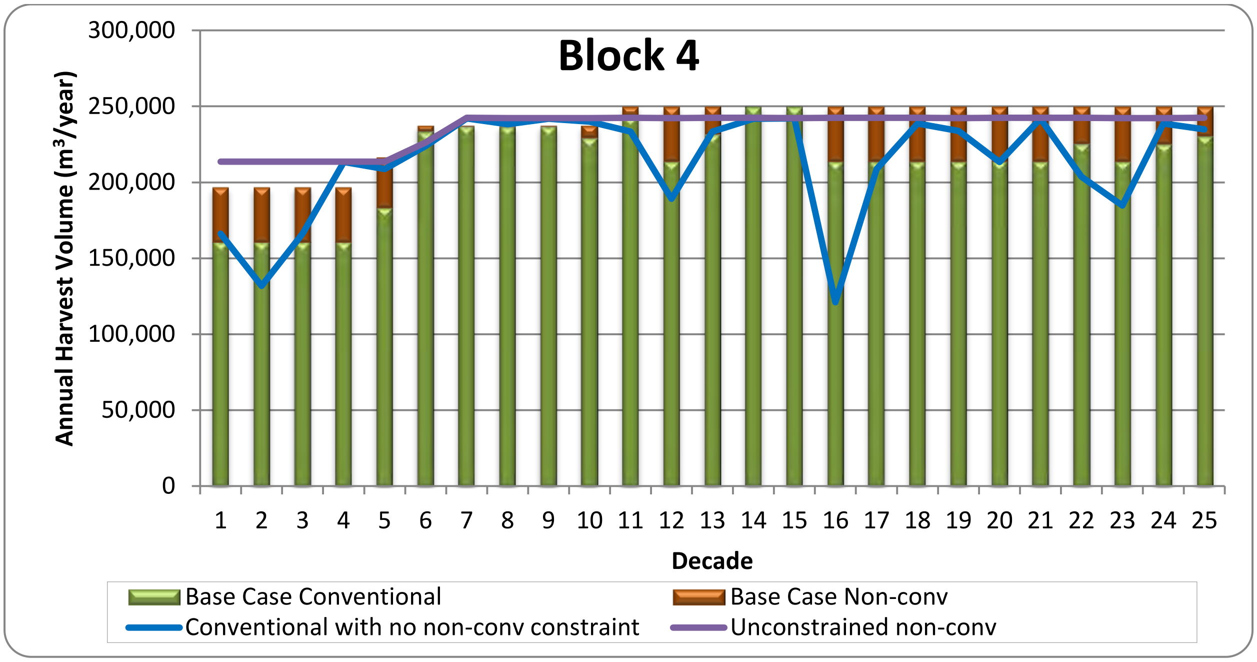

Figure 123 – Block 4 Harvest levels without non-conventional constraint

When the constraint on contribution from non-conventional stands is removed from Blocks 3 and 5, short-term harvest improves by 4,100 m^3/year (9.9%) to 45,400 m^3/year and long-term harvest improves by 700 m^3/year (1.6%) to 45,700 m^3/year. Total harvest increases by 413,000 m^3 (3.8%). Non-conventional contributes 12.3% of the overall harvest, varying from 0% in the fourth decade to 52% in the sixteenth decade.

Table 123 – Block 3&5 Harvest levels without non-conventional constraint

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)					
			Conventional		Non-Conventional		Total	
			Base Case	No NC Constraint	Base Case	No NC Constraint	Base Case	No NC Constraint
1	2012	2021	36,300	30,300	5,000	15,100	41,300	45,400
2	2022	2031	36,300	24,100	5,000	21,300	41,300	45,400
3	2032	2041	36,300	45,200	5,000	200	41,300	45,400
4	2042	2051	36,300	45,400	5,000	0	41,300	45,400
5	2052	2061	36,300	45,000	5,000	400	41,300	45,400
6	2062	2071	37,300	43,200	4,000	2,200	41,300	45,400
7	2072	2081	36,300	45,100	5,000	300	41,300	45,400
8	2082	2091	40,000	44,300	5,000	1,400	45,000	45,700
9	2092	2101	40,000	45,500	5,000	100	45,000	45,700
10	2102	2111	42,300	40,500	2,700	5,200	45,000	45,700
11	2112	2121	41,700	41,800	3,300	3,800	45,000	45,700
12	2122	2131	40,000	40,400	5,000	5,300	45,000	45,700
13	2132	2141	40,800	38,800	4,200	6,900	45,000	45,700
14	2142	2151	42,500	45,600	2,500	0	45,000	45,700
15	2152	2161	40,000	38,700	5,000	7,000	45,000	45,700
16	2162	2171	40,000	22,000	5,000	23,700	45,000	45,700
17	2172	2181	40,000	23,200	5,000	22,500	45,000	45,700
18	2182	2191	40,000	45,200	5,000	500	45,000	45,700
19	2192	2201	40,000	44,300	5,000	1,400	45,000	45,700
20	2202	2211	40,000	44,400	5,000	1,300	45,000	45,700
21	2212	2221	40,000	42,800	5,000	2,800	45,000	45,700
22	2222	2231	40,000	45,400	5,000	300	45,000	45,700
23	2232	2241	40,000	41,000	5,000	4,700	45,000	45,700
24	2242	2251	40,000	34,600	5,000	11,100	45,000	45,700
25	2252	2261	40,000	43,000	5,000	2,700	45,000	45,700

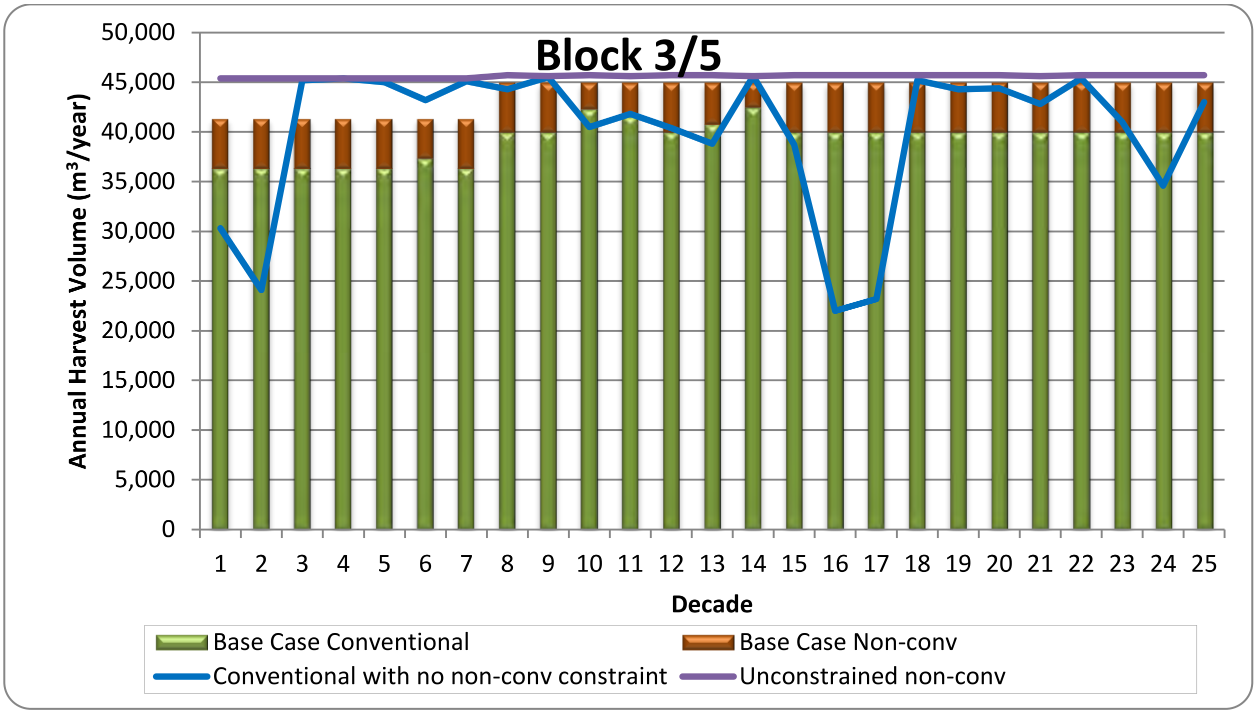

Figure 124 – Block 3&5 Harvest levels without non-conventional constraint

Appendix B13 – Exclude non-conventional operable land base

Assuming no contribution from non-conventional stands reduces the timber supply from Block 1 by 50,000 m^3/year (11.5%). Alternatively, the initial harvest level of the Base Case can be achieved by reducing longer-term harvest by 52,500 m3/year (12.1%) and total harvest by 12.27 million m3 (11.3%).

Table 124 – Block 1 Harvest levels with no contribution from non-conventional

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	No non-conventional	Difference	Alternate No non-conventional	Difference
1	2012	2021	435,300	385,300	- 50,000	435,300	0
2	2022	2031	435,300	385,300	- 50,000	422,400	- 12,900
3	2032	2041	435,300	385,300	- 50,000	380,200	- 55,100
4 - 5	2042	2061	435,300	385,300	- 50,000	380,700	- 54,600
6 - 25	2062	2261	435,300	385,300	- 50,000	382,800	- 52,500

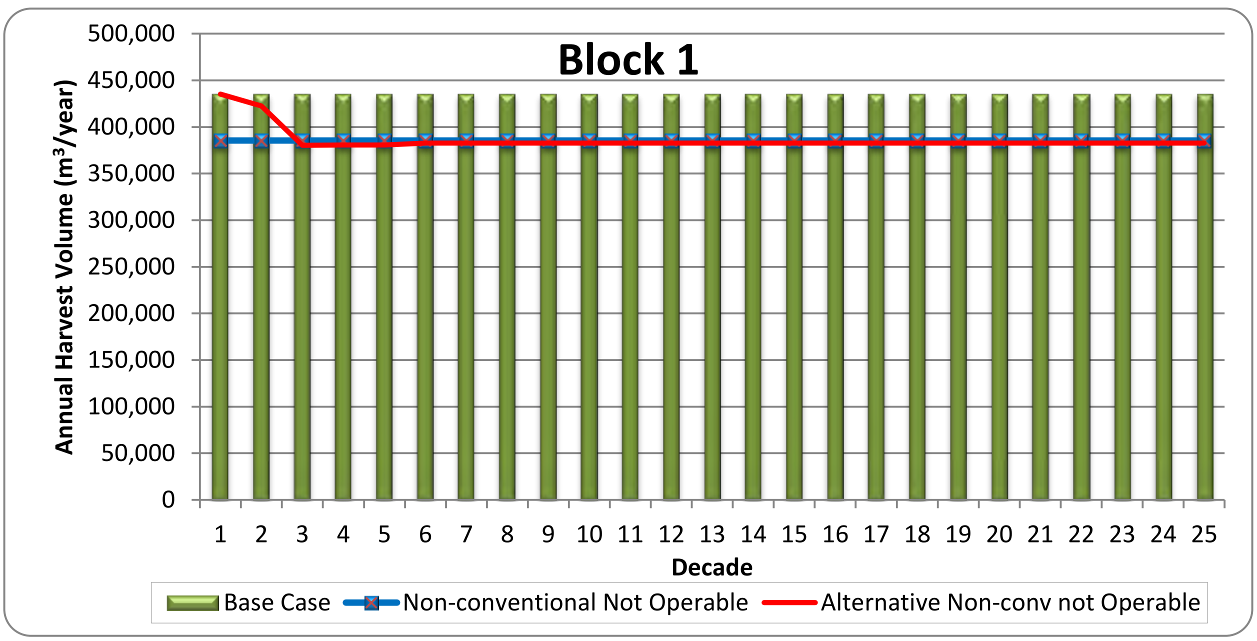

Figure 125 – Block 1 Harvest levels with no contribution from non-conventional

When there is no timber supply contribution from non-conventional stands, the harvest level in Block 2 declines by 5.7% in the first 20 years: 49,200 m^3/year in first decade and 44,300 m^3/year in the second decade. Mid-term harvest decreases by 35,500 m^3/year (5.0%) and long-term harvest by 40,400 m^3/year (4.8%). Total harvest is reduced by 9.98 million m^3 (4.9%) – an average of roughly 39,900 m^3/year. Alternatively, Base Case harvest levels can be equaled for the first 20 years after which harvest levels must decline to 700,100 m^3/year for a period of 50 years. Timber supply then recovers over 20 years to a long-term cut of 789,300 m^3/year, 44,000 m³/year (12.1%) less than the Base Case. Total harvest in this alternate schedule is 10.25 million m³ (5.0%) less than the Base Case – an average of about 41,000 m³/year.

Table 125 – Block 2 Harvest levels with no contribution from non-conventional

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m³)				
			Base Case	No non-conventional	Difference	Alternate No non-conventional	Difference
1	2012	2021	864,300	815,100	- 49,200	864,300	0
2	2022	2031	777,900	733,600	- 44,300	777,900	0
3 - 5	2032	2061	706,100	670,600	- 35,500	700,100	- 6,000
6	2062	2071	756,100	720,600	- 35,500	700,100	- 56,000
7	2072	2081	806,100	770,600	- 35,500	700,100	- 106,000
8	2082	2091	833,700	793,300	- 40,400	743,700	- 90,000
9 - 25	2092	2261	833,700	793,300	- 40,400	789,300	- 44,400

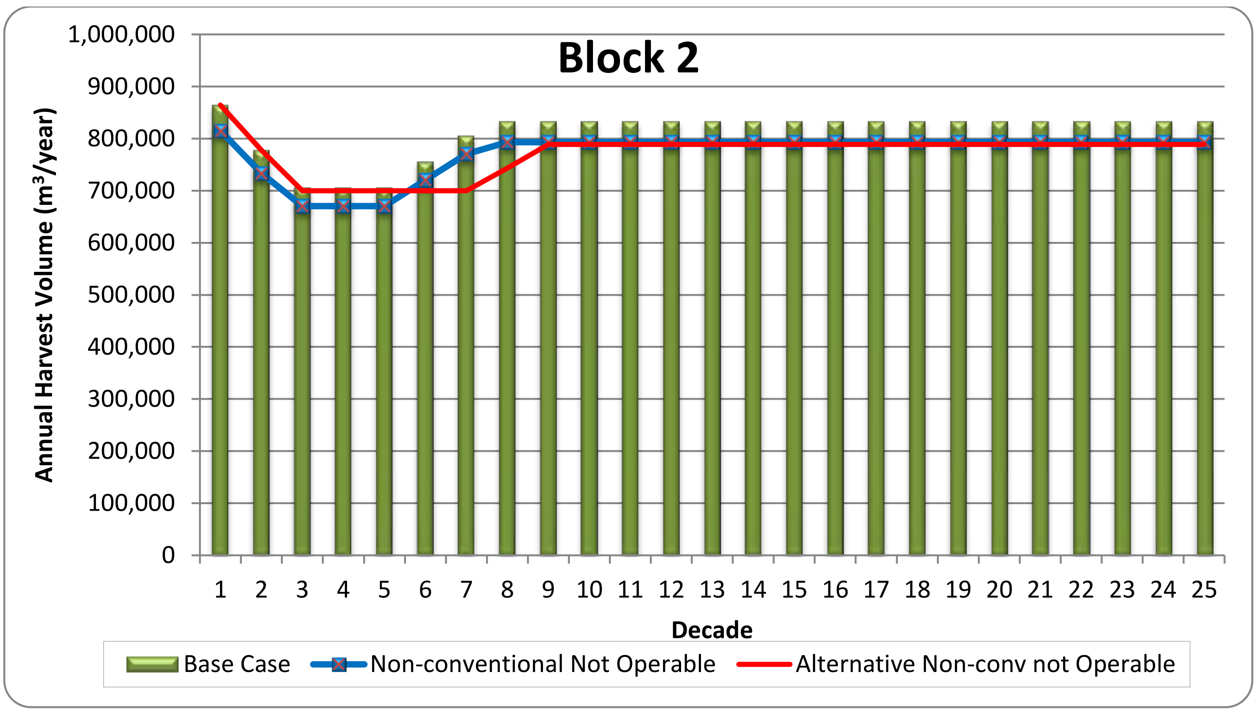

Figure 126 – Block 2 Harvest levels with no contribution from non-conventional

Eliminating harvest from non-conventional stands reduces short-term timber supply from Block 4 by 36,000 m³/year (18.3%) to 161,000 m³/year. Harvest then increases over a period of 40 years to the new long-term level of 225,000 m³/year, 24,900 m³/year (10.0%) less than the Base Case. Total harvest is 6.60 million m³ (11.1%) less than the Base Case. It is possible to maintain the initial harvest of the Base Case by reducing mid-term harvest and delaying the transition to the new long-term harvest level of 226,000 m³/year. This alternate schedule harvests 7.31 million m³ (12.3%) less than the Base Case.

Table 126 – Block 4 Harvest levels with no contribution from non-conventional

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	No non-conventional	Difference	Alternate No non-conventional	Difference
1	2012	2021	197,000	161,000	- 36,000	197,000	0
2	2022	2031	197,000	161,000	- 36,000	155,300	- 41,700
3 - 4	2032	2051	197,000	161,000	- 36,000	153,000	- 44,000
5	2052	2061	216,700	177,100	- 39,600	153,000	- 63,700
6	2062	2071	237,300	194,800	- 42,500	168,300	- 69,000
7	2072	2081	237,300	214,200	- 23,100	185,100	- 52,200
8	2082	2091	237,300	225,000	- 12,300	203,700	- 33,600
9	2092	2101	237,300	225,000	- 12,300	224,000	- 13,300
10	2102	2111	237,300	225,000	- 12,300	226,000	- 11,300
11 - 25	2112	2261	249,900	225,000	- 24,900	226,000	- 23,900

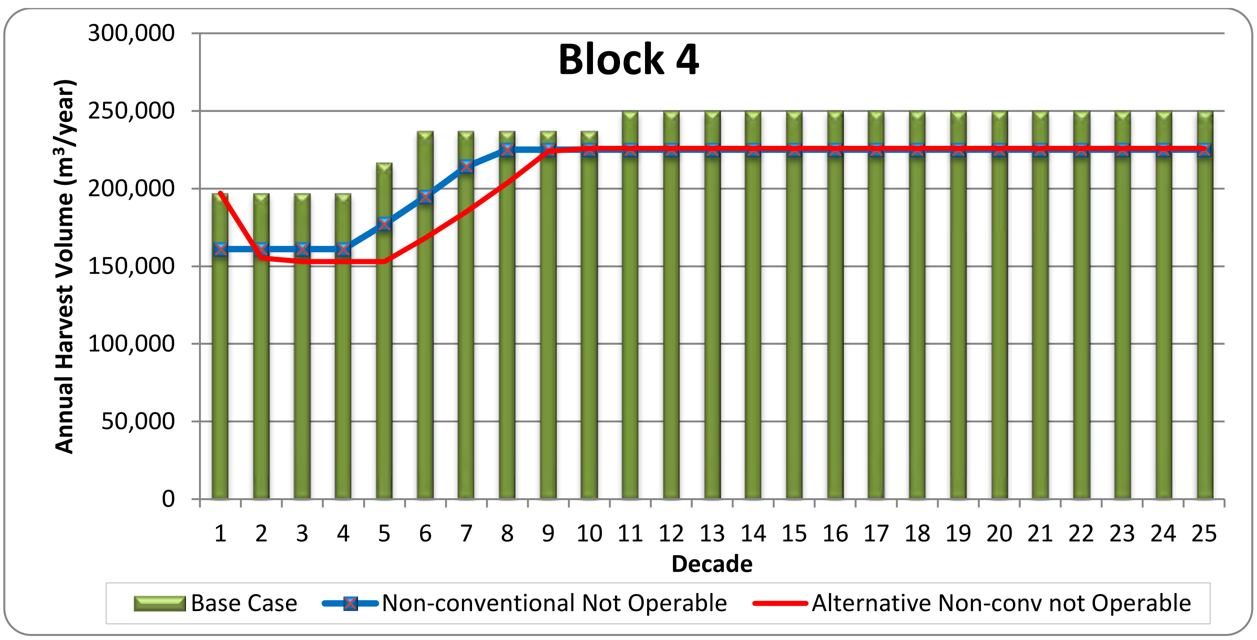

Figure 127 – Block 4 Harvest levels with no contribution from non-conventional

When non-conventional stands provide no timber supply, the harvest level in Blocks 3 and 5 declines by 4,900 m^3/year (11.9%) for the first 70 years and 5,000 m^3/year (11.1%) for the remaining 180 years. Total harvest is reduced by 1.24 million m^3 (11.3%). Alternatively, initial Base Case harvest level can be equaled after which harvest levels must decline to 33,400 m^3/year for a period of 50 years. Timber supply then recovers over 20 years to a long-term cut of 39,900 m^3/year, 5,100 m^3/year (11.3%) less than the Base Case. Total harvest in this alternate schedule is 1.37 million m^3 (12.4%) less than the Base Case – an average of about 5,500 m^3/year.

Table 127 – Block 3&5 Harvest levels with no contribution from non-conventional

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	No non-conventional	Difference	Alternate No non-conventional	Difference
1	2012	2021	41,300	36,400	- 4,900	41,300	0
2	2022	2031	41,300	36,400	- 4,900	37,200	- 4,100
3	2032	2041	41,300	36,400	- 4,900	33,500	- 7,800
4 – 7	2042	2081	41,300	36,400	- 4,900	33,400	- 7,900
8	2082	2091	45,000	40,000	- 5,000	38,400	- 6,600
9 - 25	2092	2261	45,000	40,000	- 5,000	39,900	- 5,100

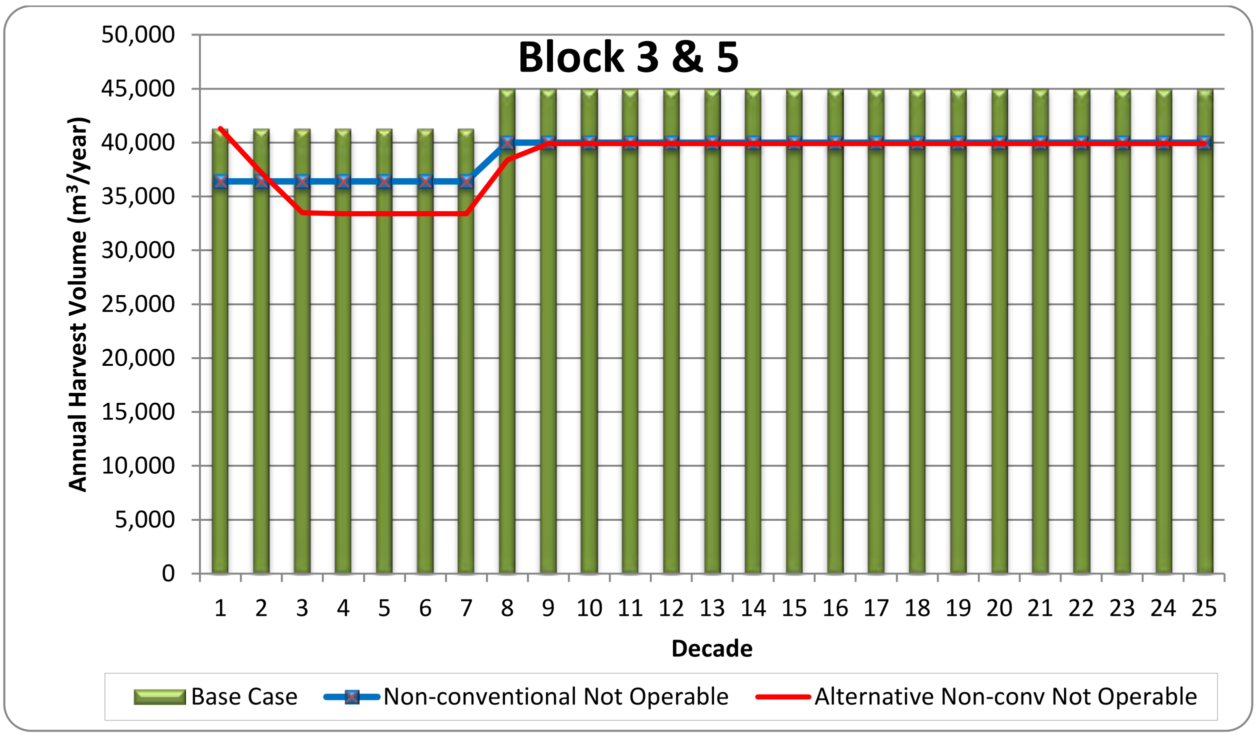

Figure 128 – Block 3&5 Harvest levels with no contribution from non-conventional

Appendix B14 – VQOs More Constraining

Even though nearly 45% of Block 1 THLB is assigned a VQO, reducing the disturbance limits to the mid-point of the percentile disturbance range reduces timber supply by only 100 m^3/year. This is due to sufficient operable inventory existing outside of VQO polygons that an alternate schedule can be created such that virtually the same harvest level is achieved.

Table 128 – Block 1 Harvest levels with VQOs more constraining

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	VQOs more constraining	Difference
1 - 25	2012	2261	435,300	435,200	- 100

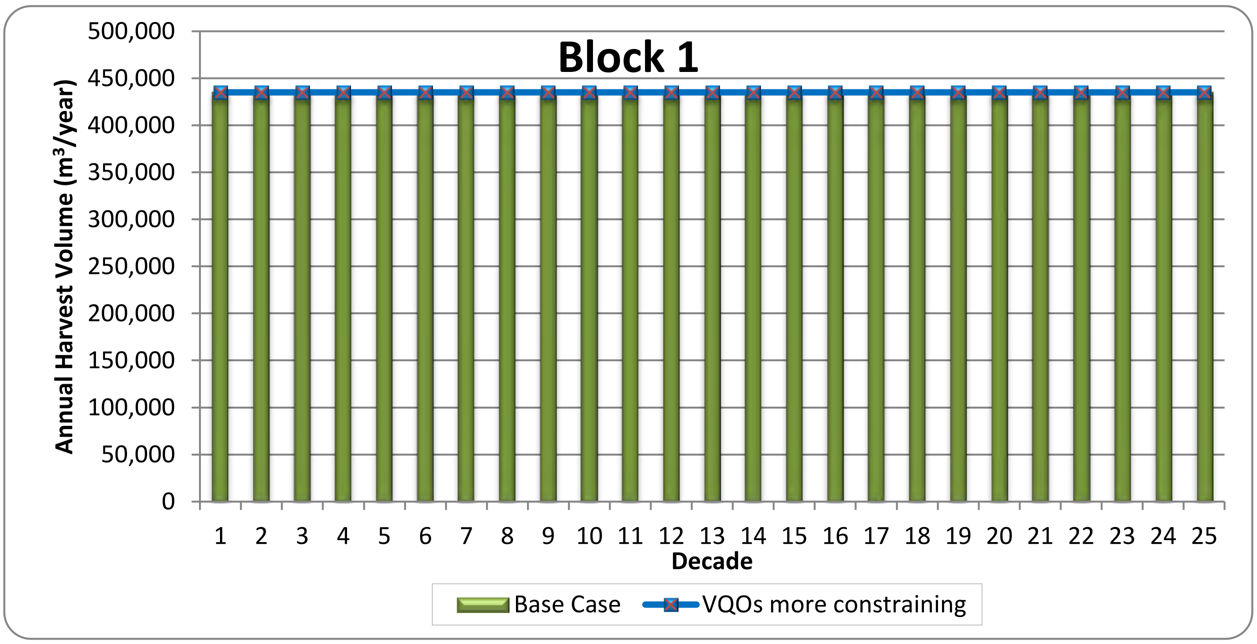

Figure 129 – Block 1 Harvest levels with VQOs more constraining

With nearly 20% of Block 2 THLB assigned to a VQO, reducing the disturbance limits has a slight timber supply impact. No difference is evident for the first 20 years as there is sufficient operable inventory outside of the VQO polygons to achieve the same short-term harvest levels. However, between Decade 3 and Decade 7, mid-term timber supply is reduced by 3,200 m^3/year (0.5%). Long-term timber supply is reduced by 1,100 m^3/year (0.1%) and total harvest is reduced by 358,000 m^3 (0.2%).

