Yield Table Summary Report:
Canfor TFL 30 – Prince George
(MSYTs and NSYTs)
Version 2

Prepared for

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1. INTRODUCTION

1.1 TERMS OF REFERENCE

Yield tables presented in this report were prepared for Bill Wade, *RPF*, of Canadian Forest Products (Canfor), for Tree Farm Licence (TFL) 30. These yield tables will be used in Management Plan 9 (MP 9) for the TFL 30 timber supply analysis, to be completed by the McGregor Resource Analysis Group (MRAG) (contact: Steve Voros). The tables were generated by Guillaume Thérien, *PhD* of J.S. Thrower and Associates Ltd (JST). In this second version of the final report, the inventory database was adjusted using the Fraser method, as recommended by the Ministry of Forests (MOF).

1.2 OBJECTIVES

The objectives of this report are to:

1) Document the inputs to these yield tables.
2) Summarize the output of the yield tables.
3) Provide information for Canfor to review, to ensure that the yield tables reflect their management objectives for MP 9.

1.3 PROJECT OVERVIEW

This report describes the inputs and assumptions that were used to generate the Managed Stands Yield Tables (MSYTs) and Natural Stands Yield Tables (NSYTs) to be used in the TFL 30 timber supply analysis for MP 9. *Batch VDYP (version 6.6d)* and *Batch TIPSY (version 2.5r)* were used to produce NSYTs and MSYTs respectively. Yield tables in this report encompass additional available information such as:

1) Inventory information from the recently completed Vegetation Resources Inventory (VRI).
2) Improved site index estimates from the Site Index Adjustment (SIA) project, the Terrestrial Ecosystem Map (TEM), and the Terrestrial Resource Information Map (TRIM).[1]
3) Improved Operational Adjustment Factor (OAF) 1 estimates using TEM information.
4) Spruce weevil effects (resulting in yield reductions).
5) Silviculture regimes (developed by Canfor to mitigate spruce weevil effects) and the effects of planting improved stock on future post-harvest regenerated (PHR) stands.

1.4 STAKEHOLDERS

The stakeholders involved in the development and coordination of the various components were:

Canfor	Bill Wade was responsible for MP 9. Russ Martin developed inputs for the silviculture regimes. Kerry Deschamps was responsible for the SIA, TEM, and VRI components.
MOF	Albert Nussbaum (Research Branch) approved the yield tables.

[1] J.S. Thrower and Associates Ltd. March 2000. Potential Site Index Adjustment for TFL 30. Contract To Canadian Forest Products Ltd., Prince George, BC. 15 pp. (JST Project No. NWP-041-007).

	Doug Beckett (Prince George [PG] Forest Region) will complete the local timber supply analysis and approve the yield tables. Bob Richards (PG District) approved the spruce weevil ratings for existing PHR stands. Stuart Taylor (PG Region) approved the spruce weevil modeling.
CFS	Rene Alfaro (PFC) reviewed spruce weevil hazard rating.
MRAG	Steve Voros will complete the timber supply analysis for MP 9.
JST	Christie Staudhammer and Guillaume Thérien produced the yield tables and developed the spruce weevil model. Jim Thrower was the project director and coordinator.

1.5 YIELD TABLE INPUTS - OVERVIEW

Three basic types of yield tables were produced for TFL 30:

1) PHR stands
   a) Existing PHR: existing stands in age class one (1–20 years).
   b) Future PHR: stands that will be harvested and regenerated, including NSR areas, but currently do not exist.
2) Natural stands: existing stands greater than 20 years of age.

A current and future yield table was generated for all polygons resulting from an overlay of the new forest cover database, forest development plan, TEM, TRIM, and the spruce weevil hazard map. Tables were generated for both the 12.5 cm+ and 17.5 cm+ utilization level (Table 1).

Table 1. Summary of yield table inputs, data sources, and models.

	Existing Natural Stands	Existing PHR Stands	Future Stands (all PHR)
Inputs			
Modeling Unit	Mapsheet/Polygon	TEM/PSI*	TEM/PSI
Model	Batch VDYP (6.6d)	BatchTIPSY (2.5r)	BatchTIPSY (2.5r)
Age Class	2+	1	All
Area	123,440 ha	36,580 ha (excluding 1,037 ha NP area)	156,844ha (excluding 14,164 ha NP area)
Proportion of PFLB	72%	21%	92%
Stand Description	VRI Phase I	Silviculture Regimes	Silviculture Regimes
Site Index	VRI Phase I (15.5 m avg – all spp)	PSI from SIA (21.3 m average – all spp)	PSI from SIA (20.9 m average - all spp)
OAF1	N/A	7.5% + NP area in subzone (7% on average)	7.5% + NP area in subzone (7% on average)
Spruce weevil Impact	N/A	6.2% vol. reduction	4.9% vol. reduction
Tree Improvement	N/A	N/A	Avg 17.9% volume gain
Outputs			
Average MAI	2.1 m^3/ha/yr	5.1 m^3/ha/yr	5.3 m^3/ha/yr
Average Culm Age	111 yrs	72 yrs	70 yrs

* PSI is the potential site index of a stand.

2. EXISTING NATURAL STANDS

2.1 DEFINITION

Natural stands include all existing stands on the TFL in age class 2 and older. Existing forest cover polygons with adjusted database of inventory attributes (VRI Phase I) were used to produce the NSYTs by mapsheet, polygon number, and subzone. The database included 14,591 polygons ranging from 0 - 566 ha. Most polygons were in the 0 - 10 ha class (Figure 1).

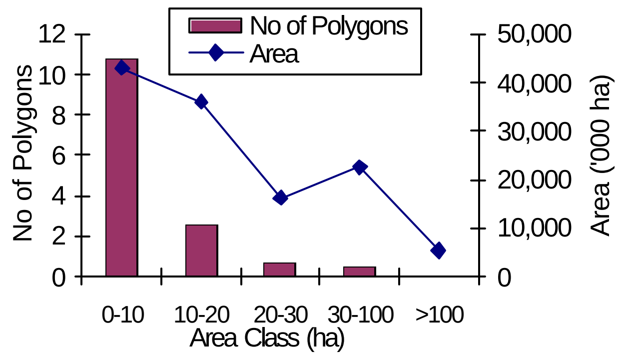

Figure 1. Distribution of polygons for existing natural stands.

2.2 VDYP INPUTS

Stand density information, species composition, and height and age are inputs into VDYP that were taken from the adjusted inventory database information (Appendix II – VRI Adjustment Process). Species composition was dominated by Sx with an average site index of 15.5 m. In the inventory, density information is represented by stocking class and crown closure and both attributes are used as a density measure in VDYP. The average crown closure was 38% and most stands were in stocking class 1 (Figure 2).

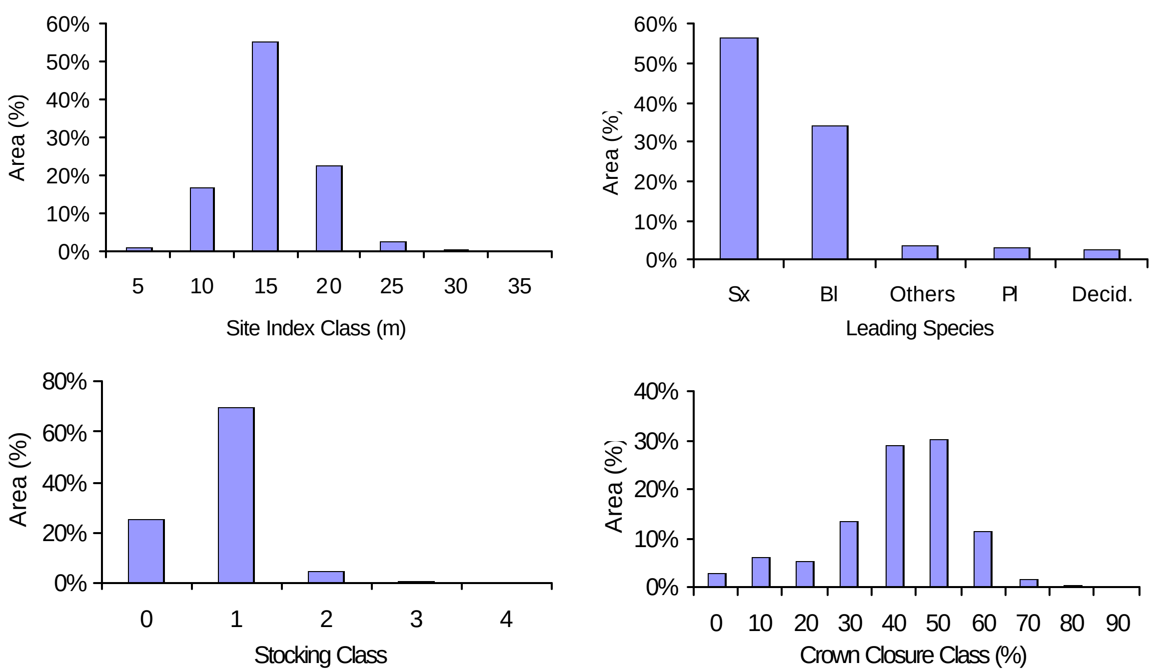

Figure 2. Area distribution for existing natural stands (site index, species, stocking class, and crown closure).

3. EXISTING PHR STANDS

3.1 DEFINITION

Existing PHR stands are those in age class 1 and include stands regenerated after 1980, but exclude not sufficiently regenerated (NSR) stands. The VRI forest cover, TEM, and TRIM were used to define existing PHR stands. Silviculture regimes (Appendix IV – Silviculture Regimes) were used to define stand attributes. TEM polygons provided the ecological information to derive adjusted PSI with TRIM information when applicable. The modeling unit for existing PHR stands was biogeoclimatic (BGC) site series and PSI.