Table 129 – Block 2 Harvest levels with VQOs more constraining

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	VQOs more constraining	Difference
1	2012	2021	864,300	864,300	0
2	2022	2031	777,900	777,900	0
3 - 5	2032	2061	706,100	702,900	- 3,200
6	2062	2071	756,100	752,900	- 3,200
7	2072	2081	806,100	802,900	- 3,200
8 - 25	2082	2261	833,700	832,600	- 1,100

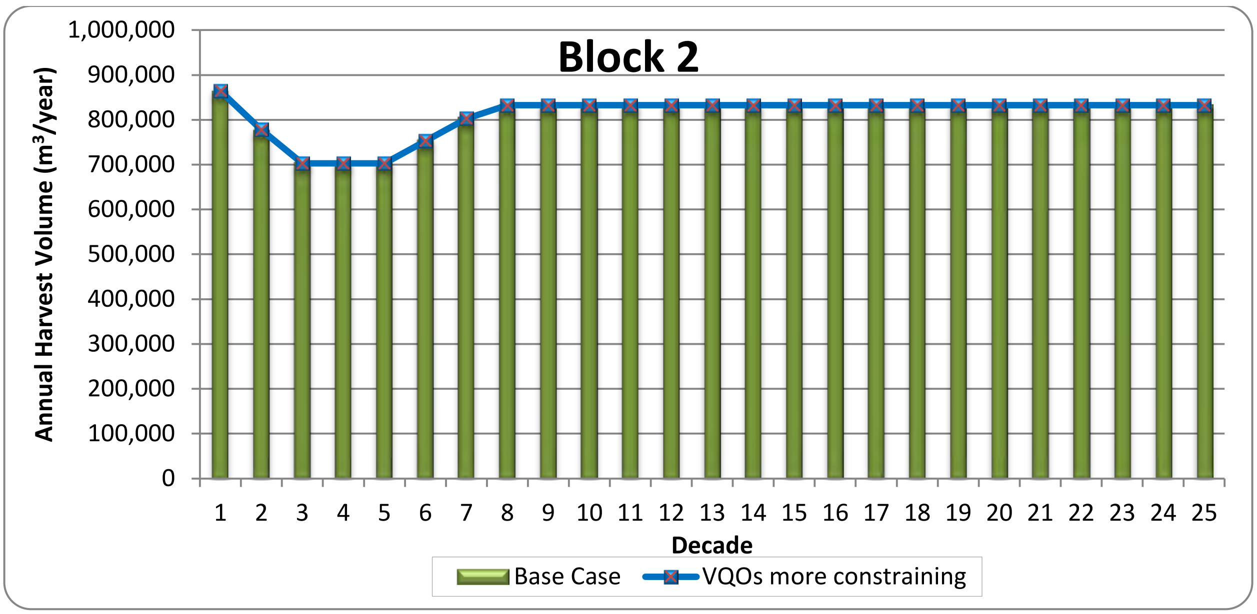

Figure 130 – Block 2 Harvest levels with VQOs more constraining

As only 1.4% of the Block 4 THLB is assigned a VQO, further constraining harvest within the VQO polygons has no timber supply impact.

Table 130 - Block 4 Harvest levels with VQOs more constraining

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	VQOs more constraining	Difference
1 - 4	2012	2051	197,000	197,000	0
5	2052	2061	216,700	216,700	0
6 - 10	2062	2111	237,300	237,300	0
11 - 25	2112	2261	249,900	249,900	0

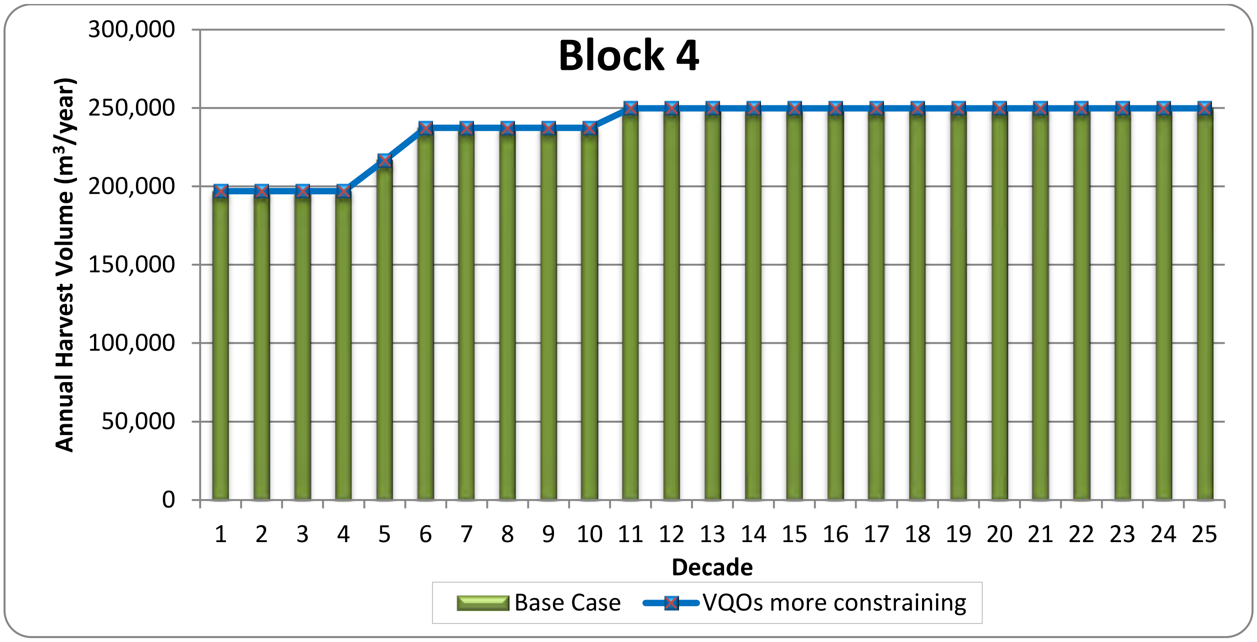

Figure 131 – Block 4 Harvest levels with VQOs more constraining

Further constraining VQO polygons within Block 3 and 5 has no impact on timber supply from these blocks.

Table 131 – Block 3&5 Harvest levels with VQOs more constraining

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1 – 7	2012	2281	41,300	41,300	0
8 - 25	2082	2261	45,000	45,000	0

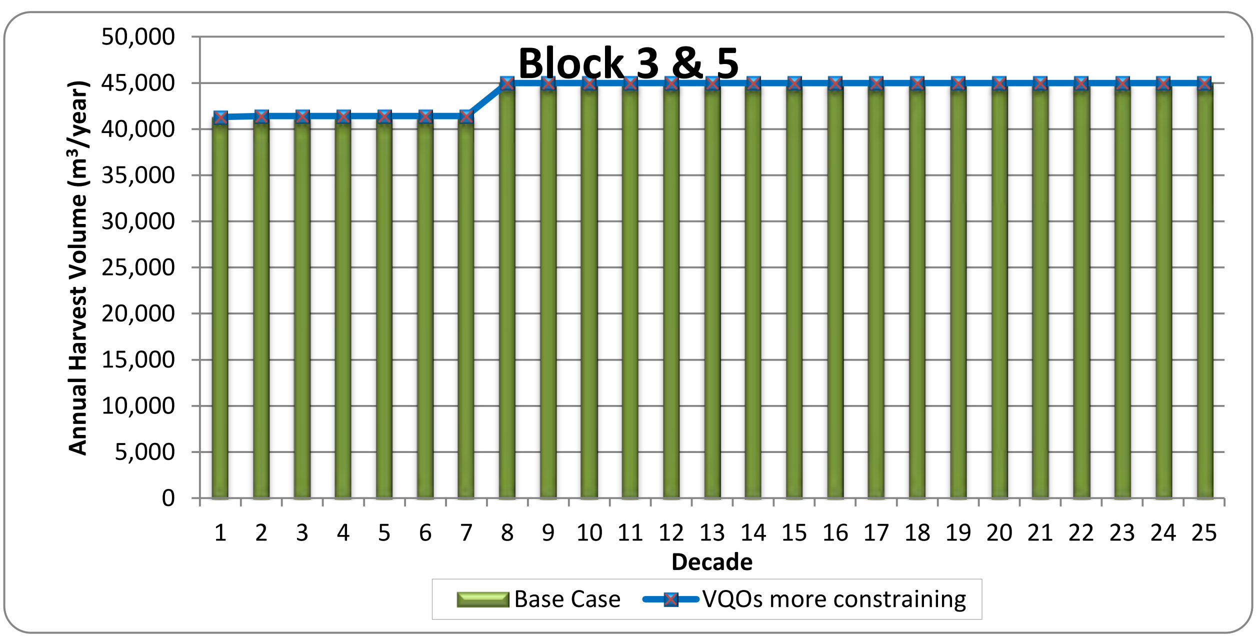

Figure 132 – Block 3&5 Harvest levels with VQOs more constraining

Appendix B15 – Remove Western Forest Strategy Impacts

Removing the area netdowns applied for the Western Forest Strategy (WFS) increases the THLB of Block 1 by 930 ha (1.9%) and THLB volume by nearly 450,000 m^3 (2.0%). Future yields are increased by 3.0% as that was the reduction applied to account for the shading effect of retained trees. Applying these changes allows timber supply to increase by 16,700 m^3/year (3.8%) to 452,000 m^3/year.

Table 132 – Block 1 Harvest levels with no Western Forest Strategy

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No WFS	Difference
1 - 25	2012	2261	435,300	452,000	+ 16,700

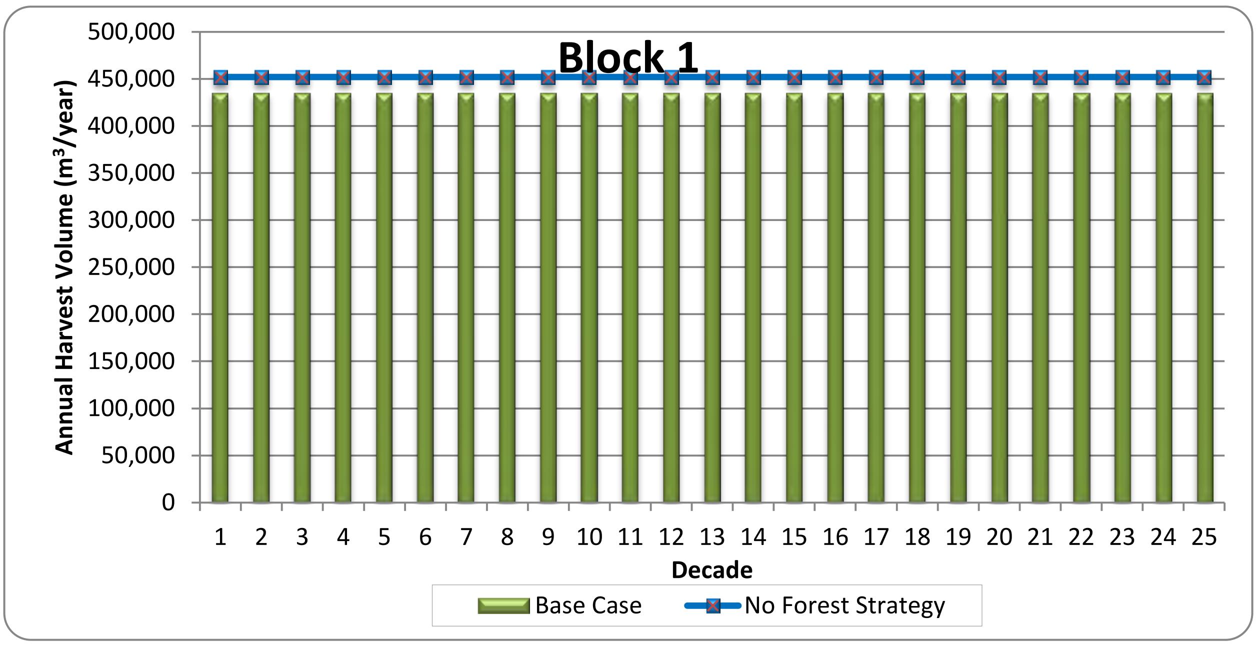

Figure 133 – Block 1 Harvest levels with no Western Forest Strategy

By not applying netdowns for the WFS within Block 2 the THLB increases by 2,445 ha (2.7%) and THLB volume by 818,350 m^3 (2.5%). Long-term yields increase with the removal of the impact from shading. These changes allow the initial harvest level to increase by 30,400 m^3/year (3.5%). Mid-term harvest improves by 21,400 m^3/year (3.0%) and long-term by 43,800 m^3/year (5.3%). Overall harvest increase by 9.53 million m^3 (4.7%). Alternatively, the larger THLB and higher future yields could be used to increase mid-term timber supply. This alternate schedule maintains the initial harvest level of the Base Case, increases mid-term harvest by 29,300 m^3/year (4.1%) and long-term harvest by 44,200 m^3/year (5.3%). Total harvest increases by 9.51 million m^3 (4.7%).

Table 133 – Block 2 Harvest levels with no Western Forest Strategy

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	No WFS	Difference	Alternate No WFS	Difference
1	2012	2021	864,300	894,700	+ 30,400	864,300	0
2	2022	2031	777,900	805,200	+ 27,300	786,800	+ 8,900
3 - 5	2032	2061	706,100	727,500	+ 21,400	735,400	+ 29,300
6	2062	2071	756,100	777,500	+ 21,400	785,400	+ 29,300
7	2072	2081	806,100	827,500	+ 21,400	835,400	+ 44,200
8 - 25	2082	2261	833,700	877,500	+ 43,800	877,900	+ 44,200

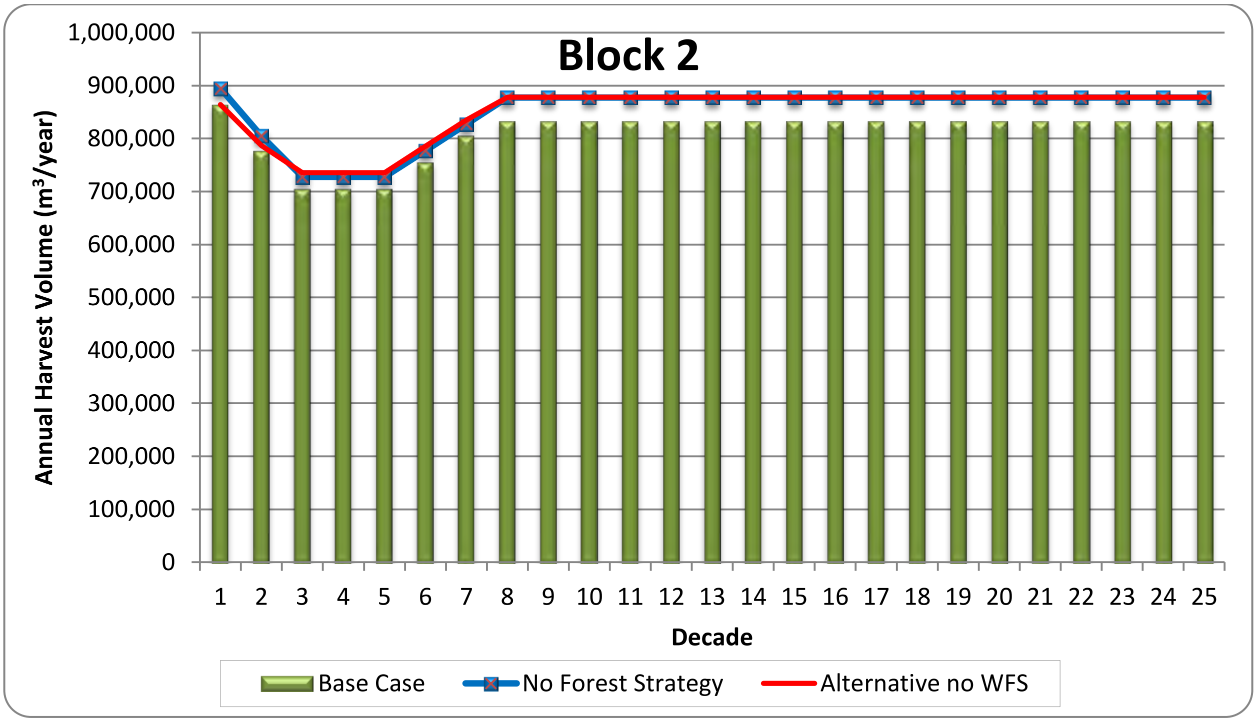

Figure 134 – Block 2 Harvest levels with no Western Forest Strategy

Block 4 THLB area increases by 412 ha (1.6%) and THLB volume by 135,000 m^3 (1.5%) when the WFS netdowns are not applied. These increases allow short-term harvest to increase by 6,000 m^3/year (3.0%), mid-term harvest to increase by 13,500 m^3/year (5.7%) and long-term harvest to increase by 11,600 m^3/year (4.6%). Total harvest increases by 2.81 million m^3 (4.7%).

Table 134 - Block 4 Harvest levels with no Western Forest Strategy

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	VQOs more constraining	Difference
1 - 3	2012	2041	197,000	203,000	+ 6,000
4	2042	2051	197,000	207,300	+10,300
5	2052	2061	216,700	228,000	+ 11,300
6 - 10	2062	2111	237,300	250,800	+ 13,500
11 - 25	2112	2261	249,900	261,500	+11,600

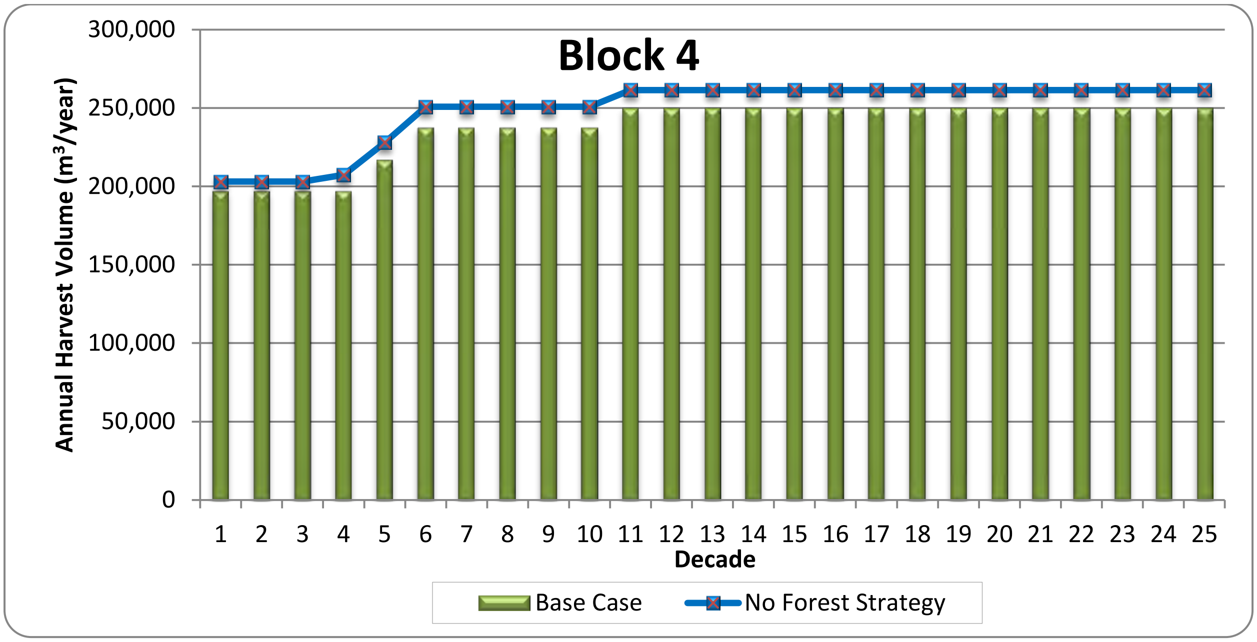

Figure 135 – Block 4 Harvest levels with no Western Forest Strategy

No netdowns were applied for the WFS in Blocks 3 and 5 due to these blocks being subject to the stand-level objectives of the South Central Coast Order. To test the impact of the yield reductions assumed to be associated with the shading effect of retained trees; this scenario was run assuming no yield effect. Long-term harvest improves by 2,000 m^3/year (4.4%) and total harvest increases by 361,000 m3 (3.3%).

Table 135 – Block 3&5 Harvest levels with no yield impact for shading from retained trees

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No Future GW	Difference
1 – 7	2012	2281	41,300	41,400	+ 100
8	2082	2091	45,000	46,400	+ 1,400
9 - 25	2092	2261	45,000	47,000	+ 2,000

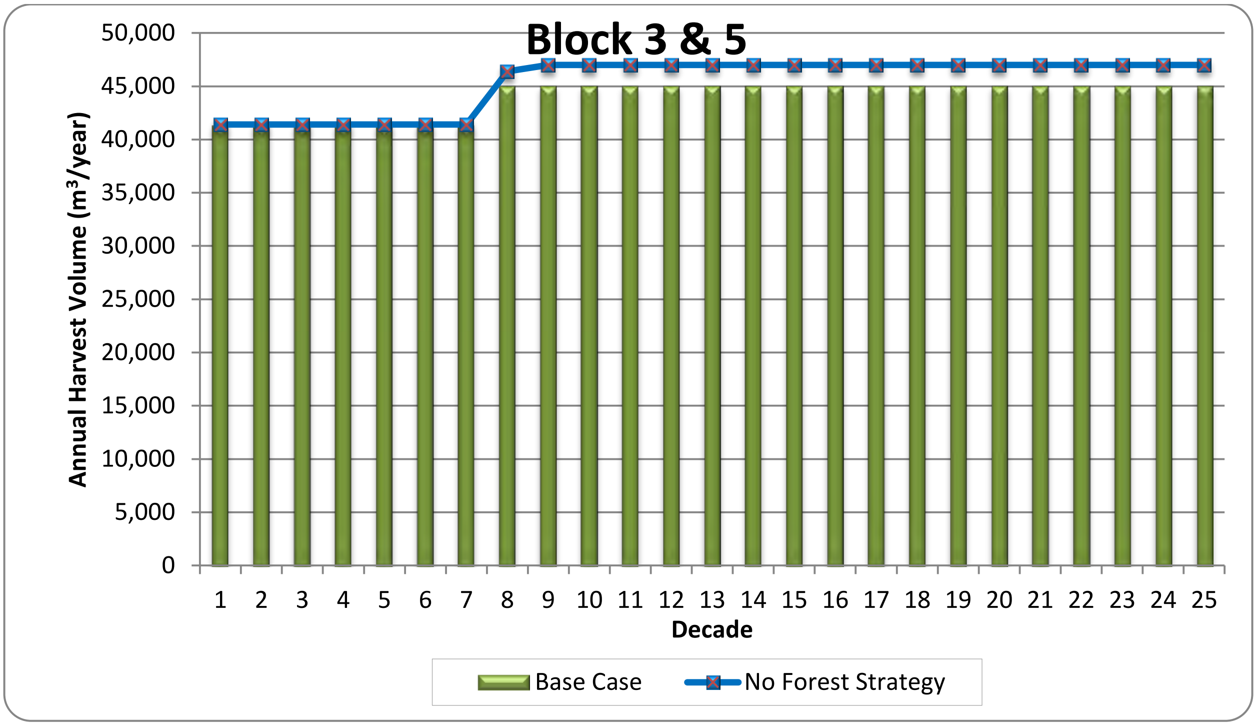

Figure 136 – Block 3&5 Harvest levels with no yield impact for shading from retained trees

Appendix B16 – Increase Minimum DBH by 2cm

Increasing the minimum average stand diameter criteria by 2 cm reduces the initial available inventory by 1.09 million m^3 (9.5%) for Block 1. The reduction to initially available inventory and the delay in availability of stands in the future creates a loss of 6,800 m^3/year (1.6%); therefore total harvest is 1.70 million m^3 less. Alternatively, the Base Case harvest level can be maintained for 20 years and then harvest must decline by 7,200 m^3/year (1.7%). Total harvest improves by 16,000 m^3 under this schedule as compared to immediately declining to the even-flow harvest.

Table 136 – Block 1 Harvest levels with Increased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Increased Minimum DBH	Difference	Alternate Increased Minimum DBH	Difference
1 - 2	2012	2031	435,300	428,500	- 6,800	435,300	0
3 – 4	2032	2051	435,300	428,500	- 6,800	426,700	- 8,600
5 - 25	2052	2261	435,300	428,500	- 6,800	428,100	- 7,200

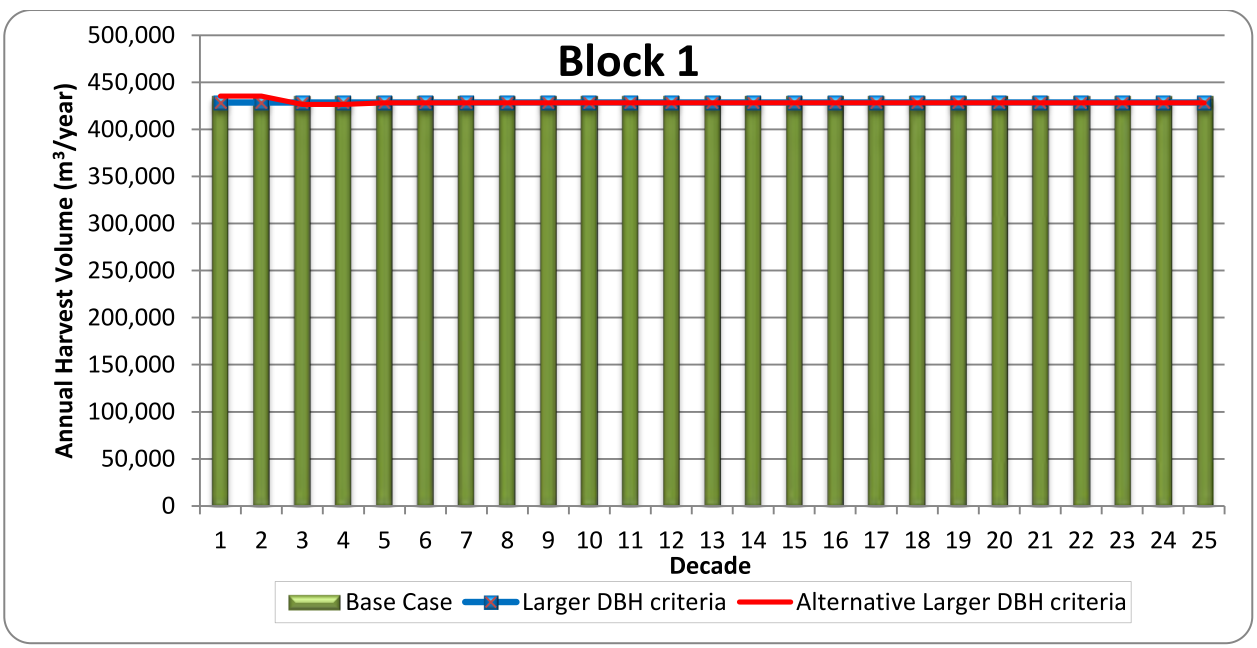

Figure 137 – Block 1 Harvest levels with Increased Minimum DBH

With minimum average stand diameter criteria increased by 2 cm, the initial available inventory in Block 2 is reduced by 1.16 million m^3 (5.8%). The reduced available inventory lessens the initial harvest by 14,300 m^3/year (1.7%), mid-term by 25,400 m^3/year (3.6%) and long-term by 3,000 m^3/year (0.4%). Total harvest declines by 2.19 million m^3 (1.1%). Alternatively, harvest in the first 20 years can be maintained at Base Case levels, then decline to a mid-term level 6,000 m^3/year (0.8%) less than the Base Case (and for an additional 10 years) and finally transition to a LTHL

5,600 m³/year (0.7%) less than the Base Case. Total harvest from this schedule is 2.43 million m³ (1.2%) less than the Base Case. The impact to long-term timber supply is less than short and mid-term impacts because the reduced short and mid-term harvest levels allow the transition to longer rotations to occur.

Table 137 – Block 2 Harvest levels with Increased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Increased Minimum DBH	Difference	Alternate Increased Minimum DBH	Difference
1	2012	2021	864,300	850,000	- 14,300	864,300	0
2	2022	2031	777,900	754,000	- 23,900	777,900	0
3 - 5	2032	2061	706,100	680,700	- 25,400	700,100	- 6,000
6	2062	2071	756,100	730,700	- 25,400	705,400	- 50,700
7	2072	2081	806,100	780,700	- 25,400	755,400	- 50,700
8	2082	2091	833,700	830,700	- 3,000	805,400	- 28,300
9 - 25	2092	2261	833,700	830,700	- 3,000	828,100	- 5,600

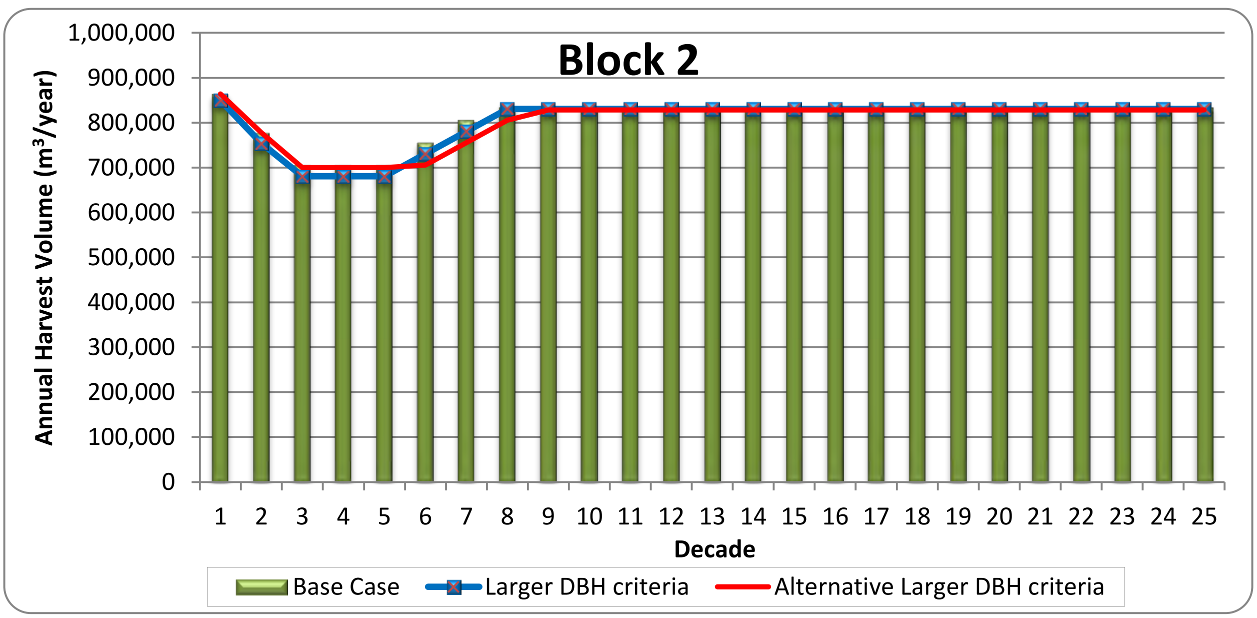

Figure 138 – Block 2 Harvest levels with Increased Minimum DBH

Larger minimum average diameter harvest criteria decreases the initial available inventory in Block 4 by 460,000 m³ (10.7%). This reduced inventory and the delay in stand availability reduces short-term timber supply by 11,300 m³/year (5.7%), mid-term timber supply by 12,600 m³/year (5.3%), and long-term timber supply by 3,100 m³/year (1.2%). Overall harvest is reduced by 1.45 million m³ (2.4%). A schedule that maintains the short-term harvest of the Base Case can be created by extending the time this harvest level applies by 10 years and transitioning to the LTHL in a more gradual manner. Relative to the Base Case, this schedule has a long-term harvest level 3,100 m³/year (1.2%) lower and reduces overall harvest by 1.45 million m³ (2.4%).

Table 138 – Block 4 Harvest levels with Increased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Increased Minimum DBH	Difference	Alternate Increased Minimum DBH	Difference
1 - 4	2012	2051	197,000	185,700	- 11,300	197,000	0
5	2052	2061	216,700	204,300	- 12,400	197,000	- 19,700
6	2062	2071	237,300	224,700	- 12,600	207,400	- 29,900
7 - 8	2072	2091	237,300	224,700	- 12,600	214,500	- 22,800
9	2092	2101	237,300	224,700	- 12,600	224,400	- 12,900
10	2102	2111	237,300	246,800	+ 9,500	246,800	+ 9,500
11 - 25	2112	2261	249,900	246,800	- 3,100	246,800	- 3,100

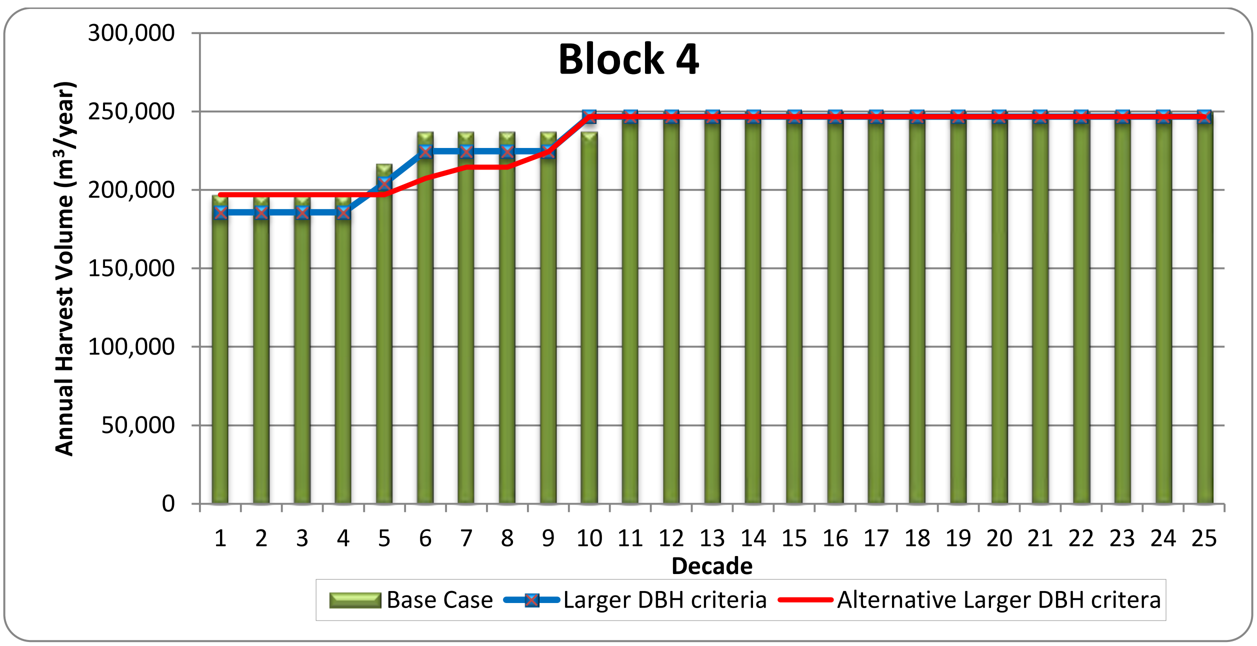

Figure 139 – Block 4 Harvest levels with Increased Minimum DBH

Initially available growing stock is reduced by 98,600 m^3 (7.7%) in Block 3 and 5 when the minimum diameter criteria is increased by 2 cm. This reduction plus the delay in availability of stands reduces short-term timber supply by 4,400 m^3/year (10.7%) and long-term timber supply by 500 m^3/year (1.1%). Total harvest declines by 424,000 m^3 (1.5%). Alternatively, the initial harvest of the Base Case can be achieved by reducing mid-term timber supply by 6,200 m^3/year (15.0%). Again, long-term supply declines by 500 m^3/year. Total harvest is reduced by 485,000 m^3 (4.4%).

Table 139 – Block 3&5 Harvest levels with Increased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Increased Minimum DBH	Difference	Alternate Increased Minimum DBH	Difference
1	2012	2021	41,300	36,900	- 4,400	41,300	0
2	2022	2031	41,300	36,900	- 4,400	37,200	- 4,100
3 - 7	2032	2081	41,300	36,900	- 4,400	35,100	- 6,200
8	2082	2091	45,000	41,900	- 4,300	40,100	- 4,900
9 - 25	2092	2261	45,000	44,500	- 500	44,500	- 500

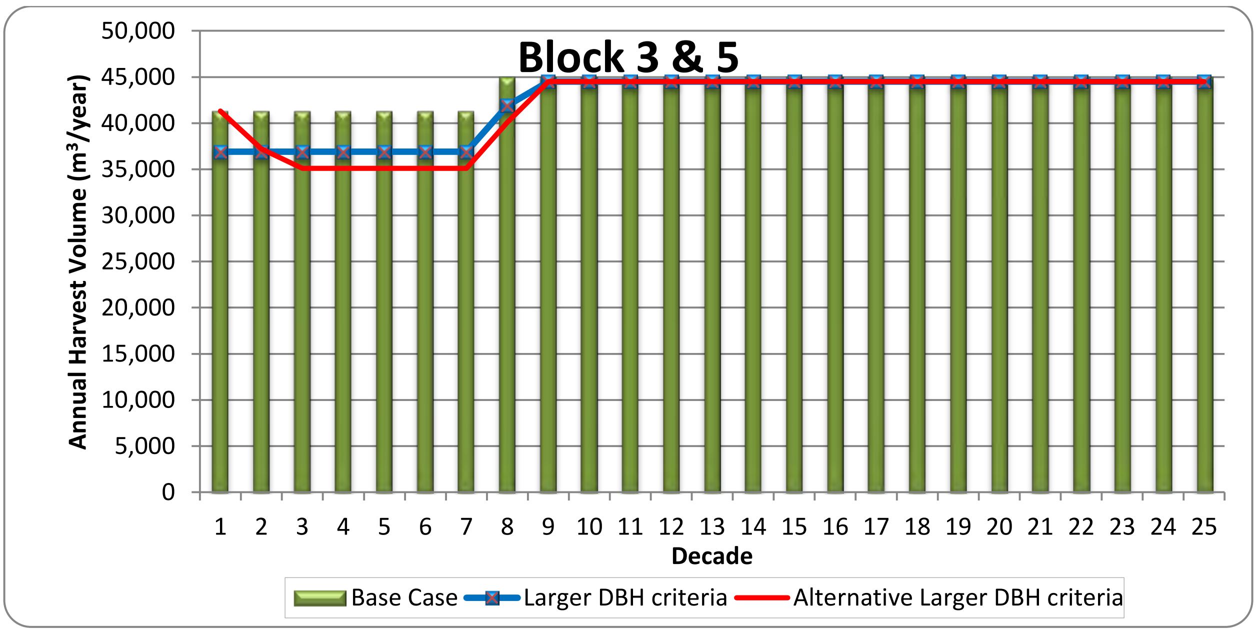

Figure 140 – Block 3&5 Harvest levels with Increased Minimum DBH

Appendix B17 – Decrease Minimum DBH by 2cm

If minimum harvest diameter criteria is decreased by 2 cm the initial available inventory in Block 1 increases by 878,200 m^3 (7.6%). This and earlier availability of stands into the future allows timber supply to improve by 2,600 m^3/year (0.6%) and total harvest increases by 650,000 m^3 (0.6%).

Table 140 – Block 1 Harvest levels with Decreased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Decreased Minimum DBH	Difference
1 - 25	2012	2261	435,300	437,900	+ 2,600

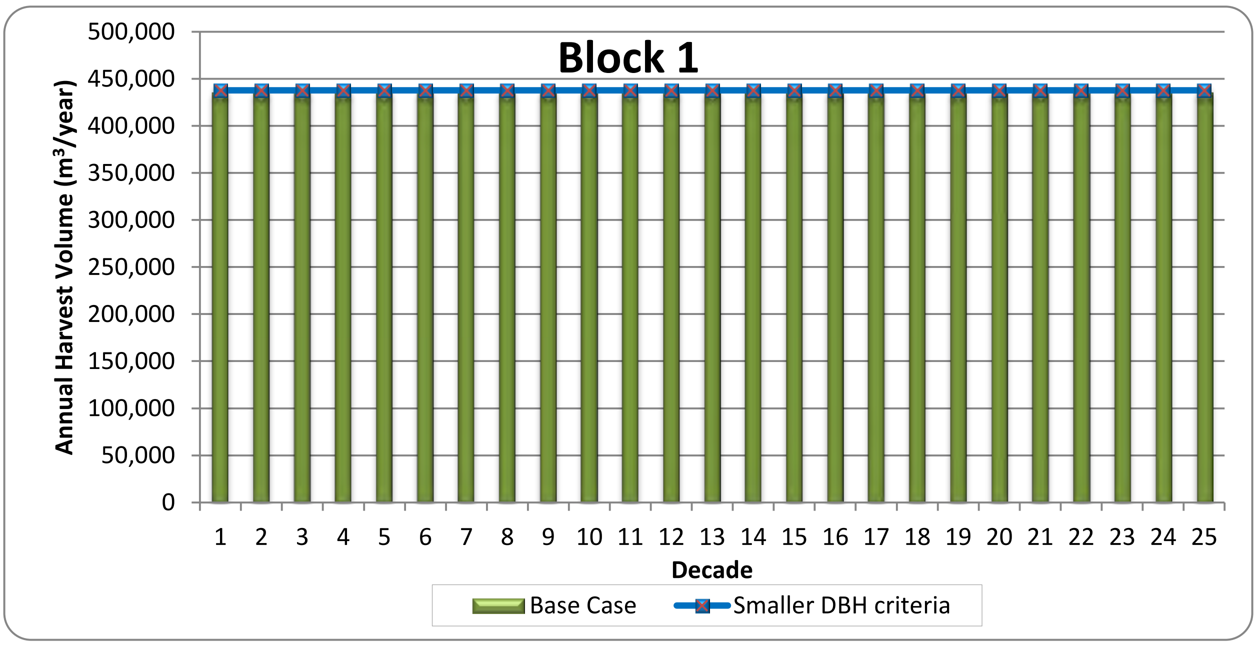

Figure 141 – Block 1 Harvest levels with Decreased Minimum DBH

By decreasing minimum diameter criteria 2 cm the initially available growing stock in Block 2 increases by 1.19 million m^3 (5.9%). This increase in available inventory, plus earlier stand availability in the future, allows short and mid-term harvest to increase by about 28,400 m^3/year (on average) and long-term to increase by 800 m^3/year (0.1%). Total harvest is increased by 2.13 million m^3 (1.0%). Alternatively, the additional inventory can be used to lessen the mid-term timber supply "dip". This alternate schedule maintains the initial harvest level of the Base Case, increases mid-term timber supply by about 32,000 m^3/year (4.5% on average), and increase LTHL by 1,000 m^3/year (0.1%). Total harvest increases by 2.10 million m^3 (1.0%).

Table 141 – Block 2 Harvest levels with Decreased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)				
			Base Case	Decreased Minimum DBH	Difference	Alternate Decreased Minimum DBH	Difference
1	2012	2021	864,300	894,100	+ 29,800	864,300	0
2	2022	2031	777,900	804,700	+ 26,800	811,200	+ 33,300
3 - 5	2032	2061	706,100	734,500	+ 28,400	738,600	+ 32,500
6	2062	2071	756,100	784,500	+ 28,400	788,600	+ 32,500
7	2072	2081	806,100	834,500	+ 28,400	834,700	+ 28,600
8 - 25	2082	2261	833,700	834,500	+ 800	834,700	+ 1,000

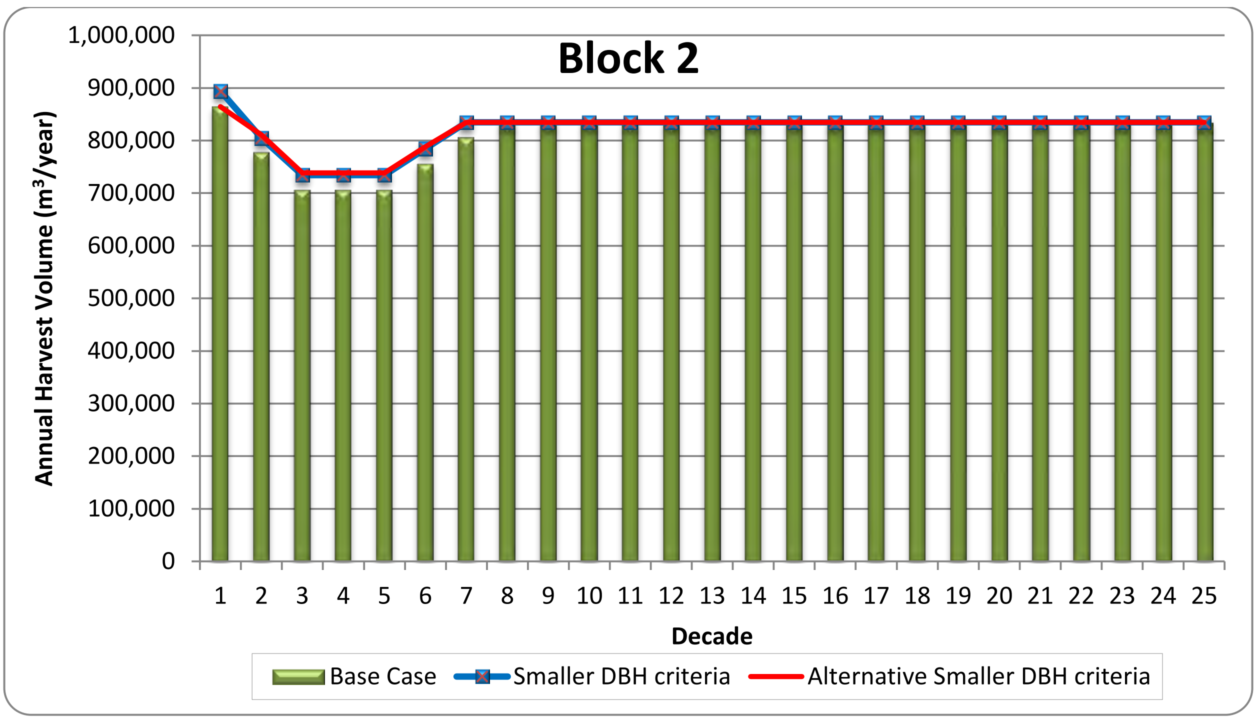

Figure 142 – Block 2 Harvest levels with Decreased Minimum DBH

Smaller harvest diameter criteria increases initially available inventory in Block 4 by 592,100 m^3 (13.8%). This permits short-term harvest to increase by 1,000 m^3/year (0.5%), mid-term harvest increase by up to 12,000 m^3/year (5.1%) and reduces LTHL by 600 m^3/year (0.2%). Total harvest increase by 681,000 m^3 (1.1%). Long-term harvest is slightly lower due to the greater mid-term harvest reducing inventory levels and shorter long-term rotations.

Table 142 – Block 4 Harvest levels with Decreased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Decreased Minimum DBH	Difference
1 - 3	2012	2041	197,000	198,000	+ 1,000
4	2042	2051	197,000	204,600	+ 7,600
5	2052	2061	216,700	225,000	+ 8,300
6	2062	2071	237,300	247,500	+ 10,200
7 – 10	2072	2101	237,300	249,300	+ 12,000
11 - 25	2112	2261	249,900	249,300	- 600

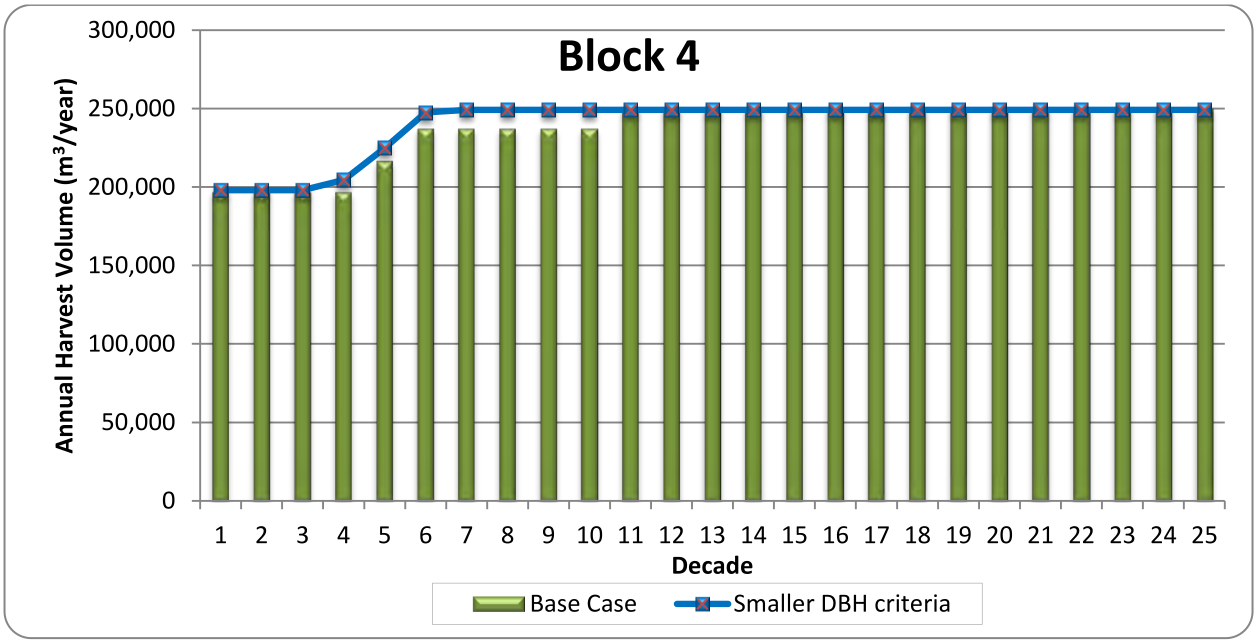

Figure 143 – Block 4 Harvest levels with Decreased Minimum DBH

If minimum harvest diameter criteria is decreased by 2 cm the initial available inventory in Block 3 and 5 increases by 54,700 m^3 (4.3%). This and earlier availability of stands into the future allows timber supply to improve by 4,100 m^3/year (9.9%) in the short and mid-term and 400 m^3/year (0.9%) in the long-term. Total harvest increases by 359,000 m^3 (3.3%).

Table 143 – Block 3&5 Harvest levels with Decreased Minimum DBH

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Decreased Minimum DBH	Difference
1 – 7	2012	2281	41,300	45,400	+ 4,100
8 - 25	2082	2261	45,000	45,400	+ 400

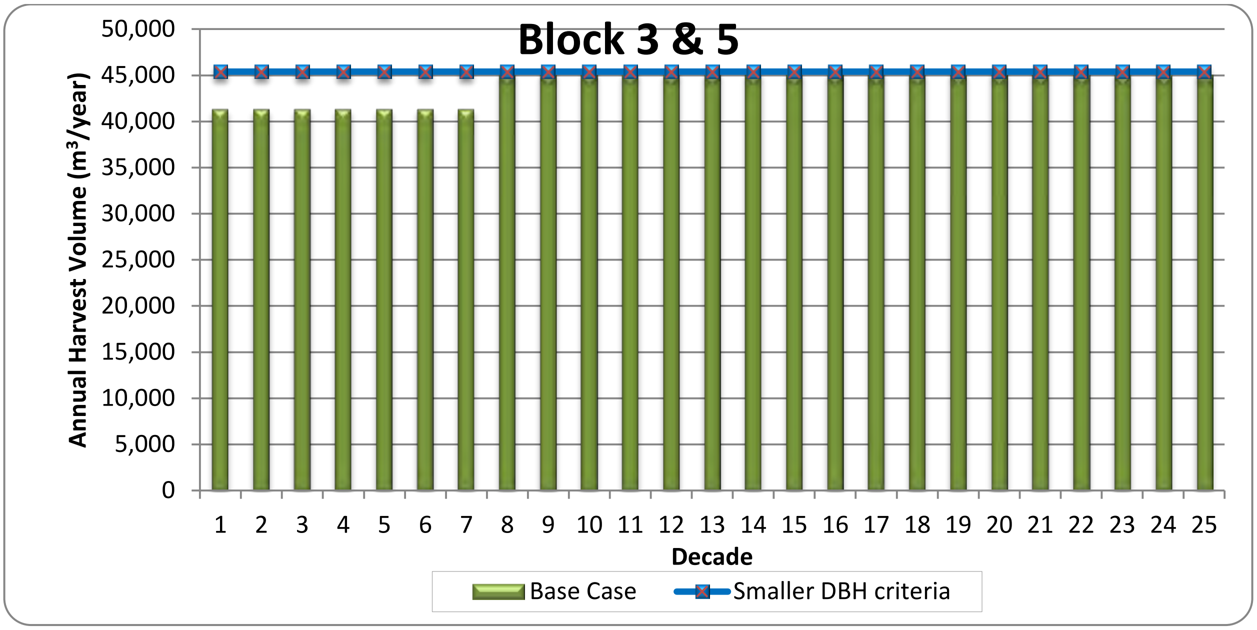

Figure 144 – Block 3&5 Harvest levels with Decreased Minimum DBH

Appendix B18 – Blocks 3 and 5 Managed Individually

Managing Block 3 and Block 5 separately greatly reduces mid-term timber supply. Harvest in Decades 5 – 7 is reduced by 10,300 m^3/year. This is not large impact at TFL-level (0.7%) but is nearly 25% less from Block 3 and 5.