3.2 POTENTIAL SITE INDEX

The SIA project resulted in a ratio adjustment for the PSI of most polygons below 1000 m and an elevation adjustment for most polygons above 1000 m. The overall average potential site index (PSI) for all species was 21.5 m (Table 2). Most area of existing PHR stands was in PSI class 22 m (Figure 3).

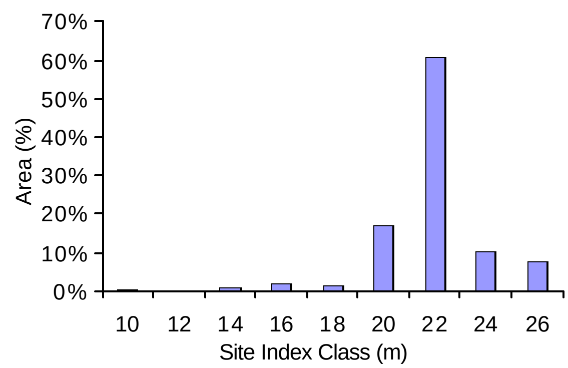

Figure 3. Proportion of area by PSI class for existing PHR stands.

Table 2. PSI statistics (m) for existing PHR stands.

Spp	Area (ha)	Avg	Min	Max	SD
Pl	15,862	22.1	12.0	26.0	2.0
Sx	20,689	20.8	9.0	25.0	1.8
All	*36,580*	*21.3*	*9.0*	*26.0*	*2.0*

3.3 SILVICULTURE REGIMES

Existing silviculture regimes were defined internally by Canfor. They were based on existing silviculture regimes currently being used by Canfor and were designed to mitigate spruce weevil effects. The current silviculture regimes are expected to be similar to future silviculture regimes. Each regime describes species composition, stand density, and treatments for all PHR stands by site series and BGC subzone. The regeneration delay was set at one year, and will be included in the timber supply modeling (not in the yield tables).

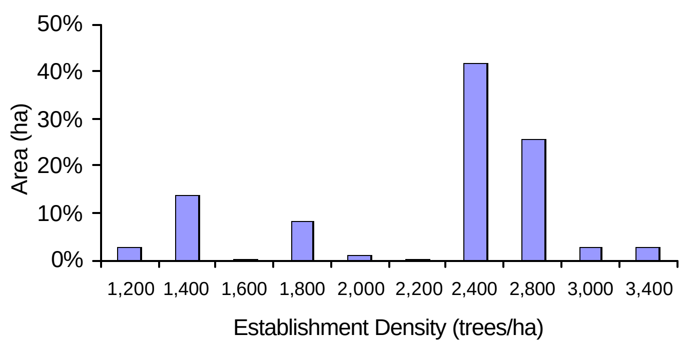

Figure 4. Distribution of stand density at free-growing for existing PHR stands.

3.4 SPECIES COMPOSITION AND DENSITY

Stand densities and species composition for existing PHR stands were based on the silviculture regimes defined for each site series. For modeling purposes, establishment densities were estimated as 10% more than free-growing densities (to account for mortality between establishment and free-growing). Densities range from 1,210 to 3,330 trees/ha (Figure 4) with an average of 2,300 trees/ha. Sx, Pl, and Bl are the main species planted on the TFL (Table 3).

Table 3. Area by species composition for existing PHR stands.

Leading Species and % Comp						
Spp1	%	Spp2	%	Spp3	%	Area(ha)
Sx	80	Pl	15	Bl	5	11,355
Pl	55	Sx	20	Fd	15	8,469
Sx	90	Bl	10		0	5,086
Pl	40	Sx	30	Bl	20	2,316
Sx	100					2,254
Pl	40	Sx	40	Bl	20	1,995
Pl	90	Bl	10		0	1,169
Sx	80	Pl	10	Bl	5	1,076
Pl	60	Sx	30	Bl	10	1,014
Pl	70	Bl	20	Sx	10	650
Sx	70	Bl	30			538
Sx	70	Pl	30			365
Pl	50	Fd	30	Bl	20	129
Pl	100					100
Fd	40	Pl	30	Hw	30	29
Pl	50	Sx	40	Bl	10	18
Sx	60	Bl	40			14
Sx	60	Hw	20	Bl	20	3

3.5 SILVICULTURAL TREATMENTS

Planting genetically improved seedlings on the TFL began in 1998. Therefore, yield increases from improved stock were excluded from existing PHR stand yield tables.

MSYTs for existing PHR stands were not adjusted for commercial thinning or spacing. Stand descriptions are considered to adequately represent the effect of spacing on stand growth and yield.

Fertilization has not been applied to existing PHR stands, so adjustments have not been made for fertilization.

3.6 OPERATIONAL ADJUSTMENT FACTORS

OAFs were used to net-down potential yields to reflect operational conditions. The TEM information was used to localize OAF1 estimates. A base 7.5% adjustment was used with an additional reduction proportional to the area of non-productive (NP) site series in each subzone for the TFL (Table 4). The average NP proportion was 9.7% (7.1% if ESSFwc3 and ESSFwcp3 are excluded). The MOF standard for OAF2 (5%) was used for all subzones.

Table 4. OAF1 by subzone.

Subzone	Area		
	Total (ha)	NP (ha)	NP (%)
SBSvk	77,775	4,263	5.5%
SBSwk1	59,534	5,005	8.4%
ESSFwk2	11,904	1,483	12.5%
ICHvk2	10,264	708	6.9%
SBSmk1	7,026	409	5.8%
ESSFwc3	3,056	3,056	100.0%
ESSFwcp3	1,758	1,758	100.0%
Total	171,318	16,683	9.7%

3.7 SPRUCE WEEVIL

The impact of spruce weevil on yield was modeled by increasing the OAF1 (Table 5). The methodology used to estimate the additional OAF1 due to spruce weevil is outlined in Appendix III. The average additional OAF1 in existing stands was 6.2%, bringing the overall average OAF1 to 20.6% (ranging between 15.6% in the ICHvk2 and 25.6% in the SBSmk1).

Table 5. OAF1 breakdown for existing PHR stands.

Subzone	Area (ha)	OAF1 Component Base	NP Area	Weevil	Total OAF1
SBSvk	20,245	7.5%	5.5%	5.7%	18.7%
SBSwk1	15,888	7.5%	8.4%	7.0%	22.9%
SBSmk1	1,475	7.5%	5.8%	12.3%	25.6%
ICHvk2	1,189	7.5%	6.9%	1.2%	15.6%
ESSFwk2	777	7.5%	12.5%	0.0%	20.0%
Total	*39,573*	*7.5%*	*6.9%*	*6.2%*	*20.6%*

4. FUTURE PHR STANDS

4.1 DEFINITION

Future PHR stands are all stands that will be harvested and regenerated in the future (including NSR areas). The same data layers used for existing PHR stands were used for future PHR stands. Silviculture regimes (Appendix IV) were used to define stand attributes, and TEM polygons provide the ecological information for the adjusted PSI with TRIM information, when applicable. The modeling unit for future PHR stands was BGC site series and PSI.

4.2 POTENTIAL SITE INDEX

The PSIs were assigned based on the results of the SIA project for existing PHR stands. The overall average PSI for all species was 20.9 m (Table 6). Most areas of existing PHR stands was in the 22 m PSI class (Figure 5).

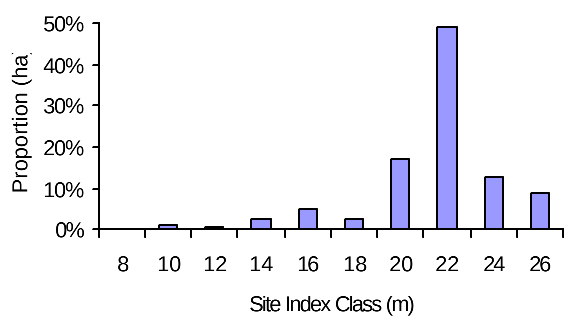

Figure 5. Proportion of area by PSI class for future PHR stands.

Table 6. PSI statistics (m) for future PHR stands.

Spp	Area (ha)	Avg	Min	Max	SD
Pl	61,146	21.9	11.0	26.0	2.3
Sx	93,003	20.3	6.3	25.0	2.9
All	*154,634*	*20.9*	*6.3*	*26.0*	*2.8*

4.3 Species Composition and Density

Stand densities and species composition for future PHR stands were based on the silviculture regimes defined for each site series. For modeling, establishment densities were estimated as 10% more than free-growing densities (to account for mortality between establishment and free-growing). Density distribution and species composition are similar to existing PHR stands (Figure 6,Table 7).

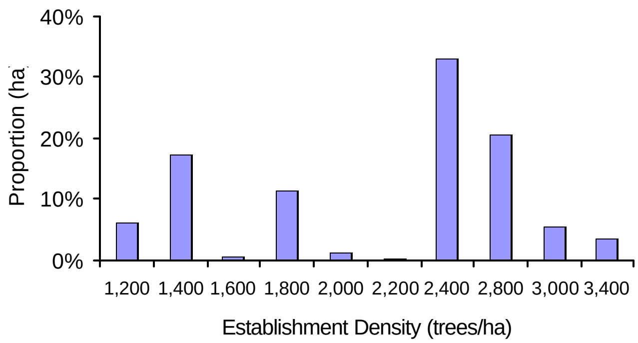

Figure 6. Establishment density distribution.

Table 7. Area by species composition for future PHR stands.