Table 144 – Block 3&5 Harvest levels with block managed individually

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Blocks managed individually	Difference
1	2012	2021	41,300	40,100	- 1,200
2	2022	2031	41,300	37,500	- 3,800
3	2032	2041	41,300	35,100	- 6,200
4	2042	2051	41,300	32,900	- 8,400
5 – 7	2052	2081	41,300	31,000	- 10,300
8	2082	2091	45,000	36,000	- 9,000
9	2092	2101	45,000	41,000	- 4,000
10 - 25	2102	2261	45,000	45,000	0

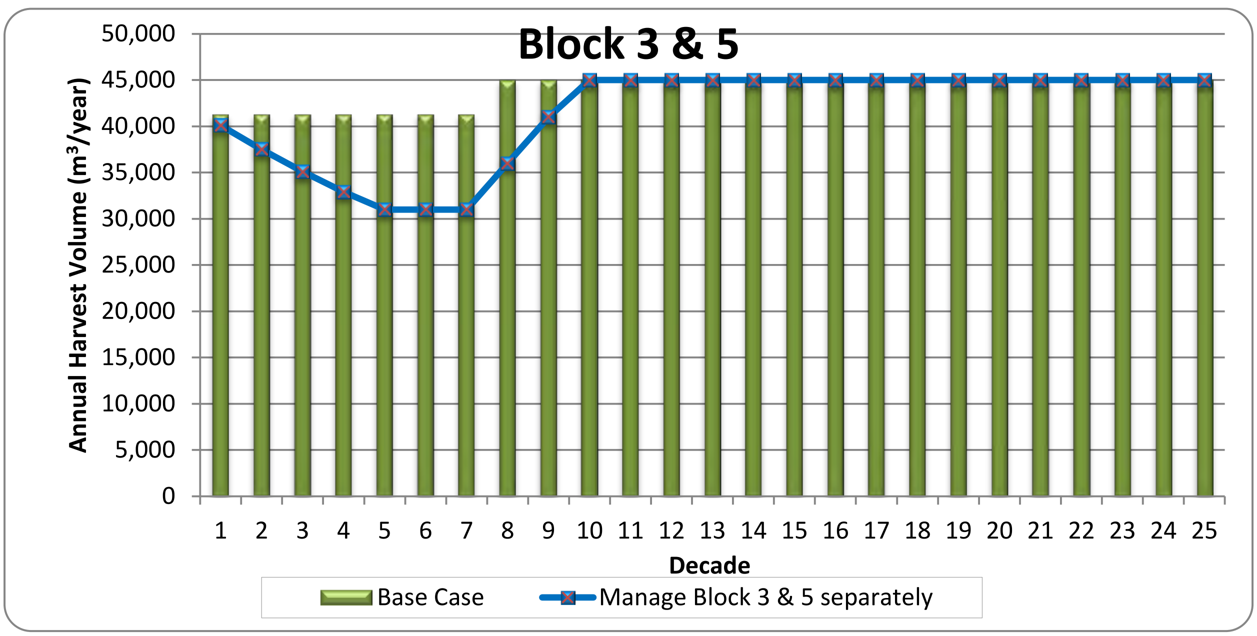

Figure 145 – Block 3&5 Harvest levels with block managed individually

Table 145 – Block 3 Harvest levels with block managed individually

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Blocks managed individually	Difference
1	2012	2021	20,900	26,600	+ 5,700
2	2022	2031	30,700	23,900	- 6,800
3	2032	2041	28,800	21,500	- 7,300
4	2042	2051	30,500	19,400	- 11,100
5	2052	2061	14,800	17,400	+ 2,600
6	2062	2071	700	17,400	+ 16,700
7	2072	2081	16,500	17,400	+ 900
8	2082	2091	14,900	17,400	+ 2,500
9	2092	2101	12,900	17,400	+ 4,500
10	2102	2111	9,300	17,400	+ 8,100
11	2112	2121	29,800	17,400	- 12,400
12	2122	2131	33,200	17,400	- 15,800
13	2132	2141	22,200	17,400	- 4,800
14	2142	2151	7,700	17,400	+ 9,700
15	2152	2161	17,300	17,400	+ 100
16	2162	2171	9,000	17,400	+ 8,400
17	2172	2181	3,400	17,400	+ 14,000
18	2182	2191	12,800	17,400	+ 4,600
19	2192	2201	23,600	17,400	- 6,200
20	2202	2211	38,700	17,400	- 21,300
21	2212	2221	28,300	17,400	- 10,900
22	2222	2231	11,000	17,400	+ 6,400
23	2232	2241	6,800	17,400	+ 10,600
24	2242	2251	10,000	17,400	+ 7,400
25	2252	2261	12,800	17,400	+ 4,600

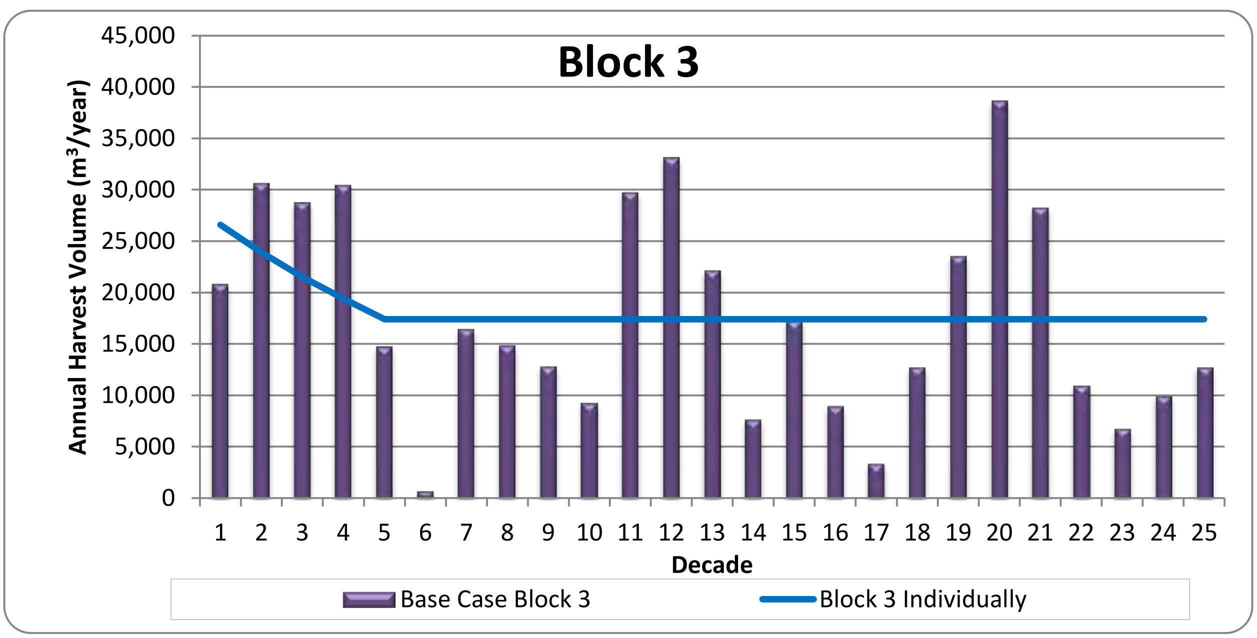

Figure 146 – Block 3 Harvest levels with blocks managed individually

Table 146 – Block 5 Harvest levels with block managed individually

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Blocks managed individually	Difference
1	2012	2021	20,400	13,600	- 6,800
2	2022	2031	10,600	13,600	+ 3,000
3	2032	2041	12,600	13,600	+ 1,000
4	2042	2051	10,900	13,600	+ 2,700
5	2052	2061	26,600	13,600	- 13,000
6	2062	2071	40,600	13,600	- 27,000
7	2072	2081	24,900	13,600	- 11,300
8	2082	2091	30,000	18,600	- 11,400
9	2092	2101	32,100	23,600	- 8,500
10	2102	2111	35,600	27,500	- 8,100
11	2112	2121	15,200	27,500	+ 12,300
12	2122	2131	11,800	27,500	+ 15,700
13	2132	2141	22,800	27,500	+ 4,700
14	2142	2151	37,200	27,500	- 9,700
15	2152	2161	27,600	27,500	- 100
16	2162	2171	36,000	27,500	- 8,500
17	2172	2181	41,600	27,500	- 14,100
18	2182	2191	32,100	27,500	- 4,600
19	2192	2201	21,400	27,500	+ 6,100
20	2202	2211	6,300	27,500	+ 21,200
21	2212	2221	16,600	27,500	+ 10,900
22	2222	2231	34,000	27,500	- 6,500
23	2232	2241	38,100	27,500	- 10,600
24	2242	2251	34,900	27,500	- 7,400
25	2252	2261	32,100	27,500	- 4,600

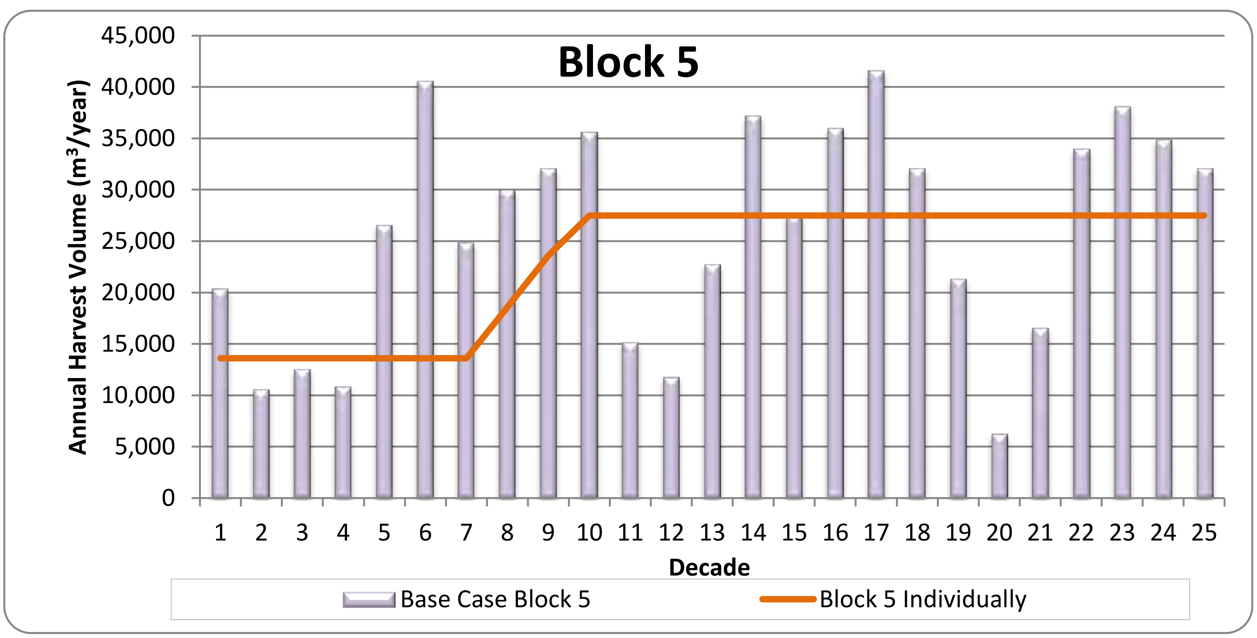

Figure 147 – Block 5 Harvest levels with block managed individually

Appendix B19 – SCCO Old Seral Targets Addressed Aspatially

Meeting the old seral objectives aspatially reduces short-term harvest by 700 m^3/year (1.7%) but increases long-term harvest opportunity by 6,400 m^3/year (14.2%).

Table 147 – Block 3&5 Harvest levels with old seral addressed aspatially

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Aspatial Old Seral	Difference
1 - 7	2012	2081	41,300	40,600	- 700
8	2082	2091	45,000	45,600	+ 600
9	2092	2101	45,000	50,600	+ 5,600
10 - 25	2102	2261	45,000	51,400	+ 6,400

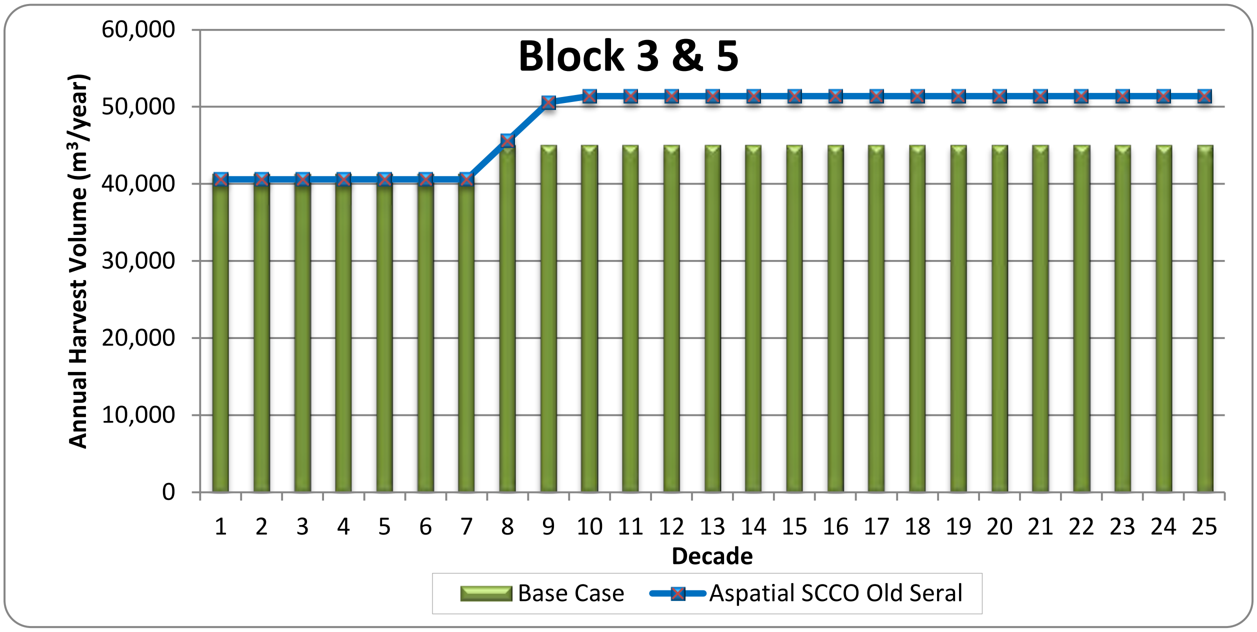

Figure 148 – Block 3&5 Harvest levels with old seral addressed aspatially

Table 148 – Block 3 Harvest levels with old seral addressed aspatially

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Aspatial Old Seral	Difference
1	2012	2021	20,900	11,600	- 9,300
2	2022	2031	30,700	23,400	- 7,300
3	2032	2041	28,800	25,400	- 3,400
4	2042	2051	30,500	27,700	- 2,800
5	2052	2061	14,800	23,600	+ 8,800
6	2062	2071	700	18,200	+ 17,500
7	2072	2081	16,500	23,700	+ 7,200
8	2082	2091	14,900	18,900	+ 4,000
9	2092	2101	12,900	3,300	- 9,600
10	2102	2111	9,300	500	- 8,800
11	2112	2121	29,800	29,600	- 200
12	2122	2131	33,200	34,200	+ 1,000
13	2132	2141	22,200	32,700	+ 10,500
14	2142	2151	7,700	16,600	+ 8,900
15	2152	2161	17,300	4,800	- 12,500
16	2162	2171	9,000	21,700	+ 12,700
17	2172	2181	3,400	30,400	+ 27,000
18	2182	2191	12,800	6,700	- 6,100
19	2192	2201	23,600	20,700	- 2,900
20	2202	2211	38,700	38,600	- 100
21	2212	2221	28,300	21,100	- 7,200
22	2222	2231	11,000	30,500	+ 19,500
23	2232	2241	6,800	5,200	- 1,600
24	2242	2251	10,000	6,100	- 3,900
25	2252	2261	12,800	5,500	- 7,300

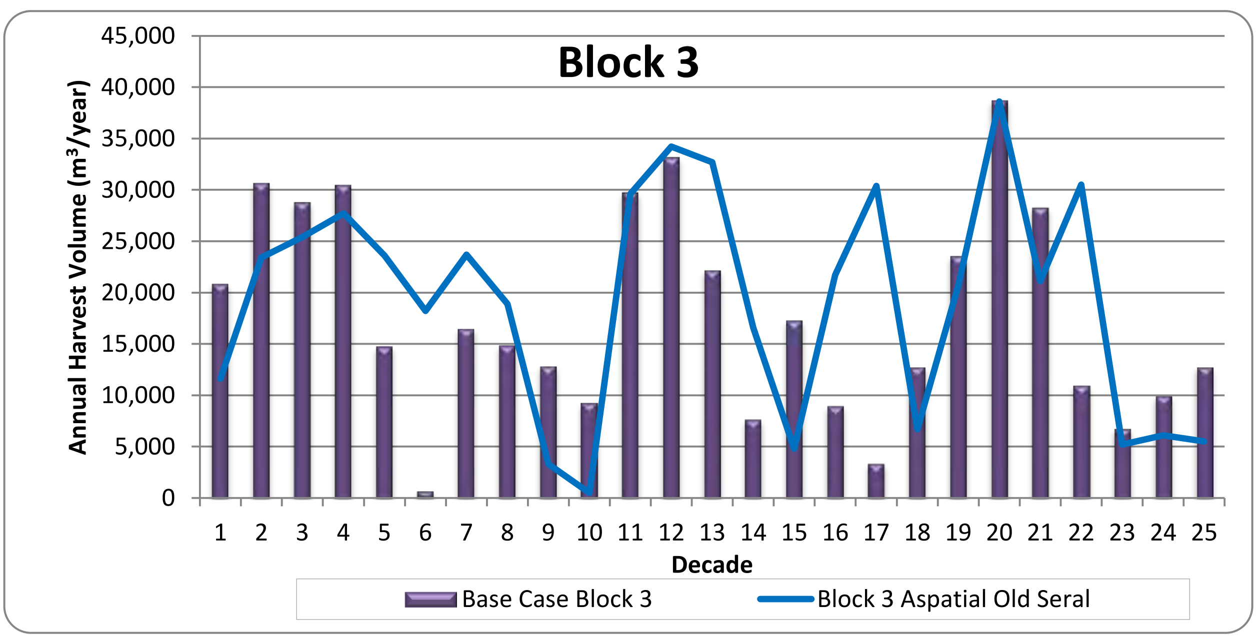

Figure 149 – Block 3 Harvest levels with old seral addressed aspatially

Table 149 – Block 5 Harvest levels with old seral addressed aspatially

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Aspatial Old Seral	Difference
1	2012	2021	20,400	29,100	+ 8,700
2	2022	2031	10,600	17,300	+ 6,700
3	2032	2041	12,600	15,200	+ 2,600
4	2042	2051	10,900	12,900	+ 2,000
5	2052	2061	26,600	17,000	- 9,600
6	2062	2071	40,600	22,400	- 18,200
7	2072	2081	24,900	17,000	- 7,900
8	2082	2091	30,000	26,700	- 3,300
9	2092	2101	32,100	47,300	+ 15,200
10	2102	2111	35,600	50,800	+ 15,200
11	2112	2121	15,200	21,800	+ 6,600
12	2122	2131	11,800	17,100	+ 5,300
13	2132	2141	22,800	18,600	- 4,200
14	2142	2151	37,200	34,800	- 2,400
15	2152	2161	27,600	46,500	+ 18,900
16	2162	2171	36,000	29,600	- 6,400
17	2172	2181	41,600	21,000	- 20,600
18	2182	2191	32,100	44,600	+ 12,500
19	2192	2201	21,400	30,700	+ 9,300
20	2202	2211	6,300	12,700	+ 6,400
21	2212	2221	16,600	30,300	+ 13,700
22	2222	2231	34,000	20,900	- 13,100
23	2232	2241	38,100	46,100	+ 8,000
24	2242	2251	34,900	45,200	+ 10,300
25	2252	2261	32,100	45,900	+ 13,800

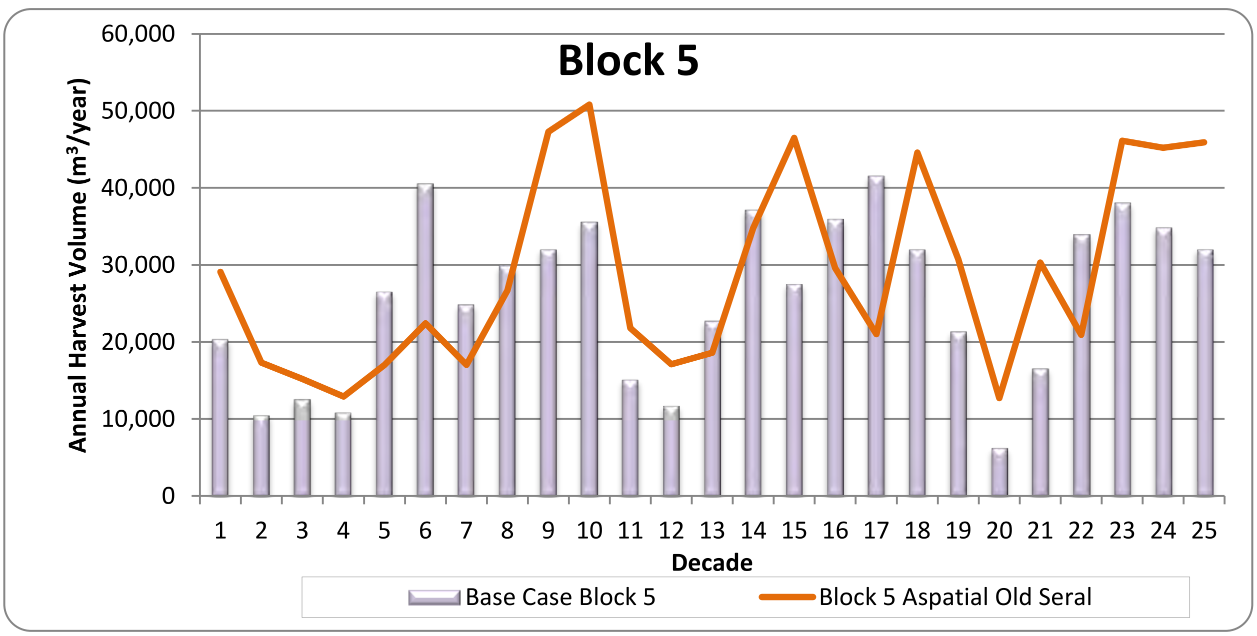

Figure 150 – Block 5 Harvest levels with old seral addressed aspatially

Appendix B20 – SCCO Risk-managed Old Seral Targets

Reducing the old seral targets in Block 5 (Phillips landscape unit) to 30% RONV increases short-term harvest from Block 3 and 5 by 6,100 m^3/year (14.8%) and long-term harvest by 16,700 m^3/year (37.1%). Total harvest is increased by 3.30 million m^3 (30.0%).

Table 150 – Block 3&5 Harvest levels with risk-managed old seral targets

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Aspatial Old Seral	Difference
1 - 7	2012	2081	41,300	47,400	+ 6,100
8	2082	2091	45,000	52,400	+ 7,400
9	2092	2101	45,000	57,400	+ 12,400
10 - 25	2102	2261	45,000	61,700	+ 16,700

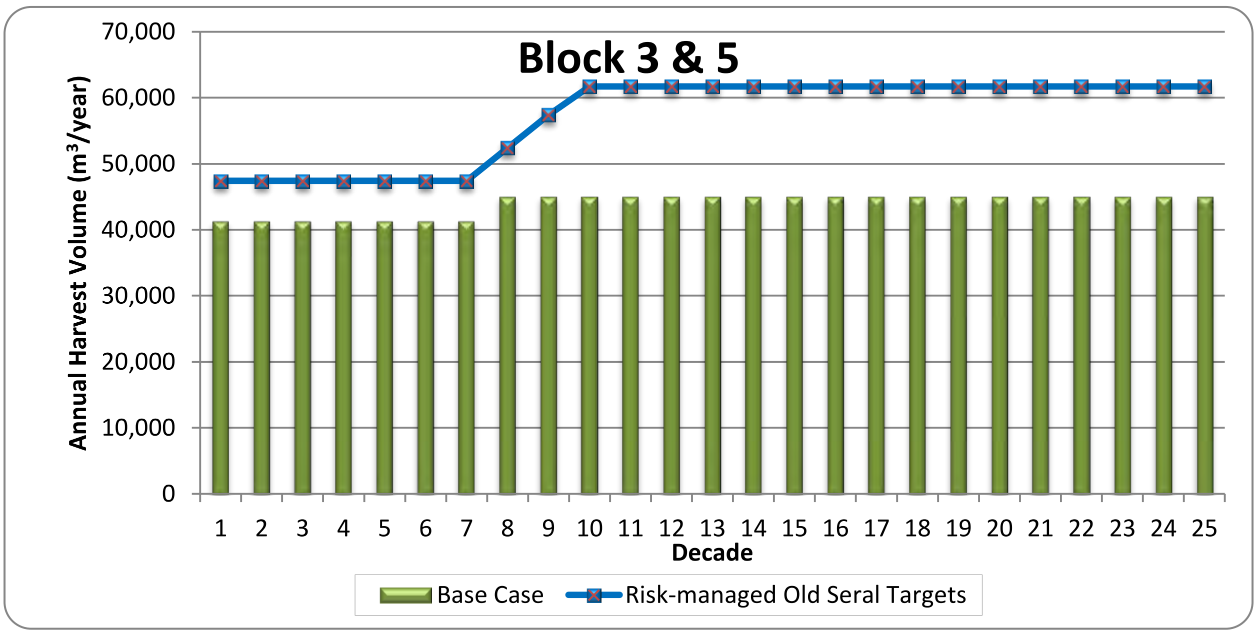

Figure 151 – Block 3&5 Harvest levels with risk-managed old seral targets

Table 151 – Block 3 Harvest levels with risk-managed old seral targets

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	Risk-managed Old Seral	Difference
1	2012	2021	20,900	6,100	- 14,800
2	2022	2031	30,700	32,200	+ 1,500
3	2032	2041	28,800	29,300	+ 500
4	2042	2051	30,500	29,900	- 600
5	2052	2061	14,800	18,300	+ 3,500
6	2062	2071	700	0	- 700
7	2072	2081	16,500	27,000	+ 10,500
8	2082	2091	14,900	8,600	- 6,300
9	2092	2101	12,900	4,500	- 8,400
10	2102	2111	9,300	0	- 9,300
11	2112	2121	29,800	30,400	+ 600
12	2122	2131	33,200	42,100	+ 8,900
13	2132	2141	22,200	17,200	- 5,000
14	2142	2151	7,700	6,700	- 1,000
15	2152	2161	17,300	25,600	+ 8,300
16	2162	2171	9,000	26,800	+ 17,800
17	2172	2181	3,400	27,600	+ 24,200
18	2182	2191	12,800	7,100	- 5,700
19	2192	2201	23,600	16,800	- 6,800
20	2202	2211	38,700	52,000	+ 13,300
21	2212	2221	28,300	24,900	- 3,400
22	2222	2231	11,000	5,700	- 5,300
23	2232	2241	6,800	12,800	+ 6,000
24	2242	2251	10,000	21,900	+ 11,900
25	2252	2261	12,800	27,700	+ 14,900