Area (ha)	Sp1	%	Sp2	%	Sp3	%
35,570	Sx	80	Pl	15	Bl	5
29,141	Pl	55	Sx	20	Fd	15
28,043	Sx	90	Bl	10		
10,421	Sx	70	Bl	30		
8,838	Pl	40	Sx	40	Bl	20
8,735	Pl	40	Sx	30	Bl	20
8,625	Sx	80	Pl	10	Bl	5
7,726	Sx	100				
5,481	Pl	60	Sx	30	Bl	10
3,941	Pl	90	Bl	10		
3,496	Pl	70	Bl	20	Sx	10
1,993	Sx	70	Pl	30		
808	Pl	100				
485	Fd	40	Pl	30	Hw	30
377	Pl	50	Fd	30	Bl	20
316	Pl	50	Sx	40	Bl	10
252	Sx	60	Bl	40		
193	Sx	60	Hw	20	Bl	20
11	Pl	60	Bl	25	Fd	15

4.4 Silvicultural Treatments

Starting in 1998, improved Sx stock was planted on all productive sites on TFL 30. Low productivity sites (ICHvk2/03 and 07, SBSmk1/03 and 09, and SBSwk1/02, 03, and 06) will not be planted with improved stock. Canfor expects an 18% volume gain from using improved stock on most sites. The overall average expected volume gain is 17.9% (Table 8).

Neither commercial thinning nor fertilization was accounted for in the MSYTs for future PHR stands. Juvenile spacing will be used in areas regenerated to Pl leading stands to meet free-growing standards. However, potential growth and yield effects of spacing were not explicitly included in MSYTs.

Table 8. Area by subzone with- and without tree improvement.

Subzone	Total Area	Improved Area (ha)	Improved Area (%)	Avg Gain
ESSFwk2	9,733	7,658	78.7%	18.0
ICHvk2	9,236	6,646	72.0%	18.0
SBSmk1	6,322	1,710	27.0%	18.0
SBSvk	65,614	56,057	85.4%	18.0
SBSwk1	51,851	11,722	22.6%	17.6
Total	*142,756*	*83,794*	*58.7%*	*17.9*

4.5 OPERATIONAL ADJUSTMENT FACTORS

The basic OAF1 (7.5%) and the NP-based OAF1 (NP area within a subzone) were identical to those used for existing PHR stands (Table 4). OAF2 reductions followed the MOF standards of 5% for all subzones.

4.6 SPRUCE WEEVIL

The impact of spruce weevil on yield was modeled the same for future PHR stands as was done for existing PHR stands. The average additional OAF1 component from spruce weevil was 4.9%, contributing to a total OAF1 of 19.5% (Table 9). The OAF1 total ranged from 14.9% in the ICHvk2 to 25% in the SBSmk1.

Table 9. Total OAF1 breakdown for future PHR stands.

Subzone	Area	OAF1 Component			Total
	(%)	Base	NP Area	Weevil	OAF1
SBSvk	73,512	7.5%	5.5%	4.5%	17.5%
SBSwk1	54,529	7.5%	8.4%	6.3%	22.2%
ESSFwk2	10,421	7.5%	12.5%	0.0%	20.0%
ICHvk2	9,555	7.5%	6.9%	0.5%	14.9%
SBSmk1	6,617	7.5%	5.8%	11.7%	25.0%
Total	*154,634*	*7.5%*	*7.1%*	*4.9%*	*19.5%*

5. YIELD TABLES

5.1 AGGREGATED YIELD CURVES

Yield tables were produced for each modeling unit. This resulted in 662 MSYTs and 14,591 NSYTs for existing stands and 1,338 MSYTs for future PHR stands. Each mapsheet, polygon number, and subzone was assigned both an average existing tield table and a future yield table. The overall average yield table for natural, existing PHR, and future PHR stands are shown in Figure 7.

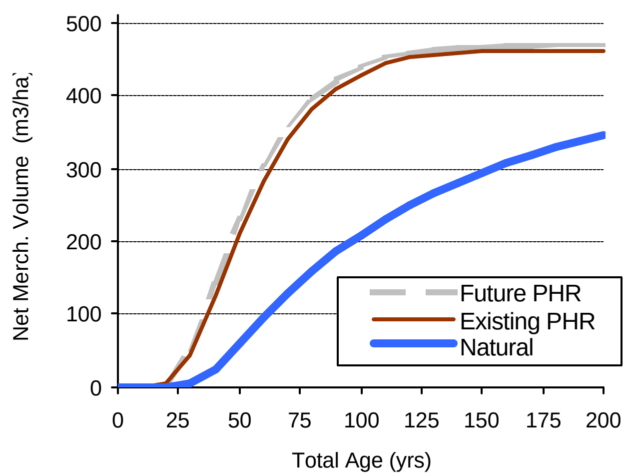

Figure 7. Area-weighted average yield curves (12.5 cm+) for the three curve types.

5.2 NATURAL STANDS

5.2.1 Summary Statistics

Natural stands had an average mean annual increment (MAI) of 2.1 m^3/ha/yr, ranging from 0 to 5 m^3/ha/yr, while culmination age varied between 0 and 350 years, with an average of 111 years (Table 10; Figures 8 and 9). This MAI corresponds to the allowable annual cut (AAC) determined by the Chief Forester for the period 1996-2001.

5.2.2 Volume curves

There were few differences among the average subzone yield curves of natural stands (Figure 9 on page 12). The shape of the yield curves is closer to a slow linear growth than the traditional sigmoid shape associated with yield.

5.3 EXISTING PHR STANDS

5.3.1 Summary Statistics

Existing PHR stands should show a higher yield than current natural stands. MSYTs for existing PHR stands showed an MAI of 5.1 m^3/ha/yr, ranging from 1.7 to 7.5 m^3/ha/yr, while the average culmination age was 72 years, ranging from 60 to 190 years (Table 11; Figure 9). These values are almost 2.5 times higher than the NSYT values.

5.3.2 Volume curves

Average volume curve and volume curves per subzone reflect the productivity of each subzone. The ICHvk2 and SBSvk subzones were above average while the ESSFmk1 and SBSmk1 subzones were below the average yield curve (Figure 9). The low yield of the SBSmk1 is partly due to the spruce weevil impact. For example, in the SBSwk1 (which closely followed the average yield) the reduction due to the spruce weevil was 7% while it was 12% in the SBSmk1. The SBSmk1 subzone is where spruce weevil has the most important impact on yield.

5.4 FUTURE PHR STANDS

5.4.1 Summary Statistics

Average maximum MAI for future PHR stands was 5.3 m^3/ha/yr. Culmination ages varied between 50 years and 240 years with an average of 70 years (Table 12; Figure 9). As expected, these values were very close to the existing PHR stands with slight differences attributed to differences in landbase. Statistics by subzones are presented in Appendix V.

5.4.2 Volume curves

Volume curves for future PHR stands are very similar to those for existing PHR stands (Figure 9). Differences are due to the proportion of each site series in both populations.

Table 10. Growth estimates at culmination age for existing natural stands.

Curve Type / Area	Area (ha)	MAI (m^3/ha/yr)			Culmination Age (yrs)			Culmination Volume (m^3/ha)		
		Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
ESSFwk2 (12.5 cm+)	10,754	1.9	0.0	4.6	121	50	350	214	0[a]	370
ICHvk2 (12.5 cm+)	8,272	2.5	0.2	4.7	106	50	350	246	14	374
SBSmk1 (12.5 cm+)	5,717	2.6	0.1	5.0	105	60	310	257	15	376
SBSvk (12.5 cm+)	53,113	2.1	0.0	4.8	109	50	350	218	11	359
SBSwk1 (12.5 cm+)	41,224	2.2	0.0	4.9	111	0[a]	350	228	0[a]	387
All Areas (12.5 cm+)	*123,440*	*2.1*	*0.0*	*5.0*	*111*	*0*	*350*	*224*	*0*	*387*
All Areas (17.5 cm+)	*123,440*	*2.0*	*0.0*	*4.6*	*125*	*0*	*350*	*237*	*0*	*424*

[a] About 1,850 ha have very low site index estimates.

Table 11. Growth estimates at culmination age for existing PHR stands.

Curve Type / Area	Area (ha)	MAI (m^3/ha/yr)			Culmination Age (yrs)			Culmination Volume (m^3/ha)		
		Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
ESSFwk2 (12.5 cm+)	538	3.4	2.2	4.5	112	90	150	378	328	422
ICHvk2 (12.5 cm+)	1,122	5.9	1.7	7.0	71	60	180	409	272	477
SBSmk1 (12.5 cm+)	1,133	4.1	2.8	6.2	74	60	100	298	254	371
SBSvk (12.5 cm+)	19,059	5.1	1.8	6.9	74	60	190	371	285	465
SBSwk1 (12.5 cm+)	14,729	5.2	1.8	7.5	69	60	120	352	216	453
All Areas (12.5 cm+)	*36,580*	*5.1*	*1.7*	*7.5*	*72*	*60*	*190*	*362*	*216*	*477*
All Areas (17.5 cm+)	*36,580*	*4.7*	*1.5*	*7.4*	*80*	*60*	*200*	*372*	*190*	*473*

Table 12. Growth estimates at culmination age for future PHR stands.