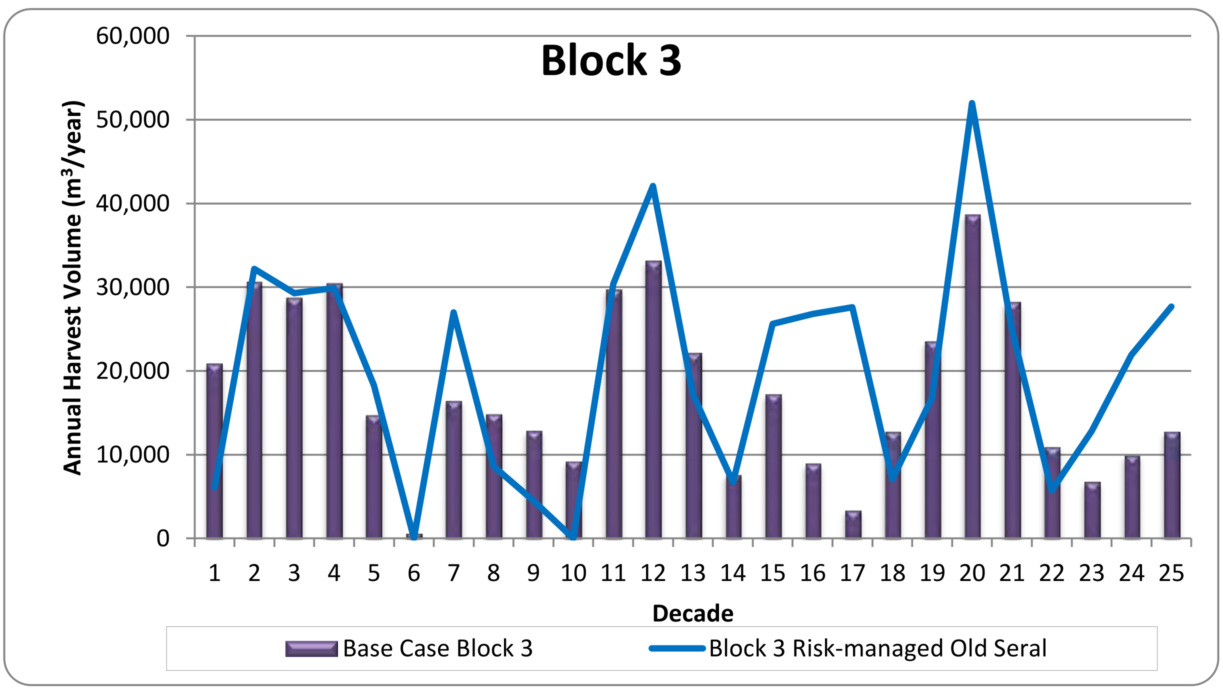

Figure 152 – Block 3 Harvest levels with risk-managed old seral targets

Table 152 – Block 5 Harvest levels with risk-managed old seral targets

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	Risk-managed Old Seral	Difference
1	2012	2021	20,400	41,400	+ 21,000
2	2022	2031	10,600	15,200	+ 4,600
3	2032	2041	12,600	18,200	+ 5,600
4	2042	2051	10,900	17,600	+ 6,700
5	2052	2061	26,600	29,200	+ 2,600
6	2062	2071	40,600	47,400	+ 6,800
7	2072	2081	24,900	20,400	- 4,500
8	2082	2091	30,000	43,900	+ 13,900
9	2092	2101	32,100	52,900	+ 20,800
10	2102	2111	35,600	61,700	+ 26,100
11	2112	2121	15,200	31,300	+ 16,100
12	2122	2131	11,800	19,600	+ 7,800
13	2132	2141	22,800	44,400	+ 21,600
14	2142	2151	37,200	55,000	+ 17,800
15	2152	2161	27,600	36,100	+ 8,500
16	2162	2171	36,000	34,900	- 1,100
17	2172	2181	41,600	34,100	- 7,500
18	2182	2191	32,100	54,600	+ 22,500
19	2192	2201	21,400	44,900	+ 23,500
20	2202	2211	6,300	9,700	+ 3,400
21	2212	2221	16,600	36,800	+ 20,200
22	2222	2231	34,000	56,000	+ 22,000
23	2232	2241	38,100	48,900	+ 10,800
24	2242	2251	34,900	39,800	+ 4,900
25	2252	2261	32,100	34,000	+ 1,900

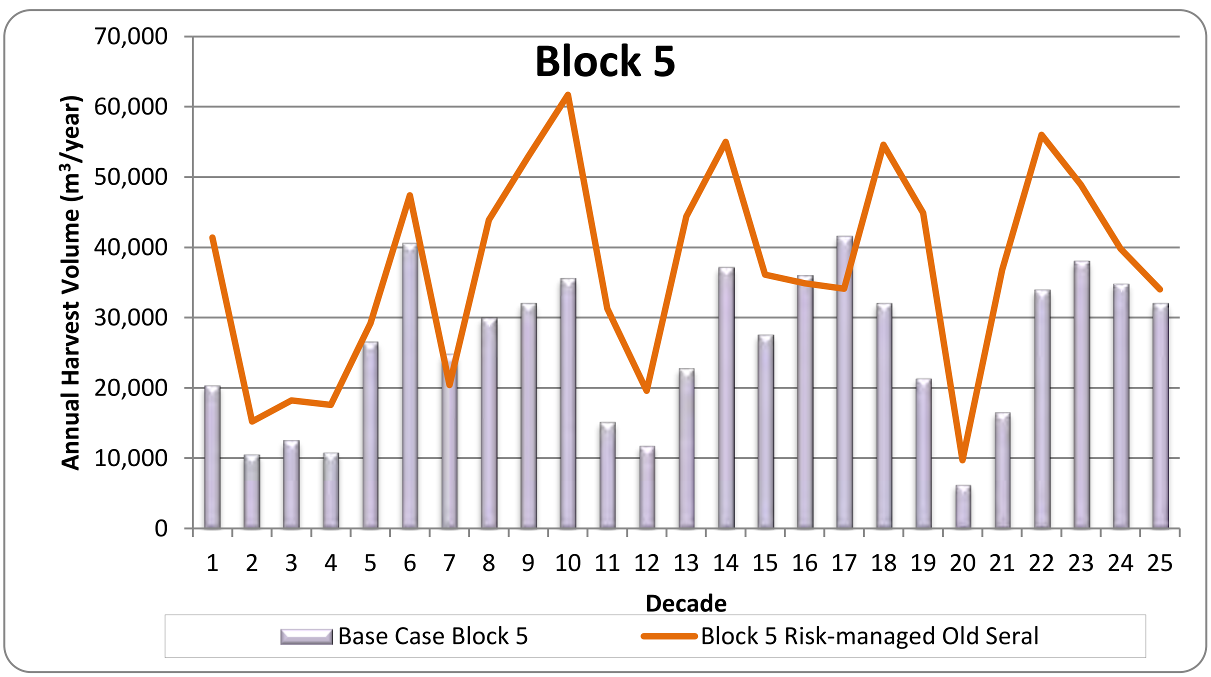

Figure 153 – Block 5 Harvest levels with risk-managed old seral targets

Appendix B21 – Phillips Old Seral Targets based on 50% RONV

Reducing the old seral targets in Block 5 (Phillips landscape unit) to 50% RONV increase short-term harvest from Block 3 and 5 by 3,100 m^3/year (7.5%) and long-term harvest by 13,100 m^3/year (29.1%). Total harvest is increased by 2.45 million m^3 (22.3%).

Table 153 – Block 3&5 Harvest levels with 50% RONV old seral targets in Block 5

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	50% RONV Targets for Block 5	Difference
1 - 7	2012	2081	41,300	44,400	+ 3,100
8	2082	2091	45,000	49,400	+ 4,400
9	2092	2101	45,000	54,400	+ 9,400
10 - 25	2102	2261	45,000	58,100	+ 13,100

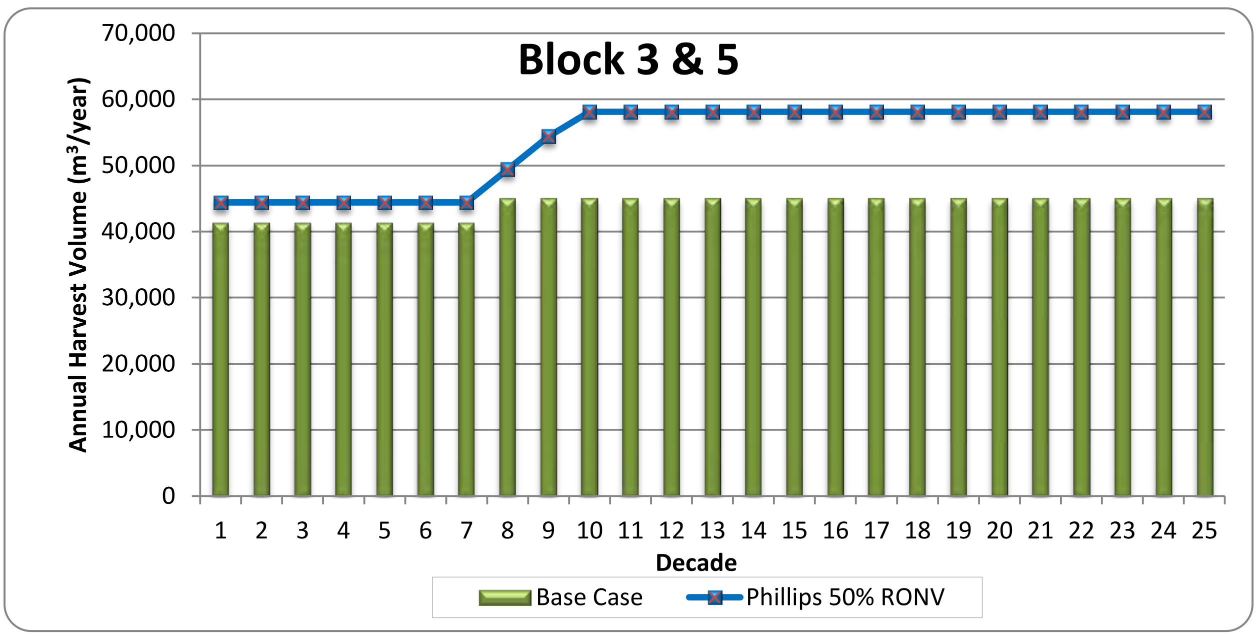

Figure 154 – Block 3&5 Harvest levels with 50% RONV old seral targets in Block 5

Table 154 – Block 3 Harvest levels with 50% RONV old seral targets in Block 5

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	50% RONV Targets for Block 5	Difference
1	2012	2021	20,900	10,700	- 10,200
2	2022	2031	30,700	25,300	- 5,400
3	2032	2041	28,800	28,600	- 200
4	2042	2051	30,500	29,500	- 1,000
5	2052	2061	14,800	23,500	+ 8,700
6	2062	2071	700	800	+ 100
7	2072	2081	16,500	31,600	+ 15,100
8	2082	2091	14,900	18,600	+ 3,700
9	2092	2101	12,900	4,400	- 8,500
10	2102	2111	9,300	0	- 9,300
11	2112	2121	29,800	22,200	- 7,600
12	2122	2131	33,200	34,000	+ 800
13	2132	2141	22,200	29,000	+ 6,800
14	2142	2151	7,700	14,100	+ 6,400
15	2152	2161	17,300	7,500	- 9,800
16	2162	2171	9,000	32,100	+ 23,100
17	2172	2181	3,400	33,200	+ 29,800
18	2182	2191	12,800	6,200	- 6,600
19	2192	2201	23,600	18,600	- 5,000
20	2202	2211	38,700	41,400	+ 2,700
21	2212	2221	28,300	20,500	- 7,800
22	2222	2231	11,000	27,400	+ 16,400
23	2232	2241	6,800	4,400	- 2,400
24	2242	2251	10,000	4,500	- 5,500
25	2252	2261	12,800	20,800	+ 8,000

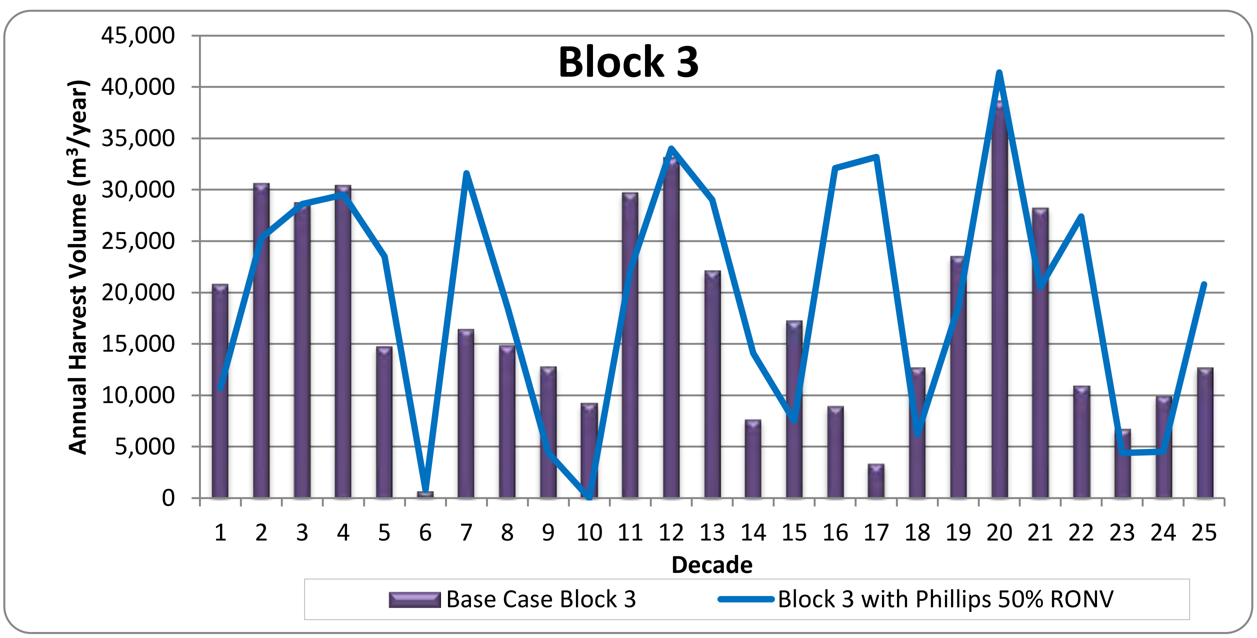

Figure 155 – Block 3 Harvest levels with 50% RONV old seral targets in Block 5

Table 155 – Block 5 Harvest levels with 50% RONV old seral targets in Block 5

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	50% RONV Targets for Block 5	Difference
1	2012	2021	20,400	33,700	+ 13,300
2	2022	2031	10,600	19,100	+ 8,500
3	2032	2041	12,600	15,800	+ 3,200
4	2042	2051	10,900	14,900	+ 4,000
5	2052	2061	26,600	20,900	- 5,700
6	2062	2071	40,600	43,600	+ 3,000
7	2072	2081	24,900	12,800	- 12,100
8	2082	2091	30,000	30,800	+ 800
9	2092	2101	32,100	50,000	+ 17,900
10	2102	2111	35,600	58,100	+ 22,500
11	2112	2121	15,200	36,000	+ 20,800
12	2122	2131	11,800	24,100	+ 12,300
13	2132	2141	22,800	29,100	+ 6,300
14	2142	2151	37,200	44,000	+ 6,800
15	2152	2161	27,600	50,600	+ 23,000
16	2162	2171	36,000	26,100	- 9,900
17	2172	2181	41,600	25,000	- 16,600
18	2182	2191	32,100	51,900	+ 19,800
19	2192	2201	21,400	39,600	+ 18,200
20	2202	2211	6,300	16,800	+ 10,500
21	2212	2221	16,600	37,600	+ 21,000
22	2222	2231	34,000	30,700	- 3,300
23	2232	2241	38,100	53,700	+ 15,600
24	2242	2251	34,900	53,600	+ 18,700
25	2252	2261	32,100	37,400	+ 5,300

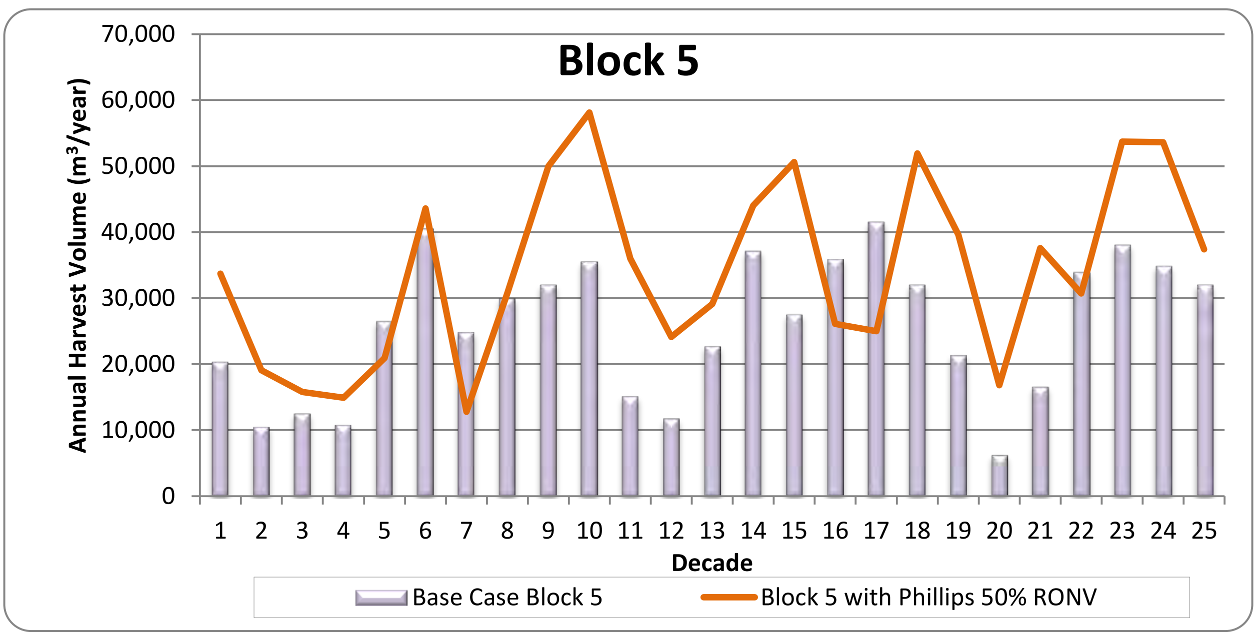

Figure 156 – Block 5 Harvest levels with 50% RONV old seral targets in Block 5

Appendix B22 – No South Central Coast Order Netdowns

Removing the netdowns associated with the SCCO increases short-term harvest from Block 3 and 5 by 18,300 m^3/year (44.3%) and long-term harvest by 20,200 m^3/year (44.9%). Total harvest is increased by 4.91 million m^3 (44.7%).

Table 156 – Block 3&5 Harvest levels with no SCCO order

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No SCCO Order	Difference
1 - 7	2012	2081	41,300	59,600	+ 18,300
8	2082	2091	45,000	64,600	+ 19,600
9 - 25	2092	2261	45,000	65,200	+ 20,200

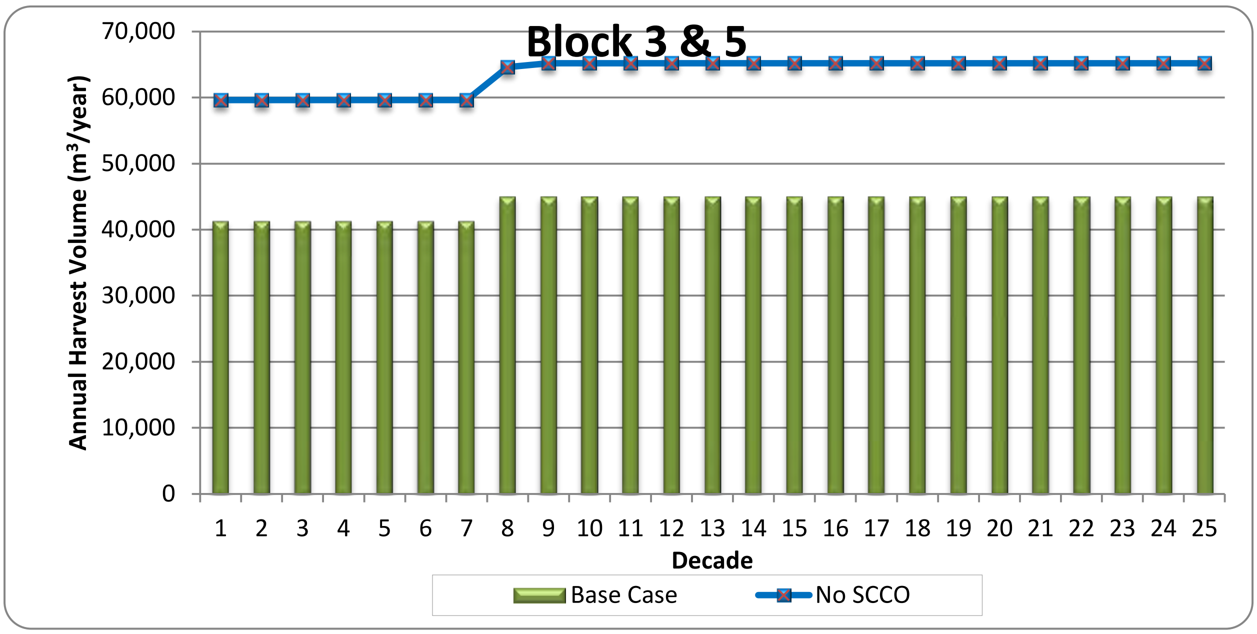

Figure 157 – Block 3&5 Harvest levels with no SCCO order

Table 157 – Block 3 Harvest levels with no SCCO order

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			Base Case	No SCCO Order	Difference
1	2012	2021	20,900	21,000	+ 100
2	2022	2031	30,700	30,400	- 300
3	2032	2041	28,800	47,400	+ 18,600
4	2042	2051	30,500	38,200	+ 7,700
5	2052	2061	14,800	22,400	+ 7,600
6	2062	2071	700	2,100	+ 1,400
7	2072	2081	16,500	13,500	- 3,000
8	2082	2091	14,900	33,800	+ 18,900
9	2092	2101	12,900	12,700	- 200
10	2102	2111	9,300	1,800	- 7,500
11	2112	2121	29,800	44,700	+ 14,900
12	2122	2131	33,200	47,200	+ 14,000
13	2132	2141	22,200	22,700	+ 500
14	2142	2151	7,700	9,000	+ 1,300
15	2152	2161	17,300	25,200	+ 7,900
16	2162	2171	9,000	15,300	+ 6,300
17	2172	2181	3,400	12,000	+ 8,600
18	2182	2191	12,800	12,200	- 600
19	2192	2201	23,600	24,900	+ 1,300
20	2202	2211	38,700	55,800	+ 17,100
21	2212	2221	28,300	19,700	- 8,600
22	2222	2231	11,000	31,400	+ 20,400
23	2232	2241	6,800	8,300	+ 1,500
24	2242	2251	10,000	13,300	+ 3,300
25	2252	2261	12,800	18,500	+ 5,700

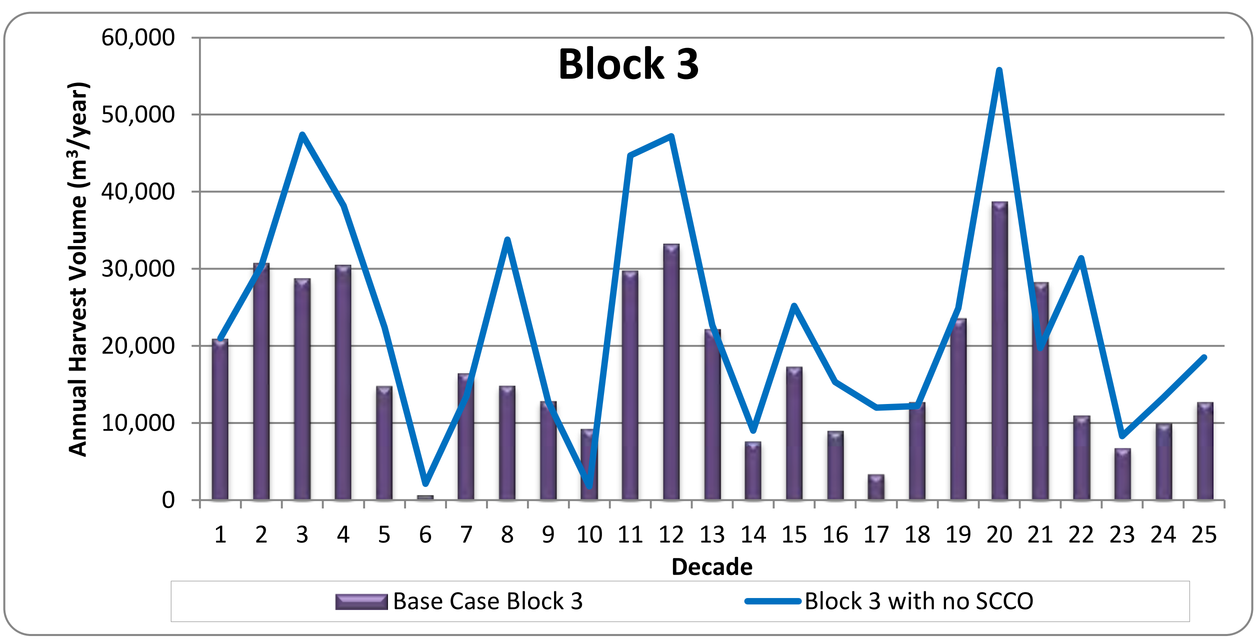

Figure 158 – Block 3 Harvest levels with no SCCO order

Table 158 – Block 5 Harvest levels with no SCCO order

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) Base Case	No SCCO Order	Difference
1	2012	2021	20,400	38,600	+ 18,200
2	2022	2031	10,600	29,200	+ 18,600
3	2032	2041	12,600	12,200	- 400
4	2042	2051	10,900	21,300	+ 10,400
5	2052	2061	26,600	37,100	+ 10,500
6	2062	2071	40,600	57,400	+ 16,800
7	2072	2081	24,900	46,100	+ 21,200
8	2082	2091	30,000	30,800	+ 800
9	2092	2101	32,100	52,500	+ 20,400
10	2102	2111	35,600	63,400	+ 27,800
11	2112	2121	15,200	20,500	+ 5,300
12	2122	2131	11,800	18,000	+ 6,200
13	2132	2141	22,800	42,500	+ 19,700
14	2142	2151	37,200	56,200	+ 19,000
15	2152	2161	27,600	40,000	+ 12,400
16	2162	2171	36,000	49,900	+ 13,900
17	2172	2181	41,600	53,200	+ 11,600
18	2182	2191	32,100	53,000	+ 20,900
19	2192	2201	21,400	40,300	+ 18,900
20	2202	2211	6,300	9,400	+ 3,100
21	2212	2221	16,600	45,500	+ 28,900
22	2222	2231	34,000	33,800	- 200
23	2232	2241	38,100	56,900	+ 18,800
24	2242	2251	34,900	51,900	+ 17,000
25	2252	2261	32,100	46,700	+ 14,600

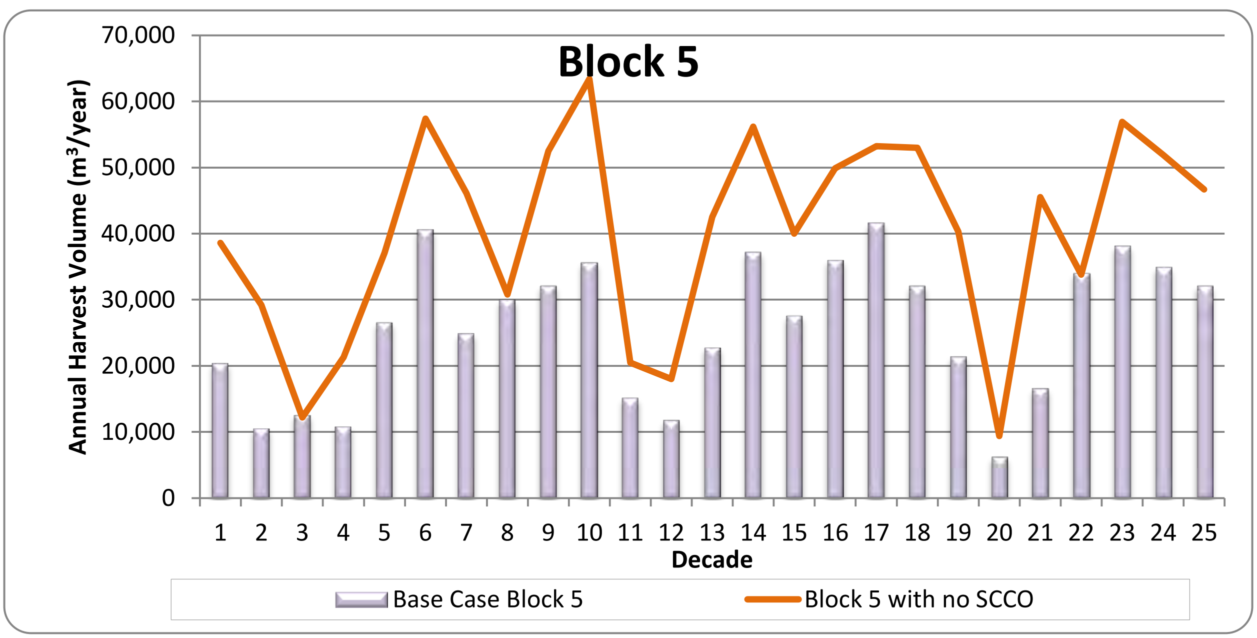

Figure 159 – Block 5 Harvest levels with no SCCO order

Appendix B23 – No South Central Coast Order and no Non-conventional Restriction

Removing the netdowns associated with the SCCO and the non-conventional constraint increases the initial harvest from Block 3 and 5 by 46,700 m^3/year (102.9%) when compared to the scenario where the SCCO applied but the non-conventional constraint did not. Long-term harvest increases by 35,600 m^3/year (77.9%). Total harvest is increased by 9.05 million m^3 (79.4%).

Table 159 – Block 3&5 Harvest levels with no SCCO order or non-conventional restriction

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			SCCO Order without non-conventional restriction	No SCCO Order and no non-conventional restriction	Difference
1	2012	2021	45,400	92,100	+ 46,700
2	2022	2031	45,400	82,900	+ 37,500
3 - 7	2032	2081	45,400	81,300	+ 35,900
8 - 25	2082	2261	45,700	81,300	+ 35,600

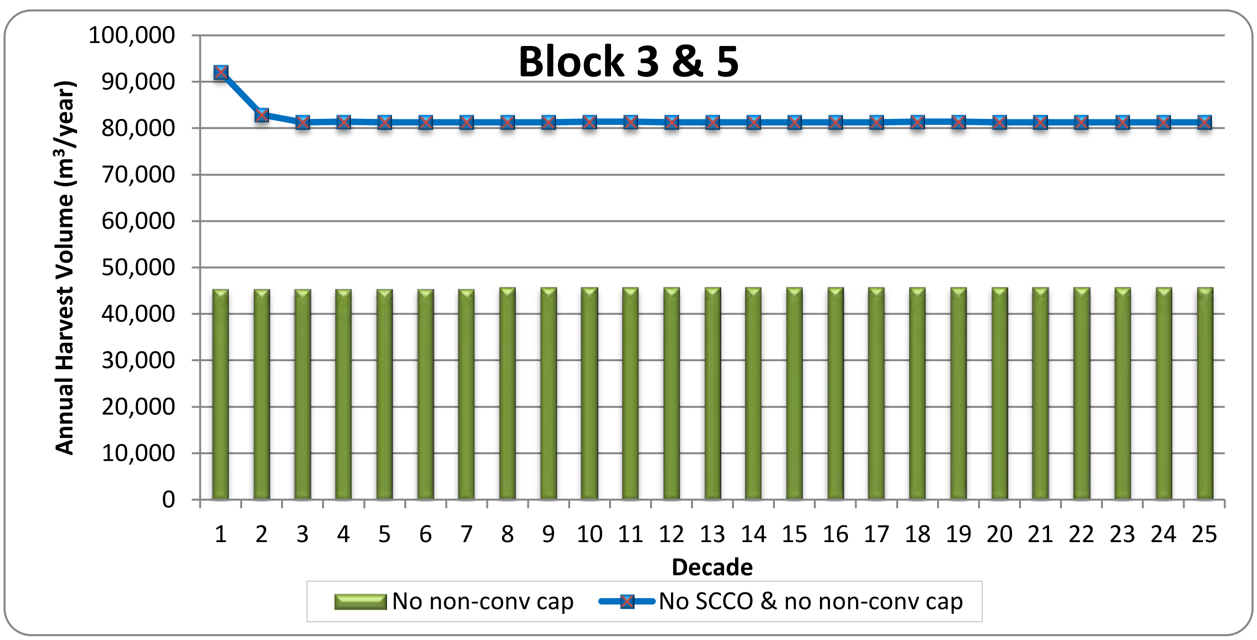

Figure 160 – Block 3&5 Harvest levels with no SCCO order or non-conventional restriction

Table 160 – Block 3 Harvest levels with no SCCO order or non-conventional restriction

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3)		
			SCCO Order without non-conventional restriction	No SCCO Order and no non-conventional restriction	Difference
1	2012	2021	16,700	27,400	+ 10,700
2	2022	2031	17,200	2,700	- 14,500
3	2032	2041	37,000	3,800	- 33,200
4	2042	2051	40,300	73,400	+ 33,100
5	2052	2061	18,300	43,700	+ 25,400
6	2062	2071	1,700	1,300	- 400
7	2072	2081	15,500	40,500	+ 25,000
8	2082	2091	16,900	13,800	- 3,100
9	2092	2101	19,900	31,100	+ 11,200
10	2102	2111	13,400	20,000	+ 6,600
11	2112	2121	27,400	37,600	+ 10,200
12	2122	2131	36,600	26,300	- 10,300
13	2132	2141	21,400	50,900	+ 29,500
14	2142	2151	3,700	13,300	+ 9,600
15	2152	2161	3,500	100	- 3,400
16	2162	2171	2,600	2,200	- 400
17	2172	2181	5,600	2,200	- 3,400
18	2182	2191	24,800	17,500	- 7,300
19	2192	2201	20,900	28,700	+ 7,800
20	2202	2211	43,800	54,900	+ 11,100
21	2212	2221	23,100	16,900	- 6,200
22	2222	2231	15,500	57,000	+ 41,500
23	2232	2241	6,300	13,300	+ 7,000
24	2242	2251	4,200	8,200	+ 4,000
25	2252	2261	12,900	12,700	- 200

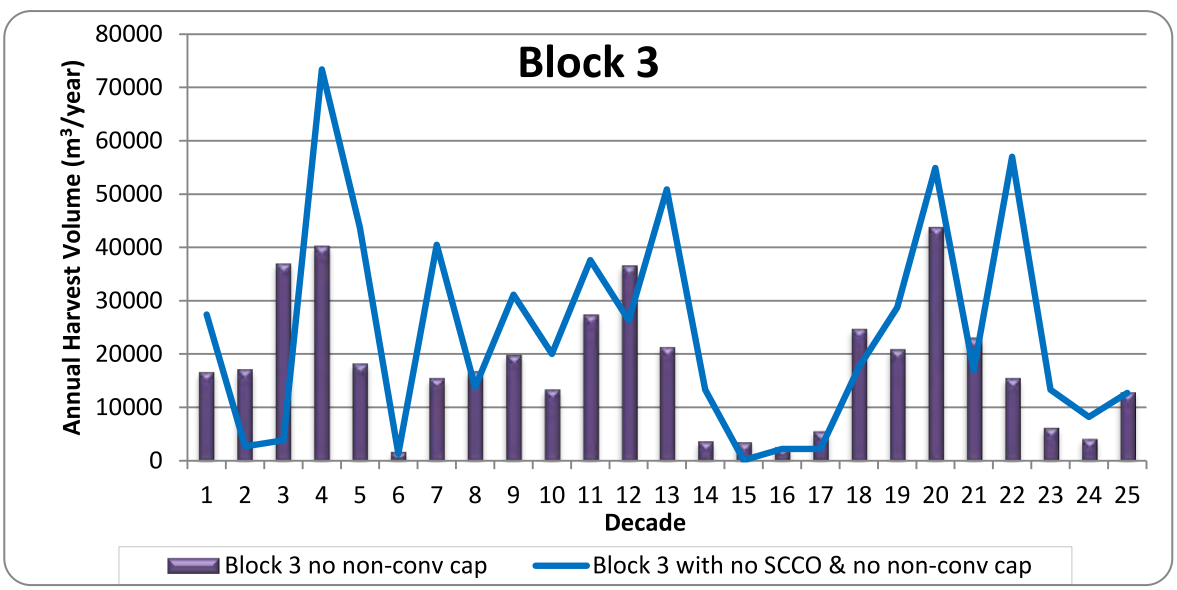

Figure 161 – Block 3 Harvest levels with no SCCO order or non-conventional restriction

Table 161 – Block 5 Harvest levels with no SCCO order or non-conventional restriction

Period (Decade #)	Start Year	End Year	Annual Harvest Volume (m^3) SCCO Order without non-conventional restriction	No SCCO Order and no non-conventional restriction	Difference
1	2012	2021	28,700	64,700	+ 36,000
2	2022	2031	28,100	80,200	+ 52,100
3	2032	2041	8,300	77,500	+ 69,200
4	2042	2051	5,100	8,000	+ 2,900
5	2052	2061	27,100	37,600	+ 10,500
6	2062	2071	43,700	80,000	+ 36,300
7	2072	2081	29,900	40,800	+ 10,900
8	2082	2091	28,800	67,500	+ 38,700
9	2092	2101	25,700	50,200	+ 24,500
10	2102	2111	32,300	61,400	+ 29,100
11	2112	2121	18,300	43,800	+ 25,500
12	2122	2131	9,000	55,000	+ 46,000
13	2132	2141	24,300	30,400	+ 6,100
14	2142	2151	42,000	68,000	+ 26,000
15	2152	2161	42,100	81,200	+ 39,100
16	2162	2171	43,000	79,100	+ 36,100
17	2172	2181	40,100	79,100	+ 39,000
18	2182	2191	20,800	63,900	+ 43,100
19	2192	2201	24,800	52,700	+ 27,900
20	2202	2211	1,900	26,400	+ 24,500
21	2212	2221	22,500	64,400	+ 41,900
22	2222	2231	30,200	24,300	- 5,900
23	2232	2241	39,300	68,000	+ 28,700
24	2242	2251	41,400	73,100	+ 31,700
25	2252	2261	32,800	68,600	+ 35,800

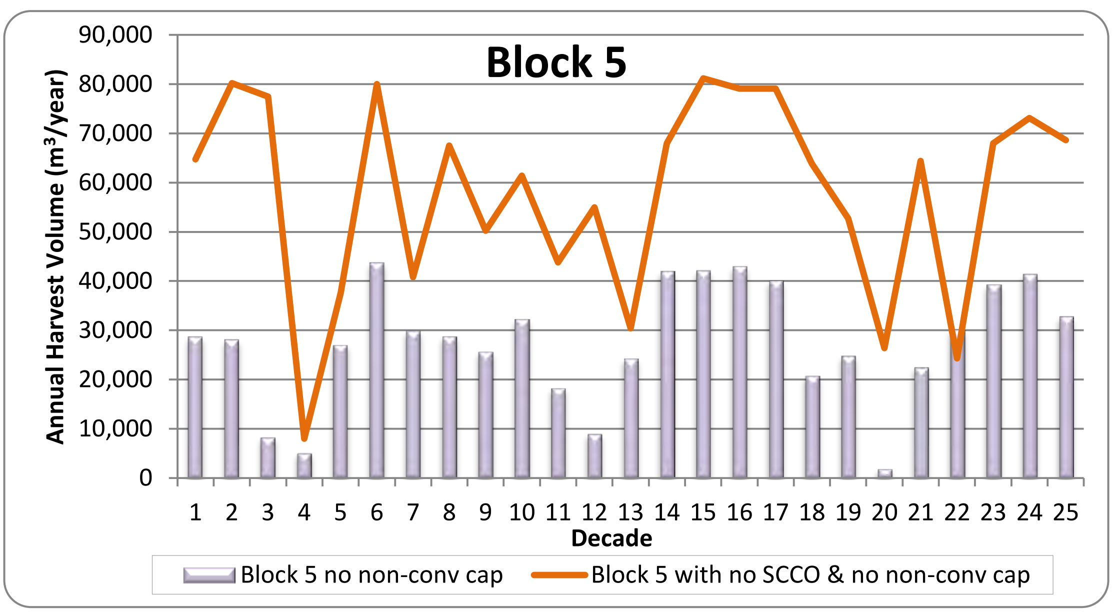

Figure 162 – Block 5 Harvest levels with no SCCO order or non-conventional restriction

Addendum 1

Western Forest Products Inc.

Tree Farm Licence 39

Timber Supply Analysis

MANAGEMENT PLAN 9

Addendum #1

August 2014

Mike Davis, *R.P.F*
Planning Forester
Western Forest Products Inc.

At the request of the Forest Analysis and Inventory Branch (FAIB) of the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) and the Nanwakolas Council the recommended AAC was modeled. The recommended AAC includes the contribution from the conventionally operable land base in the Base Case and the contribution from the non-conventionally operable land base in the sensitivity analysis within which harvest from the non-conventional land base was increased (refer to Section 2 and 4.9 of the Timber Supply Analysis (TSA) report respectively).

The model was set up using the same construct as in the sensitivity analysis discussed in section 4.9 of the TSA report except the initial conventional and non-conventional harvest volumes were set to the recommended AAC contributions by supply block. The following figures and table present the harvest schedule and growing stock levels achieved. For comparison purposes the total harvest volume from the Base Case and the sensitivity analysis with increased harvest from the non-conventionally operable land base are indicated in the harvest schedule figures.