Curve Type / Area	Area (ha)	MAI (m^3/ha/yr)			Culmination Age (yrs)			Culmination Volume (m^3/ha)		
		Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
ESSFwk2 (12.5 cm+)	10,421	3.4	1.5	4.7	106	80	190	357	291	395
ICHvk2 (12.5 cm+)	9,555	6.1	1.2	7.2	69	60	240	395	209	435
SBSmk1 (12.5 cm+)	6,617	4.2	2.0	6.4	70	50	110	279	219	321
SBSvk (12.5 cm+)	73,512	5.7	1.9	7.6	71	60	190	390	283	460
SBSwk1 (12.5 cm+)	54,529	5.2	1.5	7.7	63	50	120	321	174	452
All Areas (12.5 cm+)	*154,634*	*5.3*	*1.2*	*7.7*	*70*	*50*	*240*	*359*	*174*	*460*
All Areas (17.5 cm+)	*154,634*	*5.0*	*1.0*	*7.5*	*76*	*60*	*270*	*364*	*168*	*458*

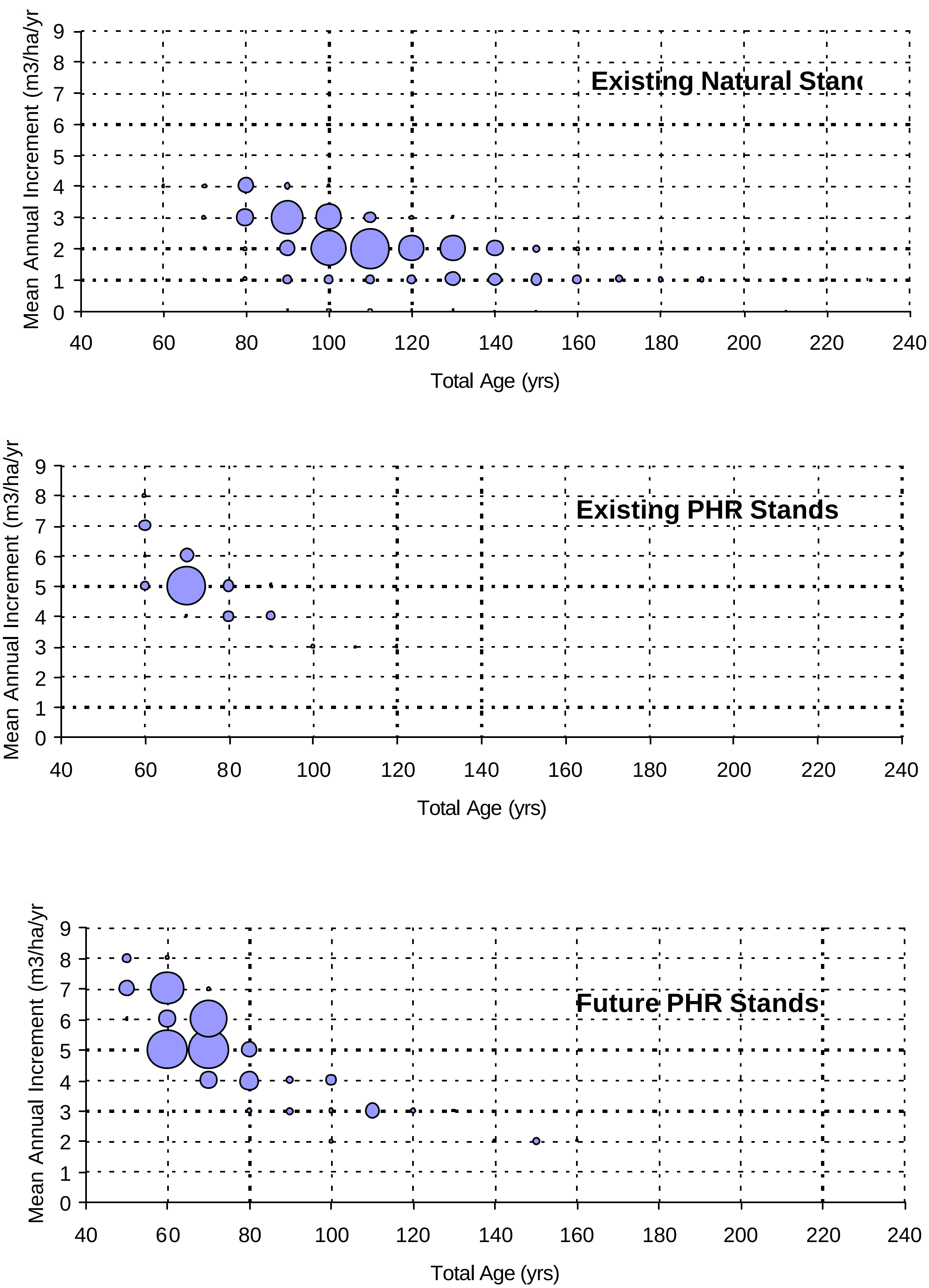

Figure 8. Mean annual increment (MAI) and culmination age for existing natural, existing PHR, and future PHR stands. (Area [ha] at each combination of MAI and culmination age is proportional to bubble size.)

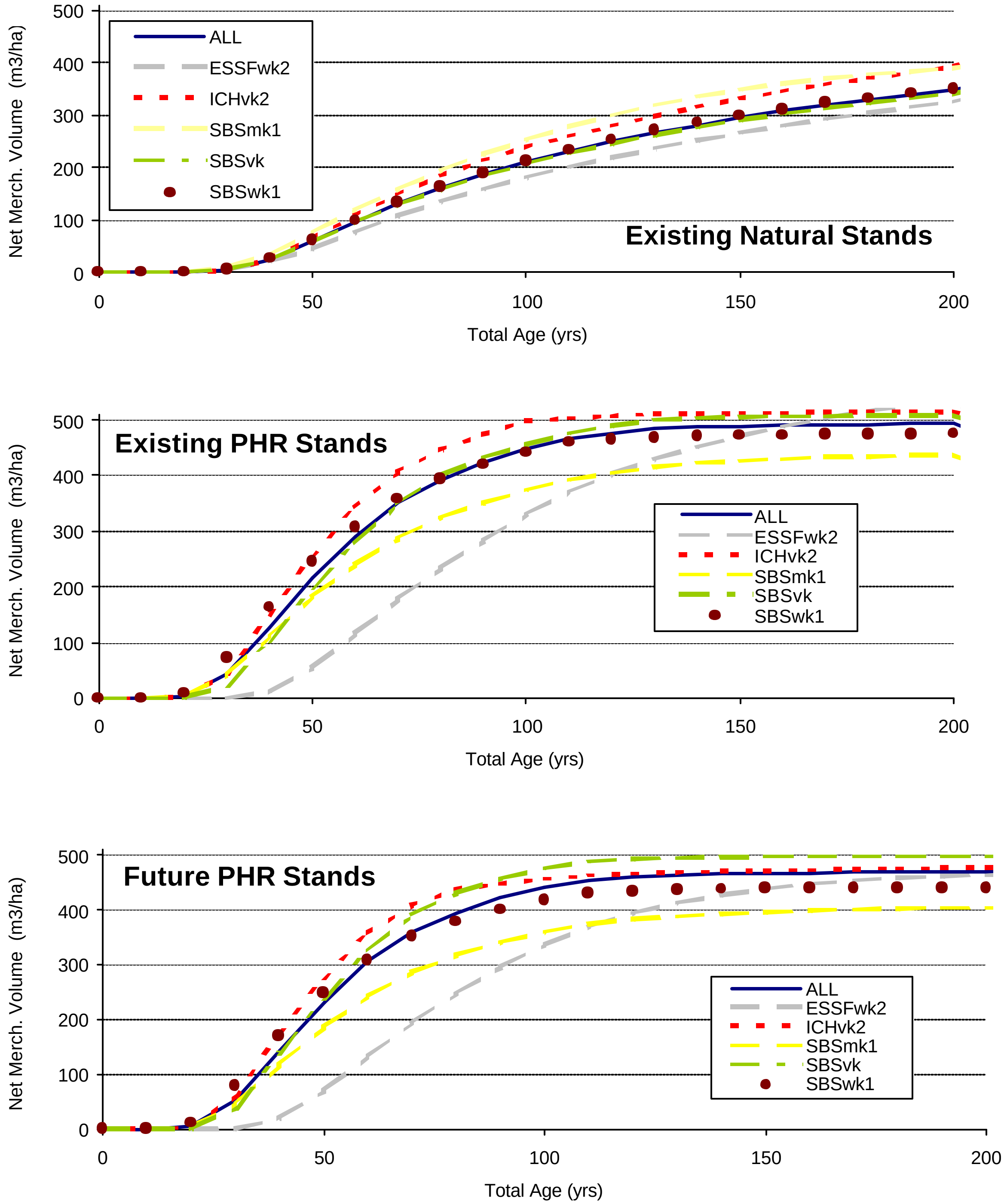

Figure 9. Area-weighted average yield curves (12.5 cm+) for existing natural, existing PHR, and future PHR stands.

APPENDIX I – AREA SUMMARY

Landbase Summary

TFL 30 is located approximately 30 km northeast of Prince George on the McGregor Plateau in the Upper Fraser Region of BC. The TFL is located primarily in the SBS BGC zone and is characterized by spruce and sub-alpine fir forest types. The total area of the TFL is approximately 180,000 ha of which 95% is productive land (Table 13). The current AAC is 350,000 m^3 and is effective from October 1, 1996 to September 30, 2001.

Table 13. TFL 30 landbase summary.

Description	Area (ha)	Area (%)
Non-Productive	9,046	5%
Productive (PFLB)	171,317	95%
Total	*180,363*	*100%*

Ecological Profile

There are three BGC zones and seven subzones in the productive forest landbase (PFLB). The majority of area (about 84%) is in the SBS BGC zone (in the SBSmk1, SBSvk, and SBSwk1 subzones [Figure 10]) There are also small areas in the ICHvk2, ESSFwk2, ESSFwc3, and ESSFwcp3.

Inventory Profile

Most area in the TFL is in spruce (Sx), lodgepole pine (Pl), or balsam (Bl) leading stands (Figure 11). Minor species include Douglas-fir (Fdi), aspen (At), cottonwood (Ac), birch (Ep), black spruce (Sb), western redcedar (Cw), and western hemlock (Hw). Age class 1 stands are about 60% Sx leading, with most others Pl leading (Figure 11). Most area in age class 3-7 stands is Bl leading, and most age class 8 and 9 stands are Sx leading.