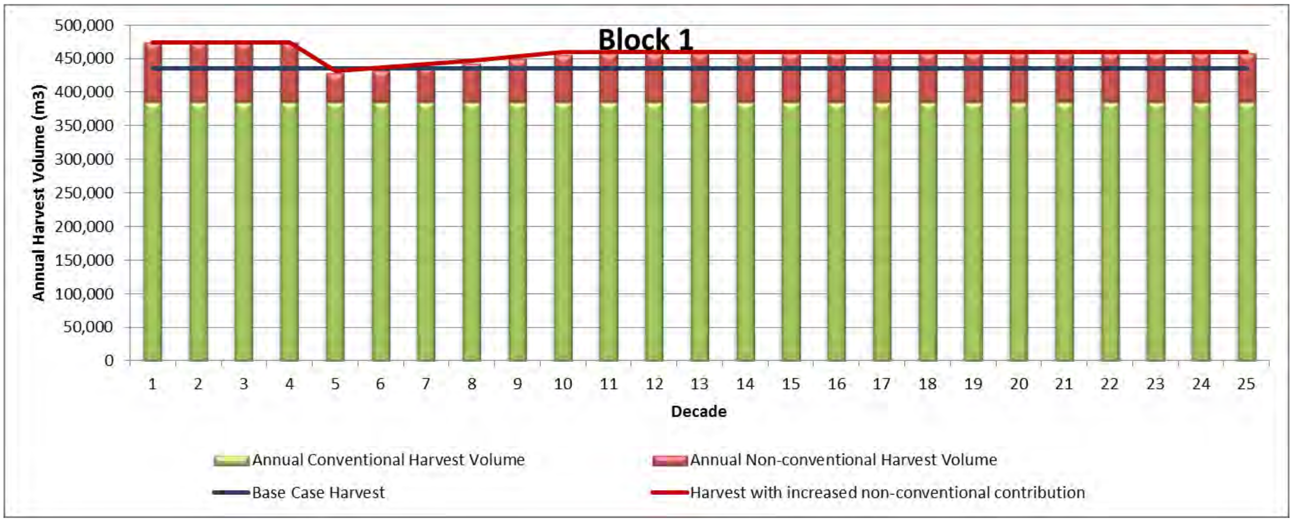

Figure 1 – Block 1 Recommended AAC Harvest levels

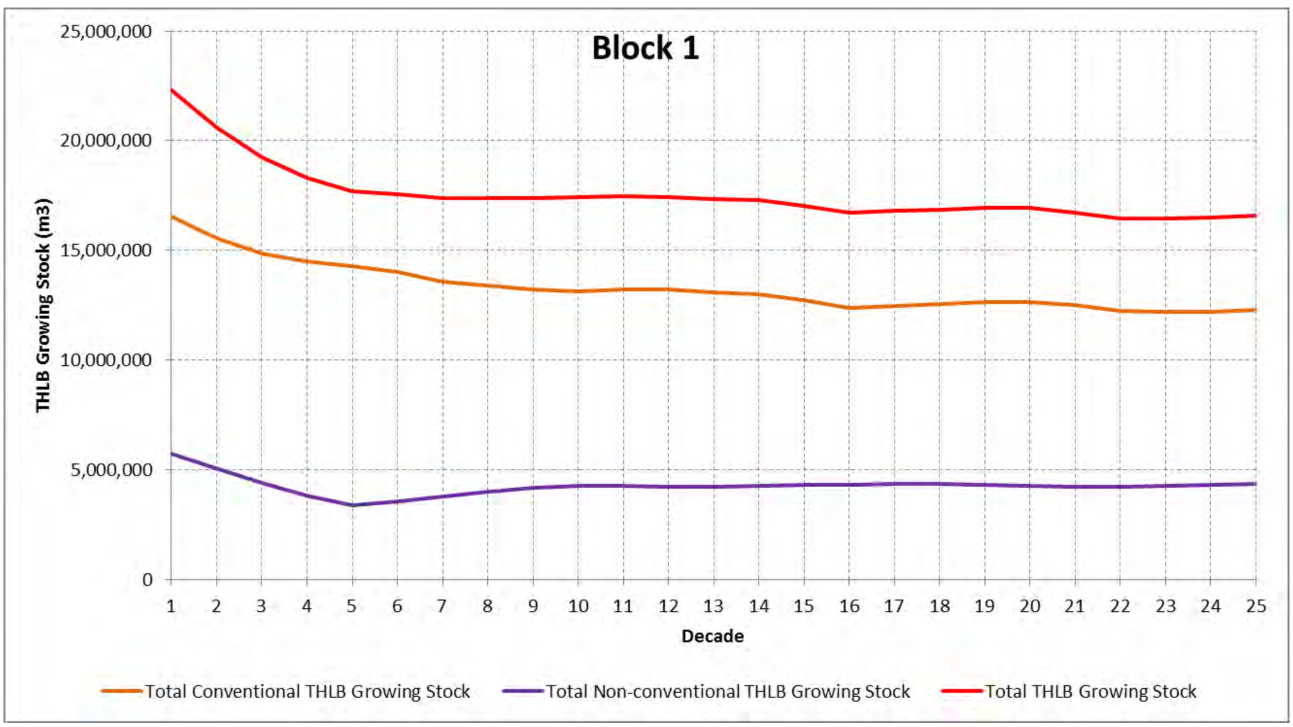

Figure 2 – Block 1 Recommended AAC THLB Growing Stock

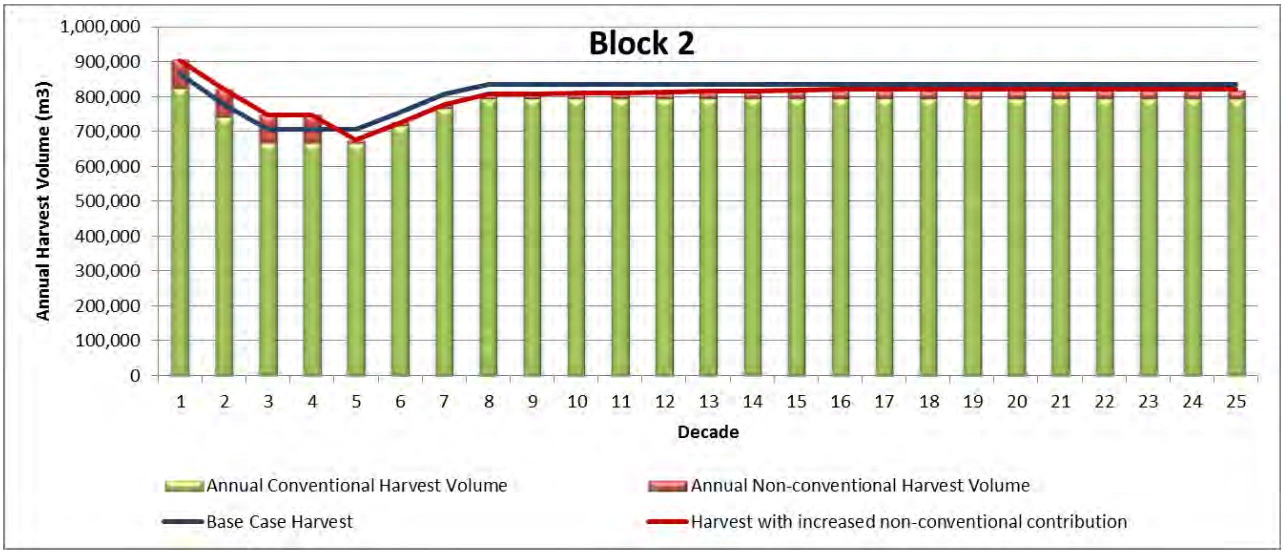

Figure 3 – Block 2 Recommended AAC Harvest levels

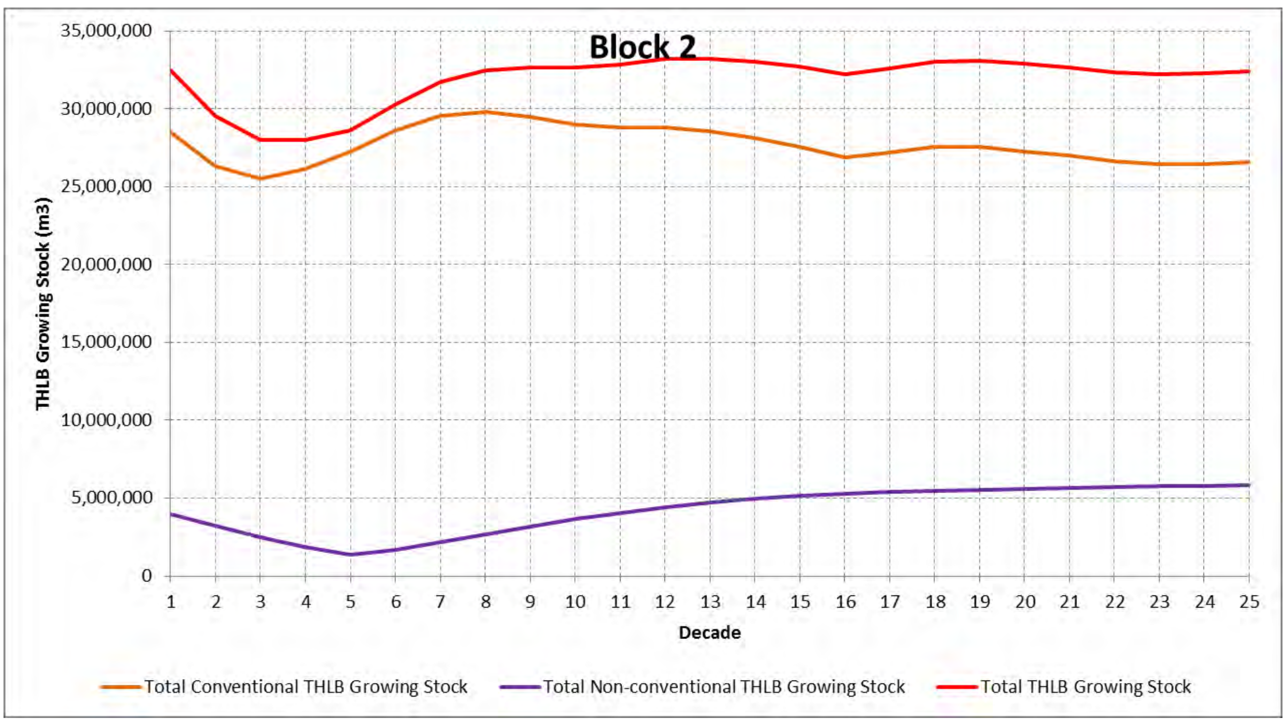

Figure 4 – Block 2 Recommended AAC THLB Growing Stock

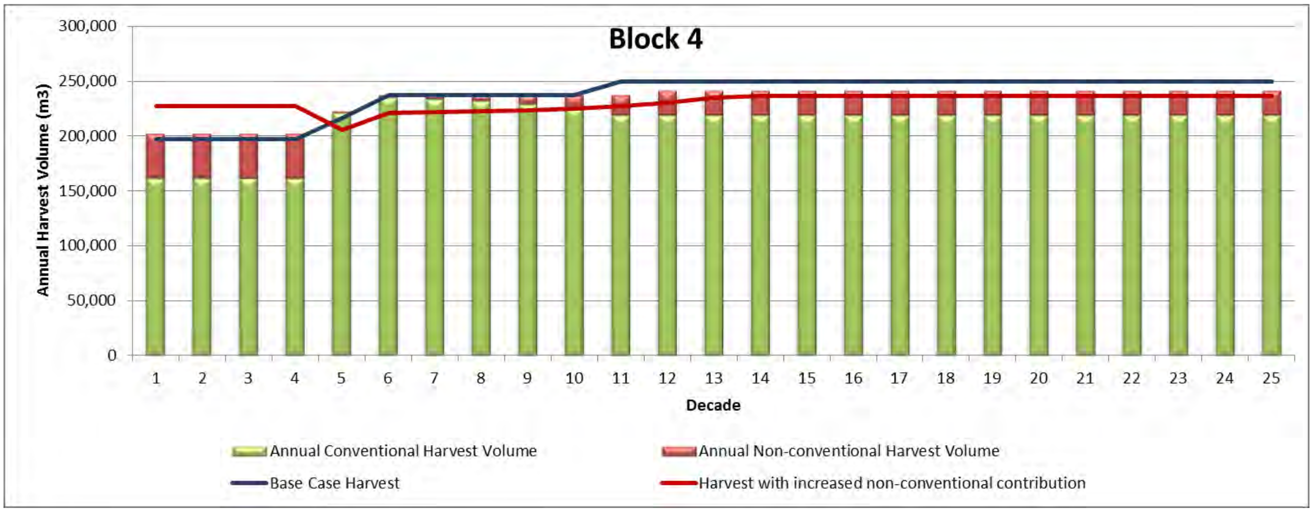

Figure 5 – Block 4 Recommended AAC Harvest levels

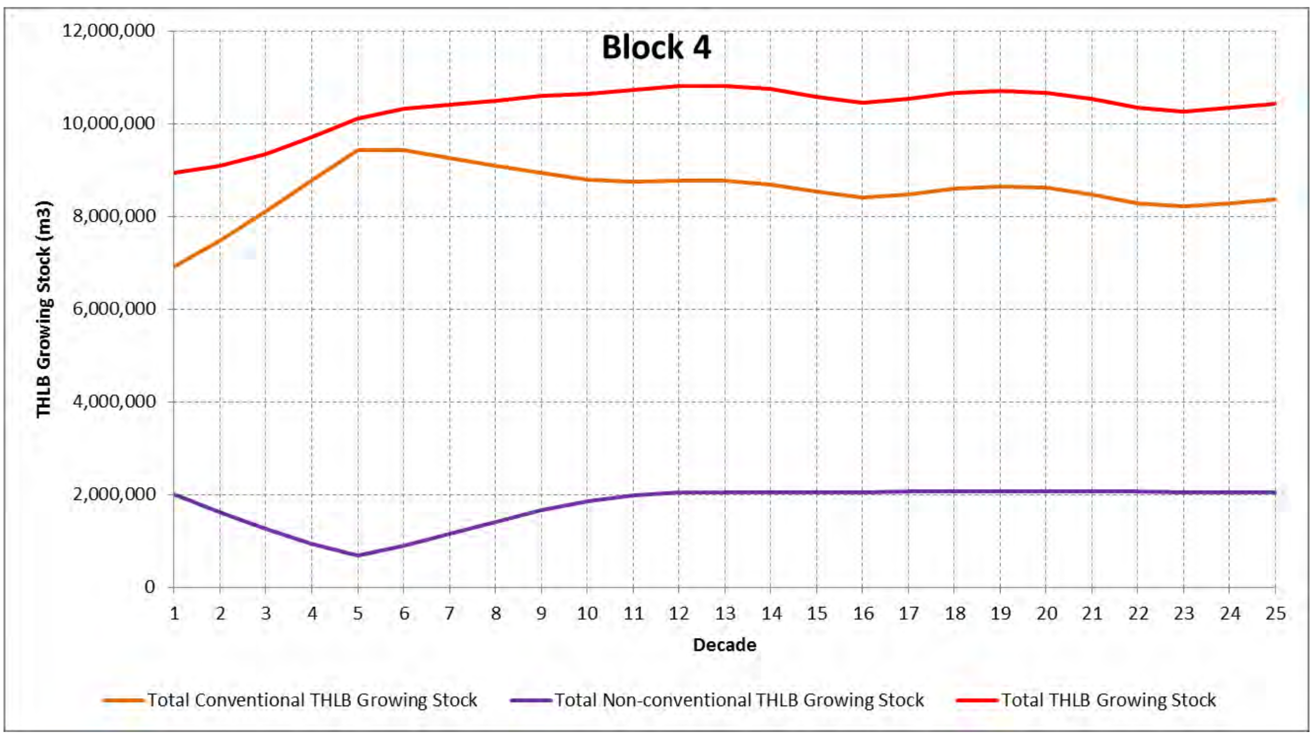

Figure 6 – Block 4 Recommended AAC THLB Growing Stock

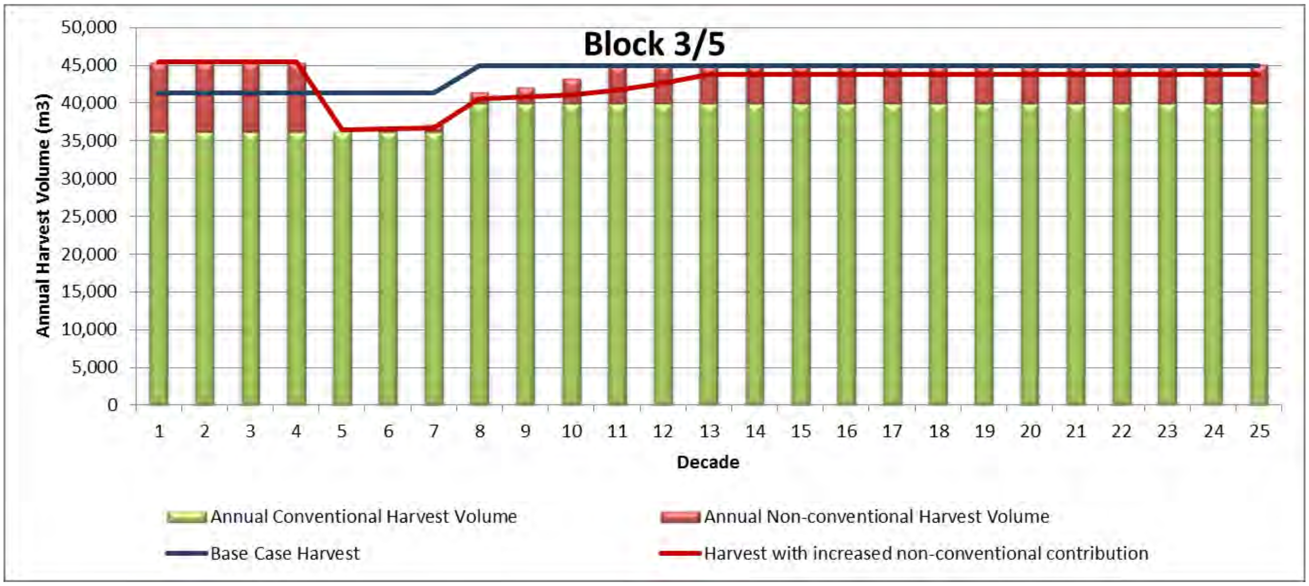

Figure 7 – Blocks 3&5 Recommended AAC Harvest levels

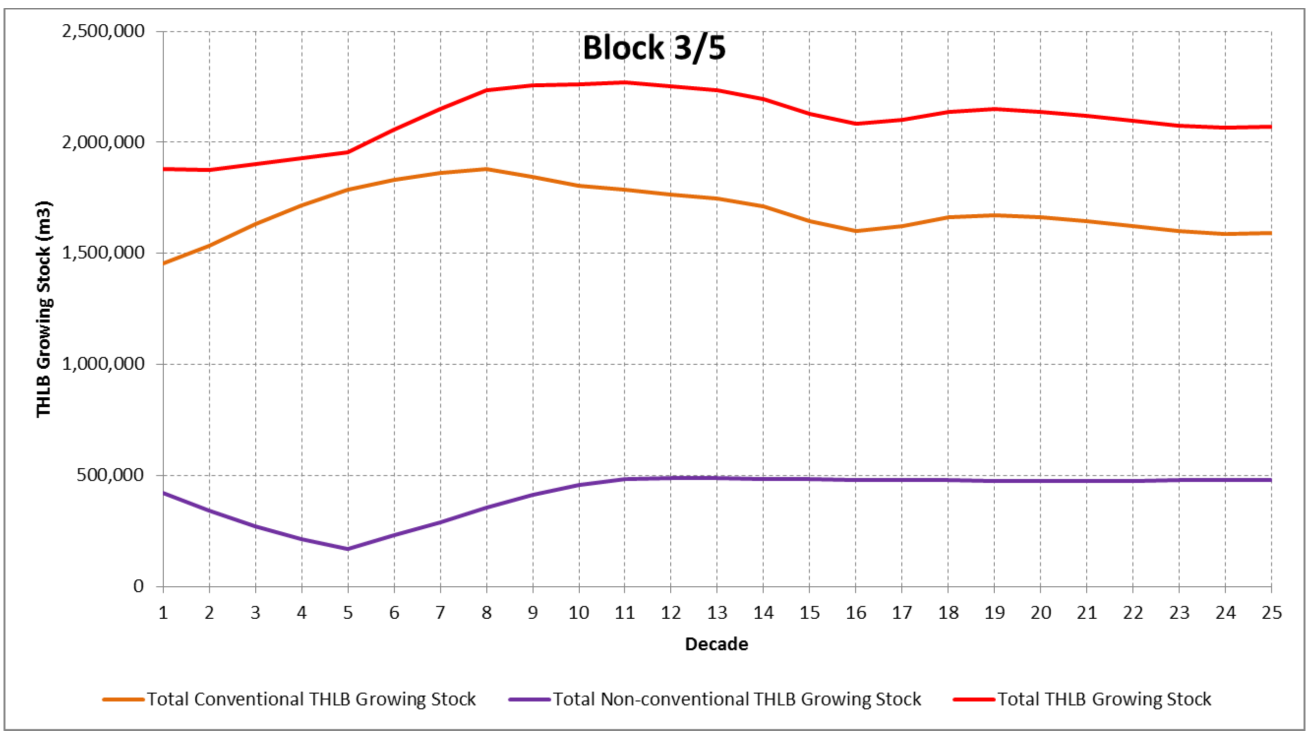

Figure 8 – Blocks 3&5 Recommended AAC THLB Growing Stock

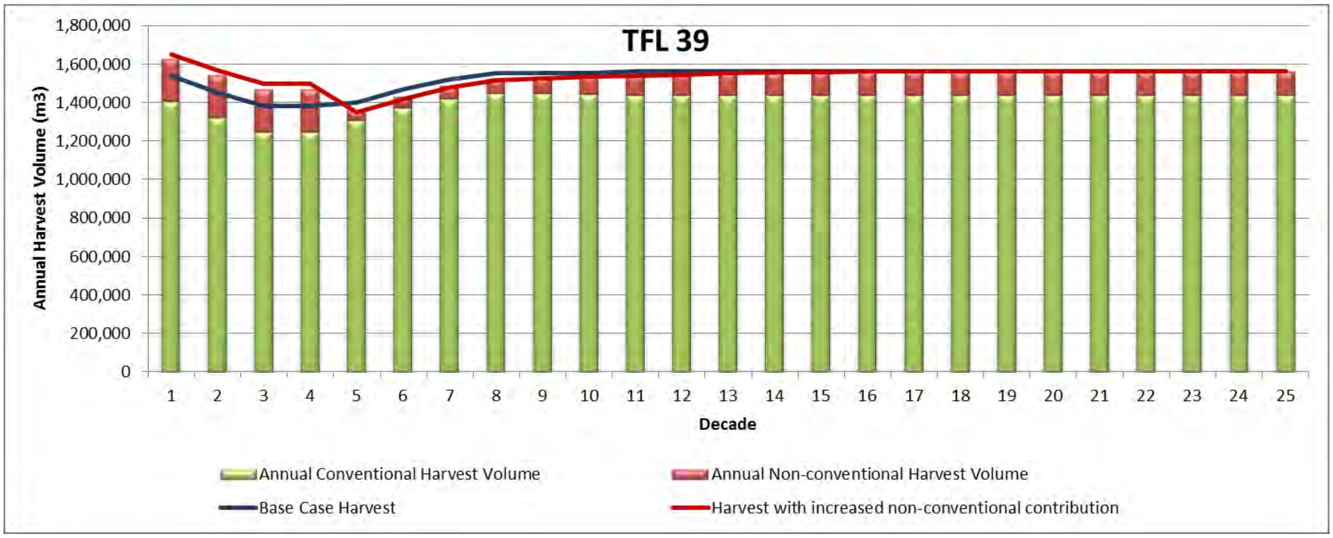

Figure 9 – TFL 39 Recommended AAC Harvest levels

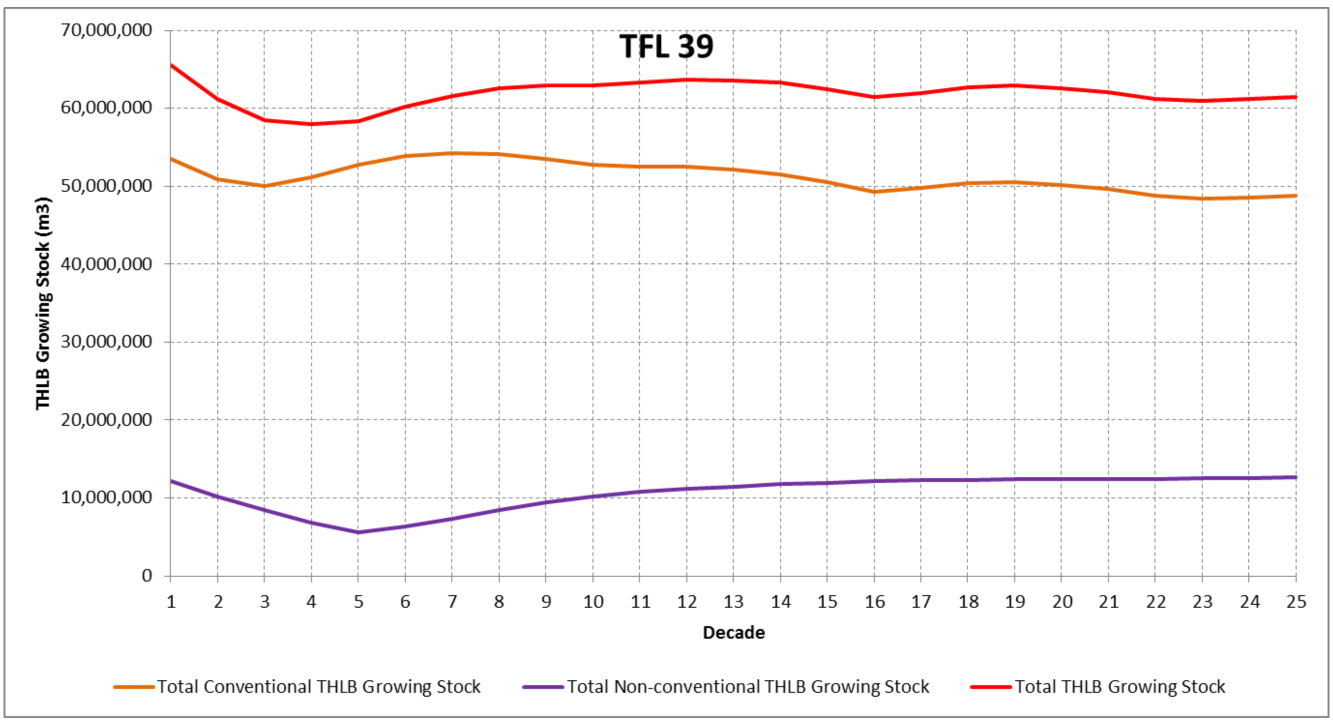

Figure 10 – TFL 39 Recommended AAC THLB Growing Stock

Table 1 – Recommended AAC Harvest Level Contributions by Supply Block and Operability Classification

Period (Decade #)	Start Year	End Year	Block 1			Block 2			Block 4			Block 3/5			TFL 39		
			Conventional	Non-conventional	Total	Conventional	Non-conventional	Total	Conventional	Non-conventional	Total	Conventional	Non-conventional	Total	Conventional	Non-conventional	Total
1	2012	2021	385,300	89,200	474,500	824,300	82,800	907,100	161,000	40,800	201,800	36,300	9,100	45,400	1,406,900	221,900	1,628,800
2	2022	2031	385,300	89,200	474,500	741,900	82,800	824,700	161,000	40,800	201,800	36,300	9,100	45,400	1,324,500	221,900	1,546,400
3	2032	2041	385,300	89,200	474,500	667,700	82,800	750,500	161,000	40,800	201,800	36,300	9,100	45,400	1,250,300	221,900	1,472,200
4	2042	2051	385,300	89,200	474,500	667,700	82,800	750,500	161,000	40,800	201,800	36,300	9,100	45,400	1,250,300	221,900	1,472,200
5	2052	2061	385,300	44,000	429,300	667,700	9,500	677,200	220,400	1,600	222,000	36,300	0	36,300	1,309,700	55,200	1,364,800
6	2062	2071	385,300	48,400	433,700	717,700	10,500	728,200	234,200	2,400	236,600	36,300	700	37,000	1,373,500	62,000	1,435,500
7	2072	2081	385,300	53,300	438,600	767,700	11,500	779,200	233,000	3,600	236,600	36,300	1,000	37,300	1,422,300	69,400	1,491,700
8	2082	2091	385,300	58,600	443,900	793,400	12,700	806,000	231,200	5,400	236,600	40,000	1,500	41,500	1,449,900	78,200	1,528,100
9	2092	2101	385,300	64,500	449,800	793,400	13,900	807,300	228,500	8,100	236,600	40,000	2,200	42,200	1,447,200	88,800	1,535,900
10	2102	2111	385,300	70,900	456,200	793,400	15,300	808,700	224,400	12,200	236,600	40,000	3,300	43,300	1,443,100	101,800	1,544,900
11	2112	2121	385,300	73,800	459,100	793,400	16,900	810,200	218,300	18,300	236,600	40,000	5,000	45,000	1,437,000	114,000	1,551,000
12	2122	2131	385,300	73,800	459,100	793,400	18,600	811,900	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	119,800	1,556,800
13	2132	2141	385,300	73,800	459,100	793,400	20,400	813,800	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	121,700	1,558,700
14	2142	2151	385,300	73,800	459,100	793,400	22,500	815,800	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	123,700	1,560,700
15	2152	2161	385,300	73,800	459,100	793,400	24,700	818,100	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	126,000	1,563,000
16	2162	2171	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
17	2172	2181	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
18	2182	2191	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
19	2192	2201	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
20	2202	2211	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
21	2212	2221	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
22	2222	2231	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
23	2232	2241	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
24	2242	2251	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400
25	2252	2261	385,300	73,800	459,100	793,400	27,200	820,500	218,300	22,400	240,700	40,000	5,100	45,100	1,437,000	128,500	1,565,400

As would be expected the resulting harvest schedules are very similar to the schedules discussed in section 4.9 and Appendix B11 of the TSA report. The most significant difference occurs in Block 4. For Block 4 the initial harvest level in this scenario is closer to the Base Case and as such the resulting schedule more closely resembles the Base Case schedule but with a lower long-term harvest due to the increased short-term harvest levels and maintaining marginally higher long-term THLB inventory levels.

Relative to the Base Case across the entire TFL, the recommended AAC allows higher harvest levels in the short term, marginally reduced mid-term harvest and no impact to long-term harvest level.

Addendum 2

Western Forest Products Inc.

Tree Farm Licence 39

Timber Supply Analysis

MANAGEMENT PLAN 9

Addendum #2

July 2015

REGISTERED PROFESSIONAL FORESTER
PROVINCE OF BRITISH COLUMBIA
MICHAEL J. DAVIS
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Mike Davis, *R.P.F*
Planning Forester
Western Forest Products Inc.

1. Background

The Ministry of Forests, Lands and Natural Resource Operations (FLNRO) is proposing to replace the 2007 South Central Coast Order (SCCO) and Central and North Coast Order (CNCO) and all amendments (2009 and 2013) with the proposed "2015 Great Bear Rainforest Order" (GBRO - June 2015). Only the SCCO applies to TFL 39 and only to supply blocks 3 and 5. At the request of Forest Analysis and Inventory Branch (FAIB) of FLNRO the objectives of the proposed GBRO were modeled.

The Management Plan (MP) #9 timber supply analysis (April 2014) includes netdowns and forest cover constraints that address the objectives of the SCCO (including the March 2009 amendments). Details are provided in the accompanying Timber Supply Analysis Information Package (refer to Section 7).

The proposed GBRO will significantly change the objectives for ecological representation (referred to as landscape level biodiversity in the SCCO). Over the past few years ecological inventories (either Terrestrial Ecosystem Mapping (TEM) or Predictive Ecosystem Mapping (PEM)) have been completed for those portions of the Great Bear Rainforest (GBR) for which such inventories were not available in 2007 when the original SCCO and CNCO were established. Having ecological mapping across the entire GBR allows old seral forest targets to be established for site-series groups (SSG) rather than site-series surrogates (SSS) as was done in the SCCO and CNCO. In addition, the intent of the proposed GBRO is to maintain old forest representation of each ecosystem at 70% of the range of natural variation (RONV) across the order area, with a few minor exceptions.

Objective 3 in Part 1 and Schedules 'F', 'G', 'M', 'N' and 'U' of the proposed GBRO relate to ecological representation and establishing short-term (Minimum Old Forest Retention Level - MOFRL) and long-term (Old Forest Representation Target - OFRT) old forest targets across the GBR. The target percentages listed in Schedule 'G' apply to the entire GBR. To assist licensees in implementing the ecological representation objectives, a guidance table (https://www.for.gov.bc.ca/tasb/SLRP/lrmp/nanaimo/EBM/GBR_BMTA/Schedules/GBR_OFTargetsLU_Impl_Guidance_20150609.pdf) was created that provides targets at the Landscape Unit / SSG level that, when combined, achieve the proposed site series group old forest requirements for the entire GBR.

Objective 4 in Part 1 of the proposed GBRO will establish timelines and requirements for preparing "Landscape Reserve Design" (LRD) that address the old forest targets and simultaneously contribute to the protection and stewardship of Aboriginal Heritage Features, Aboriginal Forest Resources, Cultural Cedar Use, Red and Blue-listed plant communities, and habitat important for species at risk and other specified wildlife species. To test the process for creating a Landscape Reserve Design, Western Forest Products (WFP) staff undertook a review of TFL 39 Block 3, a portion of the Broughton Landscape Unit.

The other objectives in the SCCO have been incorporated into the proposed GBRO with little or no effective change; therefore, no other changes were made to the model set-up.

2. Analysis Approach

Three analyses were undertaken to test the impact of the proposed GBRO:

1. Aspatially apply the old forest target percentages by landscape unit listed in the guidance table with the Base Case model set-up (maximum 5,000 m^3/year non-conventional harvest);
2. Aspatially apply the old forest target percentages by landscape unit listed in the guidance table with the increased non-conventional harvest model set-up that formed the basis for WFP's AAC recommendation (even-flow non-conventional old forest harvest level for first 40 years and mature and younger forest only thereafter); and,
3. Apply the draft Landscape Reserve Design for Block 3, aspatially apply the old forest target percentages for Block 5 (Phillips landscape unit) listed in the guidance table with the increased non-conventional harvest model set-up that formed the basis for WFP's AAC recommendation.

Table 1 lists the productive forest hectares by site-series group and the corresponding target percentages for OFRT (Column A) and MOFRL (Column B) for Block 3 (Broughton) and Block 5 (Phillips). The resulting MOFRL target hectares were set as minimum constraints within the model from the beginning of the analysis period (2012-2261). Where there is currently insufficient old forest to meet the minimum MOFRL the model "recruits" old forest to meet the target as quickly as possible.

The OFRT target hectares were set as minimum constraints within the model to be met by the start of the final decade in the model (i.e. 2252). This ensures the targets are achieved by 2264 as listed in Objective 3 of the proposed GBRO.

Table 1 – Ecological Representation Targets

SSG	Phillips Productive Ha	Phillips Target % Column A	Phillips Target % Column B	Phillips Target Ha Column A	Phillips Target Ha Column B	Broughton Productive Ha	Broughton Target % Column A	Broughton Target % Column B	Broughton Target Ha Column A	Broughton Target Ha Column B
CWHvm1	**7,611.9**			*3,799*	*1,915*	**4,117.3**			*2,126*	*871*
00	147.5	93%	47%	137	69	6.6	63%	0%	4	0
02	28.3	78%	63%	22	18	25.8	73%	12%	19	3
03	1,554.2	59%	46%	917	715	2,239.0	48%	21%	1,075	470
04	837.2	30%	7%	251	59		N/A	N/A	N/A	N/A
09	205.7	94%	78%	193	160		N/A	N/A	N/A	N/A
14	9.7	95%	73%	9	7	41.8	63%	22%	26	9
01_06	2,476.1	42%	19%	1,040	470	1,729.6	55%	21%	951	363
05_07_08	2,237.5	50%	17%	1,119	380	23.5	73%	18%	17	4
10_11	113.5	95%	30%	108	34		N/A	N/A	N/A	N/A
12_13	2.2	98%	98%	2	2	51.0	66%	41%	34	21
CWHvm2	**4,779.4**			*2,468*	*2,092*					
00	100.7	83%	38%	84	38		N/A	N/A	N/A	N/A
02	1.5	0%	0%	0	0		N/A	N/A	N/A	N/A
03	2,288.1	61%	57%	1,396	1,304		N/A	N/A	N/A	N/A
04	222.7	30%	14%	67	31		N/A	N/A	N/A	N/A
11	19.5	62%	58%	12	11		N/A	N/A	N/A	N/A
01_06	1,571.4	42%	34%	660	534		N/A	N/A	N/A	N/A
05_07_08	554.1	42%	28%	233	155		N/A	N/A	N/A	N/A
09_10	21.5	81%	81%	17	17		N/A	N/A	N/A	N/A
MHmm1	**1,876.1**			*1,223*	*1,114*					
00	56.4	94%	91%	53	51		N/A	N/A	N/A	N/A
02	1,179.8	74%	66%	873	779		N/A	N/A	N/A	N/A
01_04	633.7	46%	44%	292	279		N/A	N/A	N/A	N/A
03_05	5.2	90%	90%	5	5		N/A	N/A	N/A	N/A
06_07	1.0	93%	93%	1	1		N/A	N/A	N/A	N/A
Total	**14,267.4**			*7,490*	*5,121*	**4,117.3**			*2,126*	*871*

3. Results

A. Timber Harvesting Land Base

The Base Case and AAC recommendation model set-up included Strategic Level Reserve Design (SLRD) for both Blocks 3 and 5 that addressed the SCCO objectives. As discussed earlier, these scenarios test the timber supply impact of the proposed GBRO utilizing combinations of spatially defined LRD for Block 3 and aspatial SSG targets. The effect on timber harvesting land base (THLB) is indicated in Table 2. The LRD for Block 3 reduces the THLB by 713 hectares.

Table 2 – Blocks 3 and 5 Timber Harvesting Landbase

Scenario	Block 3 THLB (Ha)	Block 5 THLB (Ha)	Total THLB (Ha)
Base Case / AAC Recommendation	2,336	3,313	5,649
Aspatial SSG in both Blocks	2,866	6,708	9,574
Block 3 LRD, Block 5 aspatial SSG	2,153	6,708	8,861

B. Aspatial Site Series Group Targets for Blocks 3 and 5 with Restricted Non-conventional Harvest Contribution

Applying aspatial constraints to meet the old forest targets within the guidance table provided for the proposed GBRO while limiting non-conventional harvest to 5,000 m^3/year (as per the Base Case) results in a short-term harvest level of 54,200 m^3/year, a 31% increase from the Base Case and 19% increase from the AAC recommended in April 2014 (refer to Table 3 and Figure 1). Long-term harvest increases by 11,500 m^3/year (roughly 25%). The increase in harvest level is due to the larger effective THLB used in this scenario.

Figure 2 indicates the THLB growing stock through time resulting from this harvest schedule. The THLB growing stock reported is significantly greater (2 – 2.5 times) than reported for the Base Case due to the elimination of the SLRD netdown (i.e. area designated as SLRD in the Base Case with no other applicable netdown is considered THLB in this scenario). The model manages old forest to meet the targets by not harvesting THLB. In this scenario, the initial forest has 3,044 ha of old forest THLB of which 1,368 ha remains at the end of the 250 year analysis period.