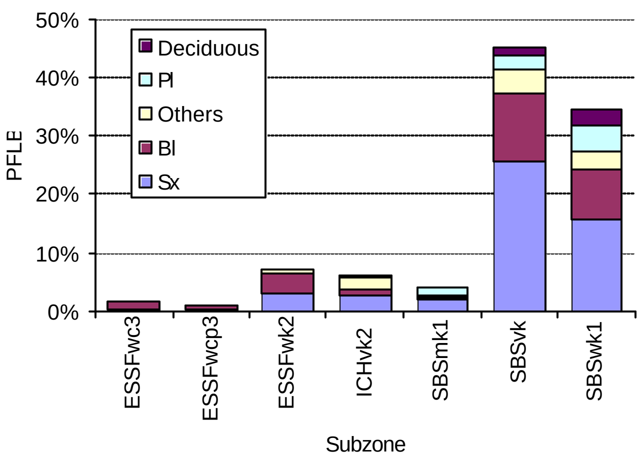

Figure 10. Distribution of area (%) in the PFLB by leading species and BGC subzone.

Figure 11. Distribution of species by age class.

APPENDIX II – VRI ADJUSTMENT PROCESS

Pre-Adjustment Inventory Database

The inventory database was generated using four main overlays. Forest cover information came from the VRI Phase I database using aerial photos taken in 1995. The forest cover information was updated to December 31, 2000 using the Forest Development Plan information. Stands harvested between 1995 and 2000 were assumed to be in the process of being regenerated using the silviculture regimes developed for this project. Stands were assumed to have been harvested at the beginning of the growing season and a one-year regeneration delay was assumed. Stands harvested in 1999 were assumed to be one year old; those harvested in 1998, two years old; and so on. Only future yield tables were generated for these stands (existing yield tables were excluded). Ecological classification information came from the recent TEM and elevation came from TRIM.

Ground Sampling Information

The PFLB landbase was statistically adjusted using ground information (VRI Phase II). A total of 267 sample plots, both full VRI and timber-emphasis plots, were collected between 1997 and 1999 (Table 14). Since most plots were collected after the 1998 growing season, we assumed that the adjustment process resulted in a statistically adjusted inventory to the end of the 1998 growing season. All sample points in the TFL had the same probability of selection, therefore all plots have the same statistical weight.

Table 14. Distribution of plot types by year.

Plot Type	1997	1998	1999	Total
Full VRI Plots	41	49		90
Timber Emphasis Plots	3	157	17	177
Total	*44*	*206*	*17*	*267*

The sample plot locations were selected using the former forest-cover inventory. When overlaid with the new VRI forest cover, many sample clusters were split across more than one polygon. The post-processed GPS locations, maps, and aerial photos were used to reassign, to each plot within a cluster, the VRI polygon in which the plot was located. Only satellite plots in the same polygon as the integrated plot center were used for analysis. In a few cases, satellite plots that were originally outside the sampled polygon, and therefore not measured by the crew, were included in the same polygon as the integrated plot center. These plots represent missing information and create a sampling bias. However, the bias is assumed to be negligible.

Adjustment Process

The adjustment process followed the method developed to adjust the Forest Inventory Production (FIP) files on the Fraser Timber Supply Area (TSA) in 1997.[2] This method accounts for the potential bias in both the inventory and in the yield model. First, height and age are

[2] Ministry of Forests 1997. Fraser TSA: File Adjustment Project – File Adjustment Recommendations. Unpublished Report MOF ORCS: 13300-20/TSASDJMT, Victoria. 10 p.

adjusted using the ratio of means between ground-sample and photo-interpretation data. A VDYP volume (using *Batch VDYP version 6.6d*) is generated next using the adjusted height and age, and the unadjusted species composition, stocking class, and crown closure class. The VDYP volume is then adjusted using the ratio of means estimated from the ground-sampled volume.

Adjustment Statistics

Height and age were both adjusted with an overall ratio since post-stratifying by leading species did not show any significant difference among species. While age was over-estimated, there was no significant change in height. Height marginally decreased from 19.4 to 19.2 m for the entire population (Table 15). Age decreased from 106 to 100 years in the inventory database, a 6% average decrease (Table 16).

Table 15. Adjustment statistics for height (m).

Leading Species	Area (ha)	Phase I Pop Avg	n	Phase II Sample Avg	Phase I Sample Avg	Corr (r)	Adjusted Pop Avg	Ratio
Balsam	43,214	21.8	52	21.8	21.7	51.2%	22.0	1.006
Spruce	100,472	20.9	108	28.3	29.2	80.5%	20.2	0.967
Others	27,631	10.5	13	26.8	24.1	81.5%	11.7	1.111
All	*171,317*	*19.4*	*173*	*26.2*	*26.6*	*76.7%*	*19.2*	*0.986*

Note: Phase I is the unadjusted inventory database; Phase II is the VRI ground sample data.

Table 16. Adjustment statistics for age (yrs).

Leading Species	Area (ha)	Phase I Pop Avg	n	Phase II Sample Avg	Phase I Sample Avg	Corr (r)	Adjusted Pop Avg	Ratio
Balsam	43,214	124.4	52	109.9	120.5	35.0%	113.4	0.912
Spruce	100,472	113.2	108	149.1	158.0	60.9%	106.8	0.944
Others	27,631	52.9	13	120.3	122.5	73.9%	52.0	0.982
All	*171,317*	*106.3*	*173*	*135.0*	*144.0*	*61.3%*	*99.7*	*0.938*

Once the polygon labels were adjusted for height and age, the average VDYP volume was 185 m3/ha (Table 17). After adjustment the overall average volume was 148.8 m3/ha, an overall decrease of 20%. The adjustment change ranged from a decreased of 31% for spruce-leading polygons to a 4% increase for balsam-leading polygons.

Table 17. Adjustment statistics for net merchantable volume (m^3/ha).

Leading Species	Area (ha)	Phase I Pop Avg		Phase II Sample Avg	Phase I Sample Avg	Corr (r)	Adjusted Pop Avg	Ratio
Balsam	43,214	197.7	74	207.8	199.7	4.9%	205.7	1.041
Spruce	98,077	205.0	142	198.9	288.1	55.6%	141.6	0.690
Others	30,026	101.3	20	206.7	231.3	56.2%	90.5	0.894
All	*171,317*	*185.0*	*236*	*202.4*	*255.5*		*148.8*	*0.804*

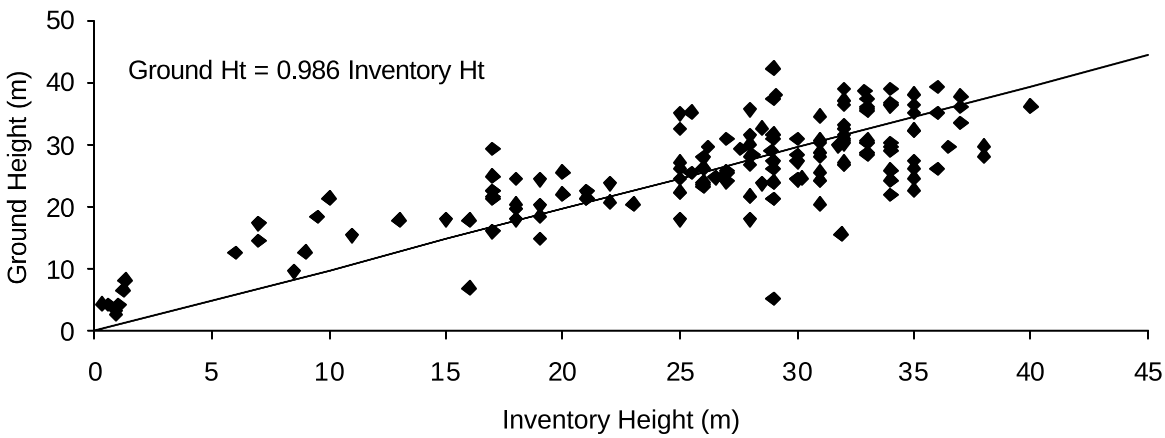

Figure 12. Scattergram of ground height versus inventory height.

Figure 13. Scattergram of ground total age versus inventory total age.

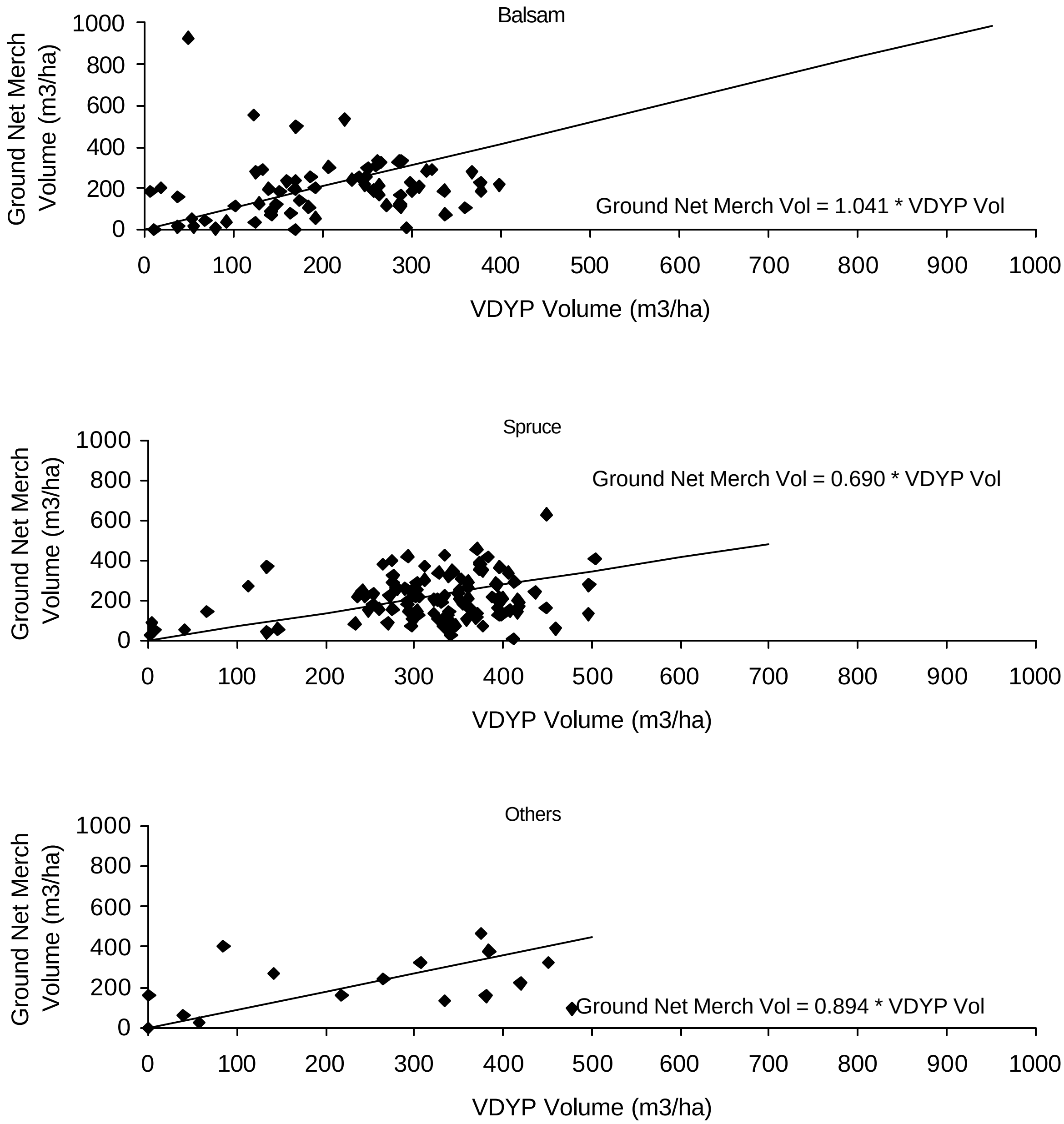

Figure 14. Scattergram of net merchantable volume versus VDYP volume (adjusted for height and age.)

Projection Method

Following adjustment, the inventory was statistically valid as of December 31, 1998. VDYP was used to project the inventory to year 2000. Adjusted attributes were used to generate yield estimates in 1998 and 2000 for each polygon. The yield difference for this two-year growth period was added to the adjusted inventory attributes.

APPENDIX III – SPRUCE WEEVIL IMPACT

Data were collected in the summer of 1999 to assess the level of spruce weevil attack on the TFL. This was done by J.S. Thrower & Associates Ltd. in conjunction with the SIA project. Data were collected in 64 plots randomly located throughout Pl-leading and Sx-leading stands approximately 15-80 years total age in all subzones in the TFL below 1,000 m. Data collected on each plot included: total stand density, number of Sx stems, number of attacks on each Sx tree, and presence/absence of spruce weevil damage in the 1998 leader. Only 42 plots where age was less than 40 were used in the analysis (it was difficult to identify attack accurately in older, taller trees). This information was used to estimate the attack rate using a method similar to the one developed by Stuart Taylor, *RPF* (MOF – Prince George Forest Region).[3]

Taylor's equation predicts attack rate from elevation, age, and number of Sx stems/ha. The same equation was fitted into the 1999 data. The age coefficient was not significant, probably due to the small sample size and the narrow range of data. The regression that was found yielded lower results than Taylor's. By multiplying all regression coefficients by 2.5, the adjusted predictions were similar to Taylor's. The final attack rate prediction equation was:

[1] $$\text{Attack Rate} \;?\; 429.4 \;?\; 11.02 \;?\; LN(\text{Sx stems/ha}) \;?\; 50.03 \;?\; LN(\text{Elevation})$$

where attack rate is in percent and elevation in m. Predicted attack rates below 0% were set to 0%, while predicted rates above 20% were set to 20%. We also assumed the predicted attack rate was 0 if elevation was above 800 m or if there were less than 500 Sx stems/ha.

The predicted attack rate was used to calculate an additional OAF1, to be added to the basic 7.5% and the proportion of NP area within the subzone. If $OAF1_a$ was 7.5%, as applied to all polygons, and $OAF1_b$ was the proportion of NP area within a subzone, and $OAF1_c$ was the reduction due to spruce weevil hazard, then $OAF1_c$ was calculated as:[4]

[2] $$OAF1_c \;?\; \text{Attack Rate} \;?\; ?\frac{OAF1_a \;?\; OAF1_b}{2}?$$

where attack rate was predicted from Equation [1]. Predicted $OAF1_c$ less than 0 were set to 0.

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[3] Taylor, S.P. 1997. Relationships between white spruce vulnerability of the white pine weevil and ecological site conditions in the interior of British Columbia. Faculty of Natural Resources and Environmental Studies. Univ. Northern British Columbia. 75 p.
[4] Stuart Taylor, personal communication, 29 May 2000.

APPENDIX IV – SILVICULTURE REGIMES

Table 18. Silviculture regimes for TFL 30.

Ecological Areas					Harvest & Trtmt Type			Regeneration				
								Regen Type and Establishment				
BGC Unit	BGC Area (ha)	Site Series	Area (%)	Site Series Area (ha)	Managed for Timber (Y/N)	Trtmt Group	Harvest Method	Regen Type (P/N/B)	Regen Delay (yrs)	Plant Density (no/ha)	Survival (%)	Density at FG (no/ha)
SBSvk	84,108	01	37.0	31,082	Y	A	CC	B	1	1500	0.96	2200
SBSvk		02	0.3	243	Y	B	CC	B	1	1500	0.96	1800
SBSvk		03	1.7	1,412	Y	B	CC	P	1	1500	0.96	1800
SBSvk		04	7.1	5,996	Y	C	CC	B	1	1500	0.96	2200
SBSvk		05	10.6	8,921	Y	D	CC	P	1	1500	0.92	1300
SBSvk		06	7.1	6,003	Y	D	CC	P	1	1500	0.92	1300
SBSvk		07	2.9	2,414	Y	D	CC	P	1	1500	0.92	1300
SBSvk		08	2.6	2,150	Y	D	CC	P	1	1500	0.92	1300
SBSvk		09	0.1	98	Y	E	CC	P	1	1500	0.90	1100
SBSvk		10	2.7	2,249	Y	E	CC	P	1	1500	0.90	1100
SBSvk		11	11.3	9,492	Y	E	CC	P	1	1500	0.90	1100
SBSvk		96	0.3	289	N							
SBSvk		97	1.8	1,500	N							
SBSvk		98	0.0	20	N							
SBSvk		99	0.7	572	N							
SBSvk		00	13.9	11,667	N							
SBSwk1	60,225	01	33.5	20,171	Y	F	CC	B	1	1500	0.96	2500
SBSwk1		02	0.0	2	Y	G	CC	B	1	1500	0.96	2000
SBSwk1		03	0.5	295	Y	G	CC	B	1	1500	0.96	2000
SBSwk1		04	3.2	1,898	Y	G	CC	B	1	1500	0.96	1600
SBSwk1		05	10.9	6,544	Y	F	CC	P	1	1500	0.96	2500
SBSwk1		06	6.1	3,694	Y	H	CC	P	1	1500	0.96	1600
SBSwk1		07	6.3	3,822	Y	H	CC	P	1	1500	0.96	1600
SBSwk1		08	9.4	5,648	Y	H	CC	P	1	1500	0.96	2200
SBSwk1		09	5.9	3,568	Y	I	CC	P	1	1500	0.92	1300
SBSwk1		10	0.3	188	Y	I	CC	P	1	1500	0.92	1300
SBSwk1		11	4.1	2,449	N							
SBSwk1		12	0.0	15	N							
SBSwk1		92	0.3	174	N							
SBSwk1		93	0.1	60	N							
SBSwk1		94	0.2	103	N							
SBSwk1		95	4.1	2,489	Y	I				1500	0.92	1300
SBSwk1		00	15.1	9,103	N							
ESSFwk2	11,365	01	52.2	5,937	Y	J	CC	P	1	1500	0.95	1700
ESSFwk2		02	7.8	881	Y	J	CC	P	1	1500	0.95	1700
ESSFwk2		03	0.2	23	Y	J	CC	P	1	1500	0.95	1700
ESSFwk2		04	5.1	576	Y	K	CC	P	1	1500	0.92	1300
ESSFwk2		05	12.9	1,466	Y	K	CC	P	1	1500	0.92	1300
ESSFwk2		06	3.8	432	Y	K	CC	P	1	1500	0.92	1300
ESSFwk2		31	2.0	228	N							
ESSFwk2		00	16.0	1,821	N							
ICHvk2	10,522	01	51.2	5,389	Y	L	CC	B	1	1500	0.96	2800
ICHvk2		02	1.5	156		M		B	1	1500	0.92	2200
ICHvk2		03	4.5	477		N		B	1	1500	0.92	2200
ICHvk2		04	19.0	1,997		L		B	1	1500	0.96	2800
ICHvk2		05	10.0	1,048		L		B	1	1500	0.96	2800
ICHvk2		06	1.3	132		O		B	1	1500	0.92	1600