Table 3 - Harvest Levels with Aspatial SSG Targets and Restricted Non-conventional Contribution

Period (Decade #)	Start Year	End Year	Blocks 3&5 Annual Harvest Volume (m^3)				
					Aspatial SSG Targets with restricted Non-conventional Harvest		
			Base Case	Recommended AAC	Conventional Harvest	Non-conventional Harvest	Total Harvest
1 - 4	2012	2051	41,300	45,400	49,200	5,000	54,200
5	2052	2061	41,300	36,300	49,200	5,000	54,200
6	2062	2071	41,300	37,000	49,200	5,000	54,200
7	2072	2081	41,300	37,300	49,200	5,000	54,200
8	2082	2091	45,000	41,500	51,500	5,000	56,500
9	2092	2101	45,000	42,200	51,500	5,000	56,500
10	2102	2111	45,000	43,300	51,500	5,000	56,500
11	2112	2121	45,000	45,000	51,500	5,000	56,500
12 - 25	2122	2261	45,000	45,100	51,500	5,000	56,500

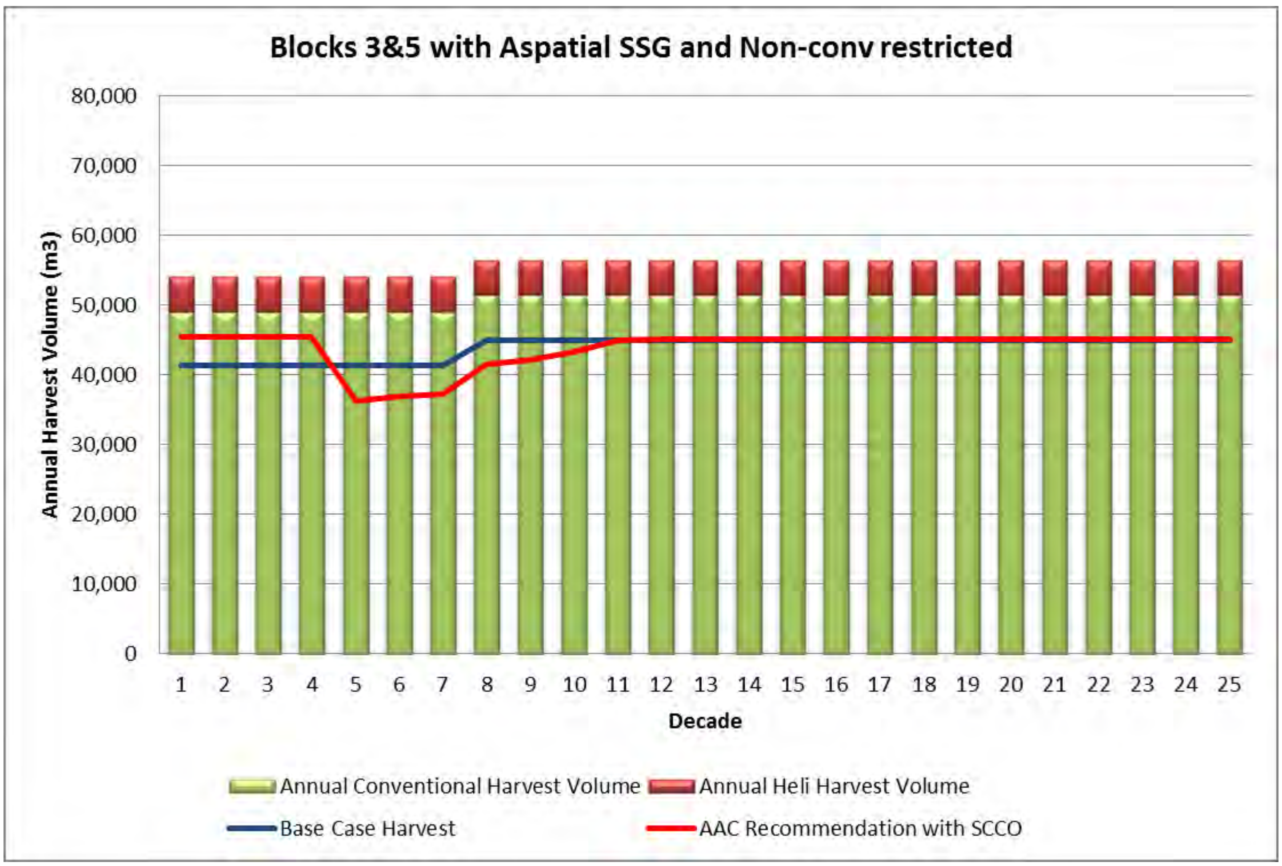

Figure 1 – Harvest Level with Aspatial SSG Targets and Restricted Non-conventional Contribution

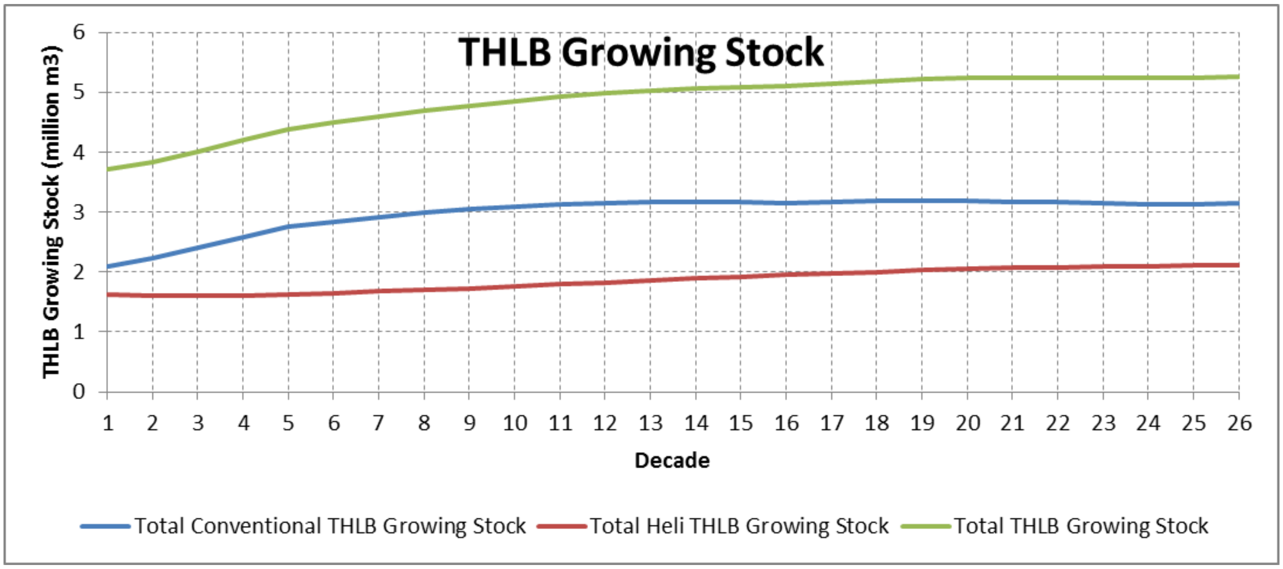

Figure 2 – THLB Growing Stock with Aspatial SSG Targets and Restricted Non-conventional Contribution

C. Aspatial Site Series Group Targets for Blocks 3 and 5 with Increased Non-conventional Harvest Contribution

Relative to the Base Case, the April 2014 AAC recommendation was based on an increased contribution from the non-conventional THLB. To investigate potential harvest levels this scenario was run using the aspatial SSG targets and requiring an even-flow of non-conventional old growth volume over the first 40 years after which only immature non-conventional timber was available. Table 4 and Figure 3 indicate the resulting harvest schedule. Initial harvest can be 37,200 m^3/year greater (90%) than the Base Case or 33,100 m^3/year greater (73%) than the April 2014 AAC recommendation. Relative to the recommended AAC, the additional volume is due to a 9,700 m^3/year increase in conventional harvest and a 23,400 m^3/year increase in non-conventional harvest (refer to Table 1 in Addendum #1 for a breakdown of the split in the recommended AAC harvest schedule). Long-term harvest is increased by 16,200 m^3/year, or 36%.

The increased short-term old forest harvest creates a decline in the total THLB growing stock over the first 50 years after which the reduction in harvest combined with vigorously growing immature stands results in an increase in growing stock such that the THLB inventory levels are nearly identical to those in the scenario described in section B above (refer to Figure 4). In this scenario, the initial forest has 3,044 ha of old forest THLB of which 539 ha remains at the end of the 250 year analysis period in order to meet the old forest retention targets.

Table 4 - Harvest Levels with Aspatial SSG Targets and Increased Non-conventional Contribution

Period (Decade #)	Start Year	End Year	Blocks 3&5 Annual Harvest Volume (m^3)				
			Base Case	Recommended AAC	Aspatial SSG Targets with increased Non-conventional Harvest		
					Conventional Harvest	Non-conventional Harvest	Total Harvest
1 - 4	2012	2051	41,300	45,400	46,000	32,500	78,500
5	2052	2061	41,300	36,300	46,000	0	46,000
6	2062	2071	41,300	37,000	46,000	300	46,300
7	2072	2081	41,300	37,300	46,000	500	46,500
8	2082	2091	45,000	41,500	51,000	700	51,700
9	2092	2101	45,000	42,200	51,700	1,000	52,700
10	2102	2111	45,000	43,300	51,700	1,500	53,200
11	2112	2121	45,000	45,000	51,700	2,300	54,000
12	2122	2131	45,000	45,100	51,700	3,500	55,200
13	2132	2141	45,000	45,100	51,700	5,200	56,900
14	2142	2151	45,000	45,100	51,700	7,800	59,500
15 - 25	2152	2261	45,000	45,100	51,700	9,500	61,200

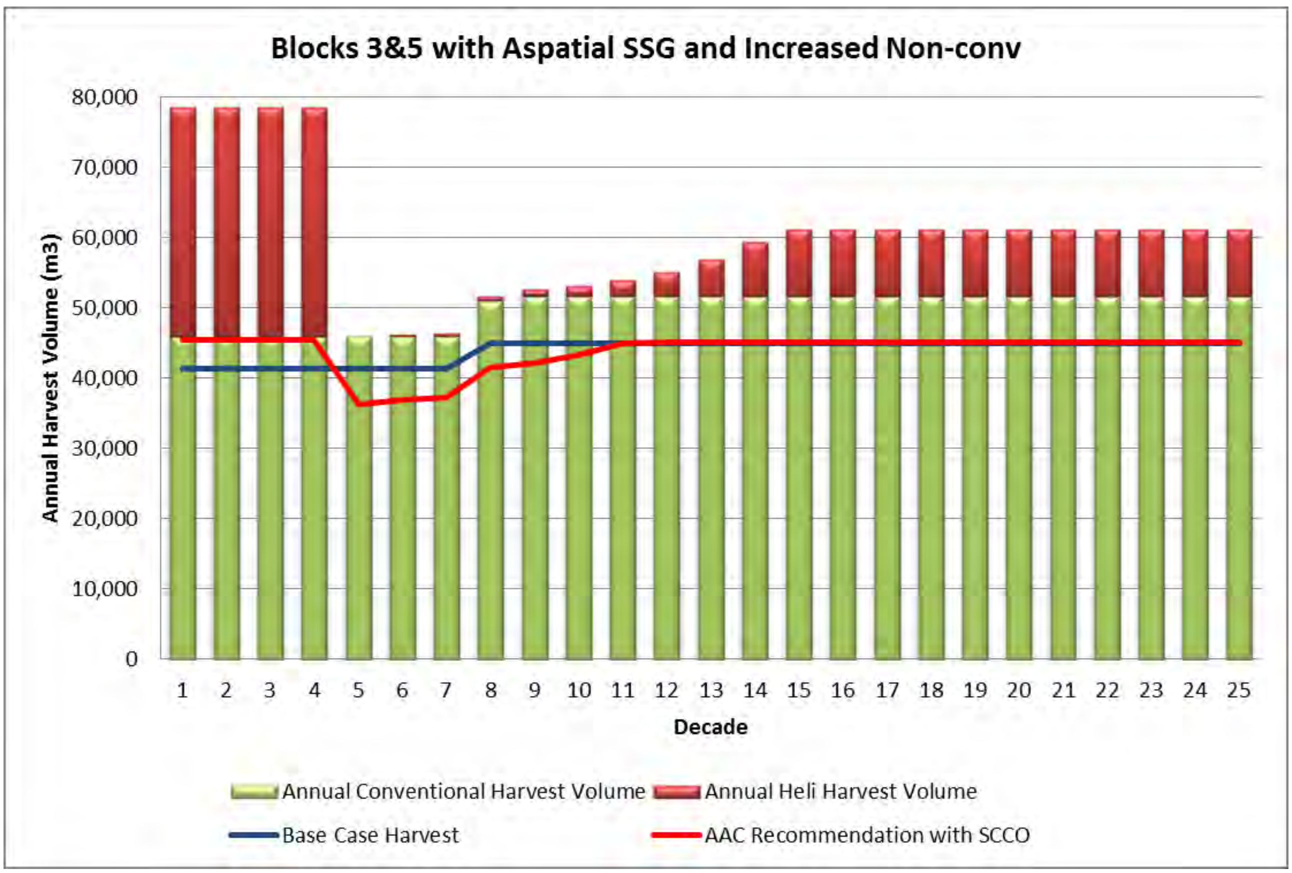

Figure 3 – Harvest Level with Aspatial SSG Targets and Increased Non-conventional Contribution

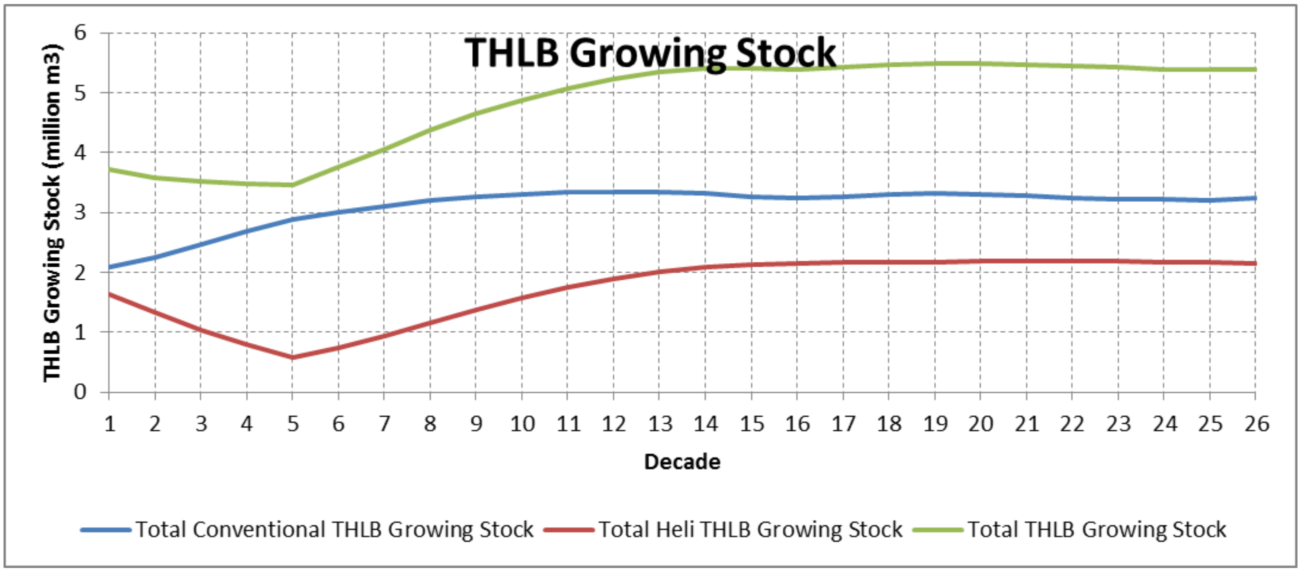

Figure 4 – THLB Growing Stock with Aspatial SSG Targets and Increased Non-conventional Contribution

D. Landscape Reserve Design for Block 3, Aspatial Site Series Group Targets for Block 5 with Increased Non-conventional Harvest Contribution

To test the process for creating a Landscape Reserve Design (Objective 4 in Part 1 of the proposed GBRO), WFP staff undertook a review of TFL 39 Block 3, a portion of the Broughton Landscape Unit. The draft LRD was incorporated into the timber supply analysis data and designated as a 100% netdown. The resulting THLB for Block 3 is 713 ha smaller than when aspatial SSG targets are applied and is 183 ha smaller than the THLB used in the Base Case and April 2014 AAC recommendation.

Compared to meeting the SSG targets aspatially, the LRD-reduced THLB within Block 3 results in a 2,300 m^3/year lower initial conventional harvest contribution (there is no non-conventional THLB within Block 3). The model is able to offset this reduction with an increase in short-term non-conventional harvesting of 3,700 m^3/year such that the initial harvest level when using the draft LRD for Block 3 is 1,400 m^3/year higher (1.8%) than when not. Long-term, conventional harvest is reduced by an insignificant 200 m^3/year (0.4%) and non-conventional harvest is increased by 1,000 m3/year (10.5%). This increase in long-term non-conventional harvest is a result of more old forest being harvested in the short-term and thus increasing the amount of regenerated forest harvestable in the long-term. See Table 5 and Figure 5 for further details.

Table 5 - Harvest Level with Block 3 LRD, Block 5 Aspatial SSG Targets and Increased Non-conventional Contribution

Period (Decade #)	Start Year	End Year	Blocks 3&5 Annual Harvest Volume (m^3)				
			Base Case	Recommended AAC	Block 3 LRD, Block 5 Aspatial SSG, increased Non-conventional Harvest		
					Conventional Harvest	Non-conventional Harvest	Total Harvest
1 - 4	2012	2051	41,300	45,400	43,700	36,200	79,900
5	2052	2061	41,300	36,300	43,700	0	43,700
6	2062	2071	41,300	37,000	43,700	300	44,000
7	2072	2081	41,300	37,300	43,700	500	44,200
8	2082	2091	45,000	41,500	48,700	800	49,500
9	2092	2101	45,000	42,200	51,500	1,200	52,700
10	2102	2111	45,000	43,300	51,500	1,700	53,200
11	2112	2121	45,000	45,000	51,500	2,600	54,100
12	2122	2131	45,000	45,100	51,500	3,900	55,400
13	2132	2141	45,000	45,100	51,500	5,800	57,300
14	2142	2151	45,000	45,100	51,500	8,700	60,200
15 - 25	2152	2261	45,000	45,100	51,500	10,500	62,000

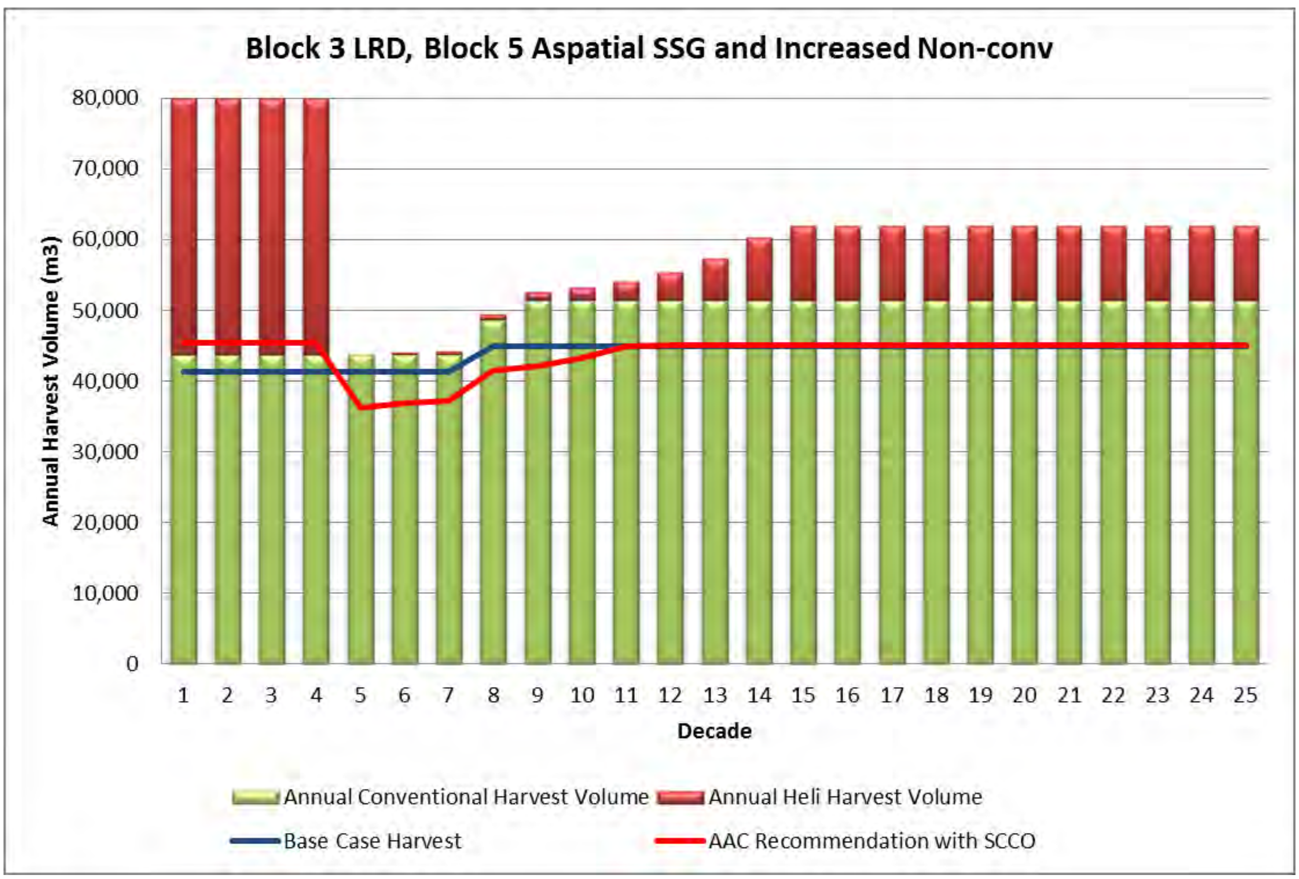

Figure 5 – Harvest Level with Block 3 LRD, Block 5 Aspatial SSG Targets and Increased Non-conventional Contribution

The LRD for Block 3 reduces the initial conventional, and therefore total, THLB growing stock by roughly 425,000 m3 (11.4% - refer to Figure 6); however, as discussed in section B not all THLB is available for harvest as the SSG targets require THLB to be reserved. In this scenario, the initial forest has 2,841 ha of old forest THLB of which 230 ha remains at the end of the 250 year analysis period in order to meet the old forest retention targets within Block 5.

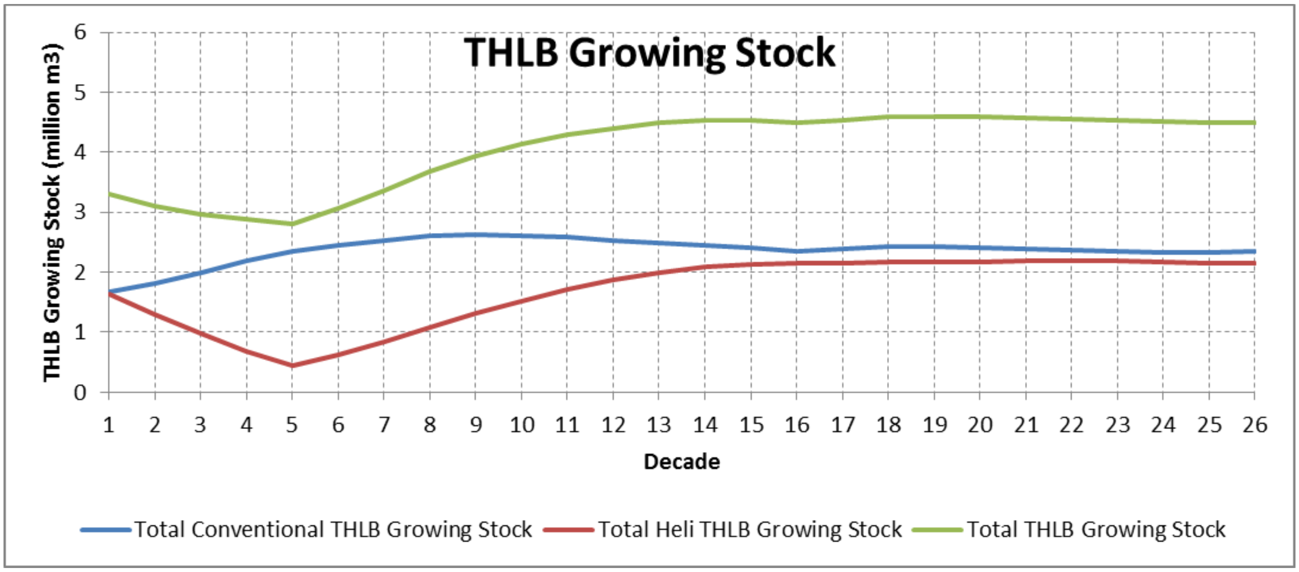

Figure 6 – THLB Growing Stock with Block 3 LRD, Block 5 Aspatial SSG Targets and Increased Non-conventional Contribution

4. Summary and Conclusions

The proposed Great Bear Rainforest Order (GBRO) will revise the objectives for ecological representation within the area currently subject to the South Central Coast Order (and the Central and North Coast Order), including Blocks 3 and 5 of TFL 39. The most significant modifications to management within TFL 39 would be a reduction in long-term old forest reserve requirements in Block 5 (relative to the SCCO 70% Range of Natural Variation (RONV) requirements) that recognizes the harvest history within the Phillips watershed. The old forest retention targets for Block 3 (a portion of the Broughton landscape unit) would increase from the 30% RONV targets in the SCCO.

Timber supply analyses were conducted both with aspatial old forest targets (as detailed in a guidance table provided with the draft GBRO) and draft Landscape Reserve Design (spatially defined reserves designed to meet all landscape-level objectives within the proposed GBRO) for Block 3. The analyses were modeled with non-conventional harvest constraints as per the Base Case analysis and with increased contribution that formed the basis for WFP's recommended AAC in April 2014.

Allowing the timber supply model to meet the old forest retention targets aspatially and limiting non-conventional harvest to 5,000 m^3/year, as in the Base Case, results in an initial harvest level of 54,200 m^3/year, an increase of 12,900 m^3/year (31%) from the Base Case initial harvest level. Changing the non-conventional constraint to even-flow of old forest harvest for the first 40 years and only immature forest thereafter (as per the April 2014 AAC recommendation) while meeting the old forest retention targets aspatially results in an initial harvest level of 78,500 m^3/year, 33,100 m^3/year (73%) greater than the April 2014 AAC recommendation.

Objective 4 of Part 1 of the proposed GBRO requires that for each Landscape Unit in the order area, a Landscape Reserve Design (LRD) must, in time, be prepared that addresses the old forest retention targets and to the extent reasonably practicable address the protection and stewardship of Aboriginal Heritage Features, Aboriginal Forest Resources, Cultural Cedar Use, Red and Blue-listed Plant Communities and habitat important for wildlife. WFP staff has created a draft Landscape Reserve Design for TFL 39 Block 3, a portion of the Broughton landscape unit. A scenario was run that used this draft LRD for Block 3, aspatial old forest targets for Block 5 and the even-flow of old non-conventional forest described above. This scenario resulted in an initial harvest level of 79,900 m^3/year, an increase of 34,500 m^3/year (76%) from the April 2014 AAC recommendation.

In conclusion, the proposed Great Bear Rainforest Order will increase timber supply within TFL 39 Blocks 3 and 5 when compared to the requirements of the South Central Coast Order that were modeled in the April 2014 timber supply analysis. This is mainly due to a reduction in old forest retention requirements within Block 5 (Phillips landscape unit). Under the GBRO, the AAC contribution from Blocks 3 and 5 is roughly 79,000 m^3/year, compared to 45,000 m3/year in April 2014 AAC recommendation.

Block 4 was deleted from TFL 39 and added to TFL 6 on January 1, 2015. As such the recommended AAC for TFL 39 is now 1,427,000 m^3/year, a reduction of 202,000 m^3/year attributed to the former Block 4. With this adjustment, the proposed GBRO increases the recommended AAC for TFL 39 from 1,427,000 m^3/year to 1,461,000 m^3/year, an increase of 34,000 m^3/year or 2.4%.