Ecological Areas					Harvest & Trtmt Type			Regeneration					
								Regen Type and Establishment					
BGC Unit	BGC Area (ha)	Site Series	Area (%)	Site Series Area (ha)	Managed for Timber (Y/N)	Trtmt Group	Harvest Method	Regen Type (P/N/B)	Regen Delay (yrs)	Plant Density (no/ha)	Survival (%)	Density at FG (no/ha)
ICHvk2		07	0.9	98		O		B	1	1500	0.92	1200
ICHvk2		00	11.7	1,226	N			P				
SBSmk1	7,038	01	23.5	1,651	Y	P	CC	P	1	1500	0.96	3000
SBSmk1		03	0.0	1	Y	Q	CC	P	1	1500	0.92	2200
SBSmk1		04	2.0	141	Y	P	CC	P	1	1500	0.96	3000
SBSmk1		05	9.2	648	Y	P	CC	P	1	1500	0.96	3000
SBSmk1		06	16.2	1,138	Y	P	CC	P	1	1500	0.96	3000
SBSmk1		07	12.1	853	Y	P	CC	P	1	1500	0.96	3000
SBSmk1		08	4.6	321	Y	Q	CC	P	1	1500	0.96	2200
SBSmk1		09	16.3	1,145	Y	R	CC	P	1	1500	0.9	1500
SBSmk1		10	3.0	211	N			P				
SBSmk1		91	3.1	221	N							
SBSmk1		00	10.1	709	N							
ESSFwc3	2,480	01	75.9	1,881								
ESSFwc3		02	12.3	306								
ESSFwc3		03	8.9	220								
ESSFwc3		00	3.0	73								
ESSFwcp3	1,331	01	57.5	766								
ESSFwcp3		02	18.4	245								
ESSFwcp3		03	17.7	236								
ESSFwcp3		04	0.0	0								
ESSFwcp3		90	0.6	8								
ESSFwcp3		00	5.7	76	N							
AT	95	01	1.4	1								
AT		02	90.4	86								
AT		51	0.6	1								
AT		00	7.2	7								
Blank	3,006	00			N							

Ecological Areas					Species Composition at Free Growing or Post-Spacing										Silviculture Treatment Specifications				
															Treatments		Genetic Improvement		
BGC Unit	BGC Area (ha)	Site Series	Site Series Prop (%)	Site Series Area (ha)	Sp 1	Sp1 %	Sp2	Sp2 %	Sp3	Sp3 %	Sp4	Sp4 %	Sp5	Sp5 %	Trmt Code	Trmt Prop (%)	Prop Imprvd Stock (%)	Year	Gain (%)
SBSvk	84,108	01	37.0	31,082	Sx	80	Pl	15	Bl	5					N		80	1999	18
SBSvk		02	0.3	243	Sx	70	Pl	30							N		70	1999	18
SBSvk		03	1.7	1,412	Sx	70	Pl	30							N		70	1999	18
SBSvk		04	7.1	5,996	Sx	100									N		100	1999	18
SBSvk		05	10.6	8,921	Sx	90	Bl	10							N		90	1999	18
SBSvk		06	7.1	6,003	Sx	90	Bl	10							N		90	1999	18
SBSvk		07	2.9	2,414	Sx	90	Bl	10							N		90	1999	18
SBSvk		08	2.6	2,150	Sx	90	Bl	10									90		18
SBSvk		09	0.1	98	Sx	90	Bl	10							N		90		18
SBSvk		10	2.7	2,249	Sx	90	Bl	10							N		90		18
SBSvk		11	11.3	9,492	Sx	90	Bl	10							N		90		18
SBSvk		96	0.3	289															
SBSvk		97	1.8	1,500															
SBSvk		98	0.0	20															
SBSvk		99	0.7	572															
SBSvk		00	13.9	11,667															
SBSwk1	60,225	01	33.5	20,171	Pli	55	Sx	20	Fdi	15	Bl	10			N		20	1999	18
SBSwk1		02	0.	2	Pli	90	Bl	10							N				
SBSwk1		03	0.5	295	Pli	50	Fd	30	Bl	20					N				
SBSwk1		04	3.2	1,898	Pli	55	Sx	20	Fdi	15	Bl	10			N		20	1999	18
SBSwk1		05	10.9	6,544	Pli	40	Sx	30	Bl	20	Fdi	10			N		30	1999	18
SBSwk1		06	6.1	3,694	Pli	90	Bl	10							N				
SBSwk1		07	6.3	3,822	Pli	55	Sx	20	Fdi	15	Bl	10			N		20	1999	18
SBSwk1		08	9.4	5,648	Pli	40	Sx	40	Bl	20					N		40	1999	18
SBSwk1		09	5.9	3,568	Pli	70	Bl	20	Sx	10					N		10	1999	18
SBSwk1		10	0.3	188	Pli	40	Sx	40	Bl	20					N		40	1999	18
SBSwk1		11	4.1	2,449															
SBSwk1		12	0.0	15															
SBSwk1		92	0.3	174															
SBSwk1		93	0.1	60															
SBSwk1		94	0.2	103															
SBSwk1		95	4.1	2,489	Pli	40	Sx	40	Bl	20					N		40	2002	18
SBSwk1		00	15.1	9,103															
ESSFwk2	11,365	01	52.2	5,937	Sx	70	Bl	30							N		70	1999	18
ESSFwk2		02	7.8	881	Sx	70	Bl	30							N		70	1999	18
ESSFwk2		03	0.2	23	Sx	70	Bl	30							N		70	1999	18
ESSFwk2		04	5.1	576	Sx	70	Bl	30							N		100	1999	18
ESSFwk2		05	12.9	1,466	Sx	70	Bl	30							N		100	1999	18
ESSFwk2		06	3.8	432	Sx	70	Bl	30							N		100	1999	18
ESSFwk2		31	2.0	228															
ESSFwk2		00	16.0	1,821															
ICHvk2	10,522	01	51.2	5,389	Sx	80	Pl	10	Bl	5	Hw	5			N		80	1999	18
ICHvk2		02	1.5	156	Sx	60	Hw	20	Bl	20							60	1999	18
ICHvk2		03	4.5	477	Fd	40	Pl	3	Hw	30									
ICHvk2		04	19.0	1,997	Sx	80	Pl	10	Bl	5	Hw	5			N		80	1999	18
ICHvk2		05	10.0	1,048	Sx	80	Pl	10	Bl	5	Hw	5			N		60	1999	18
ICHvk2		06	1.3	132	Sx	60	Bl	40									60	1999	18
ICHvk2		07	0.9	98	Sx	60	Bl	40											

Ecological Areas					Species Composition at Free Growing or Post-Spacing										Silviculture Treatment Specifications				
															Treatments		Genetic Improvement		
BGC Unit	BGC Area (ha)	Site Series	Site Series Prop (%)	Site Series Area (ha)	Sp 1	Sp1 %	Sp2	Sp2 %	Sp3	Sp3 %	Sp4	Sp4 %	Sp5	Sp5 %	Trmt Code	Trmt Prop (%)	Prop Imprvd Stock (%)	Year	Gain (%)
ICHvk2		00	11.7	1,226															
SBSmk1	7,038	01	23.5	1,651	Pli	60	Sx	30	Bl	10							30	1999	18
SBSmk1		03	0.0	1	Pli	60	Bl	25	Fdi	15									
SBSmk1		04	2.0	141	Pli	60	Sx	30	Bl	10							30	1999	18
SBSmk1		05	9.2	648	Pli	60	Sx	30	Bl	10							30	1999	18
SBSmk1		06	16.2	1,138	Pli	60	Sx	30	Bl	10							30	1999	18
SBSmk1		07	12.1	853	Pli	60	Sx	30	Bl	10							30	1999	18
SBSmk1		08	4.6	321	Pli	50	Sx	40	Bl	10							40	1999	18
SBSmk1		09	16.3	1,145	Pli	100													
SBSmk1		10	3.0	211															
SBSmk1		91	3.1	221															
SBSmk1		00	10.1	709															
ESSFwc3	2,480	01	75.9	1,881															
ESSFwc3		02	12.3	306															
ESSFwc3		03	8.9	220															
ESSFwc3		00	3.0	73															
ESSFwcp3	1,331	01	57.5	766															
ESSFwcp3		02	18.4	245															
ESSFwcp3		03	17.7	236															
ESSFwcp3		04	0.0	0															
ESSFwcp3		90	0.6	8															
ESSFwcp3		00	5.7	76															
AT	95	01	1.4	1															
AT		02	90.4	86															
AT		51	0.6	1															
AT		00	7.2	7															
Blank	3,006	00																	

APPENDIX V – SUBZONE SUMMARIES FOR FUTURE PHR STANDS

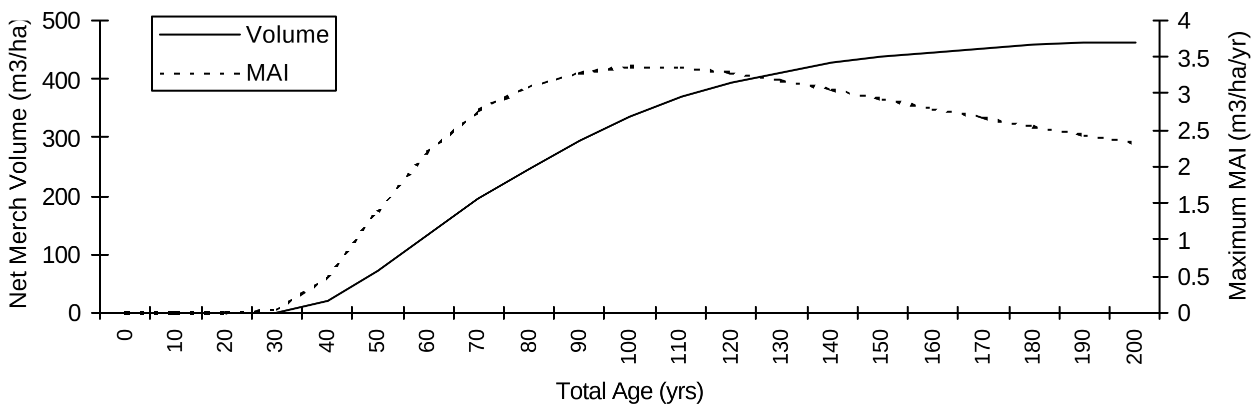
TFL 30 – ESSFwk2

Table 19. Avg. TIPSY output for the ESSFwk2 subzone.

Site Series	Area (ha)	Area (%)	Max MAI (m^3/ha/yr)	Culm Age (yr)	Culm Vol (m^3/ha)
01	6,335	61%	3.3	108	356
02	903	9%	2.4	136	327
03	150	1%	3.6	100	362
	922	9%	3.6	101	365
	1,735	17%	4.3	86	371
	376	4%	3.3	108	356
Avg			3.4	106	357
Min			1.5	80	291
Max			4.7	190	395
Std Dev			0.5	14	16

Table 20. Avg. TIPSY input for the ESSFwk2.

Attribute	Value
Total Area	10,421
Site Index	15.2
Density	1,742
Proportion Fd	0
Proportion Pl	0
Proportion Sx	100%
OAF1	18.6%
OAF2	5.0%



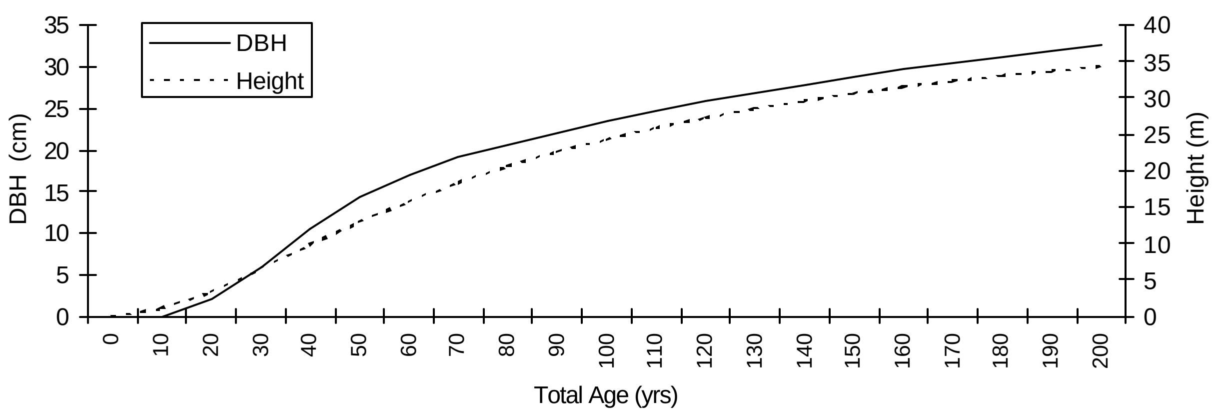


Figure 15. Volume and diameter over age curves for the ESSFwk2 subzone on TFL 30.

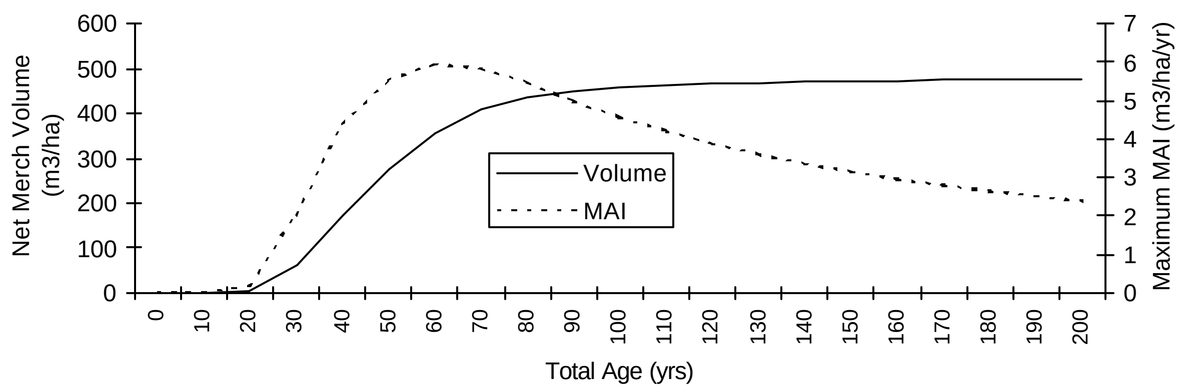
TFL 30 – ICHvk2

Table 21. Avg. TIPSY input for the ICHvk2.

Attribute	Value
Total Area	9,555
Site Index	21.9
Density	2,996
Proportion Fd	2%
Proportion Hw	6%
Proportion Pl	11%
Proportion Sx	81%
OAF1	13.9%
OAF2	5.0%

Table 22. Avg. TIPSY output for the ICHvk2 subzone.

Site Series	Area (ha)	Area (%)	Max MAI (m^3/ha/yr)	Culm Age (yr)	Culm Vol (m^3/ha)
01	5,023	53%	6.6	60	395
02	193	2%	1.9	169	312
03	485	5%	2.4	120	288
04	2,160	23%	5.7	70	400
05	1,442	15%	7.2	60	431
06	201	2%	5.1	80	405
07	51	1%	1.8	181	326
Avg			6.1	69	395
Min			1.2	60	209
Max			7.2	240	435
Std Dev			1.2	22	33



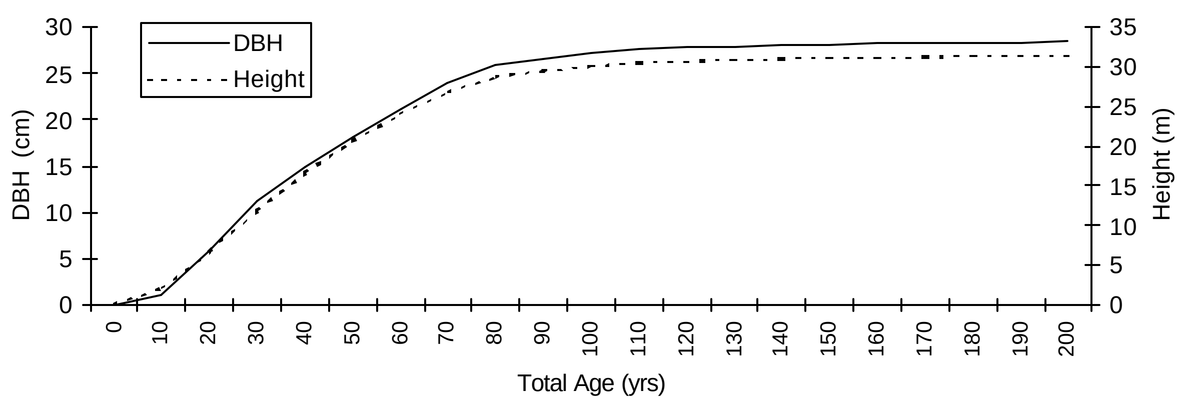


Figure 16. Volume and diameter over age curves for the ICHvk2 subzone on TFL 30.

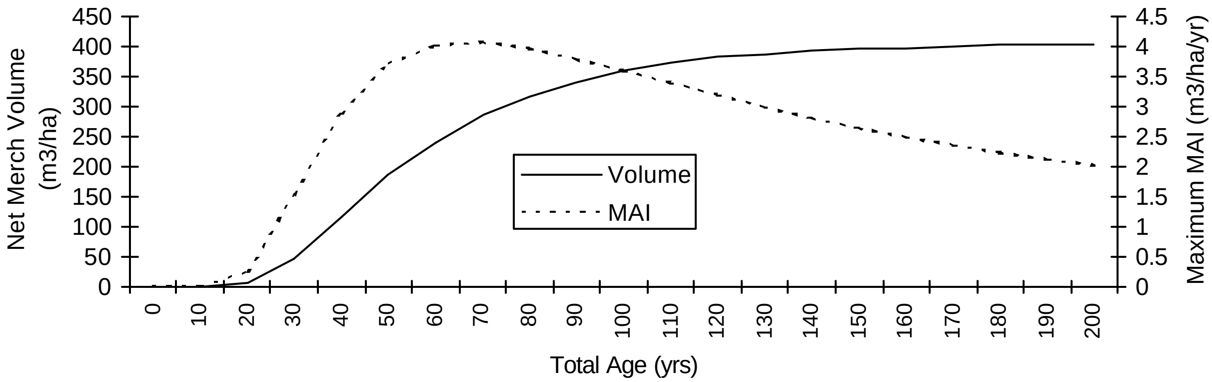
TFL 30 – SBSmk1

Table 23. Avg. TIPSY input for the SBSmk1.

Attribute	Value
Total Area	6,617
Site Index	19.5
Density	3,055
Proportion Fd	0%
Proportion Pl	64%
Proportion Sx	36%
OAF1	23.3%
OAF2	5.0%

Table 24. Avg. TIPSY output for the SBSmk1 subzone.

Site Series	Area (ha)	Area (%)	Max MAI (m^3/ha/yr)	Culm Age (yr)	Culm Vol (m^3/ha)
01	2,057	31%	4.6	60	277
03	11	0%	2.0	110	219
04	151	2%	3.5	80	283
05	884	13%	4.3	70	298
06	1,358	21%	2.9	90	258
07	1,031	16%	5.0	60	302
08	316	5%	6.4	50	321
09	808	12%	3.2	80	254
Avg			4.2	70	279
Min			2.0	50	219
Max			6.4	110	321
Std Dev			1.0	13	20



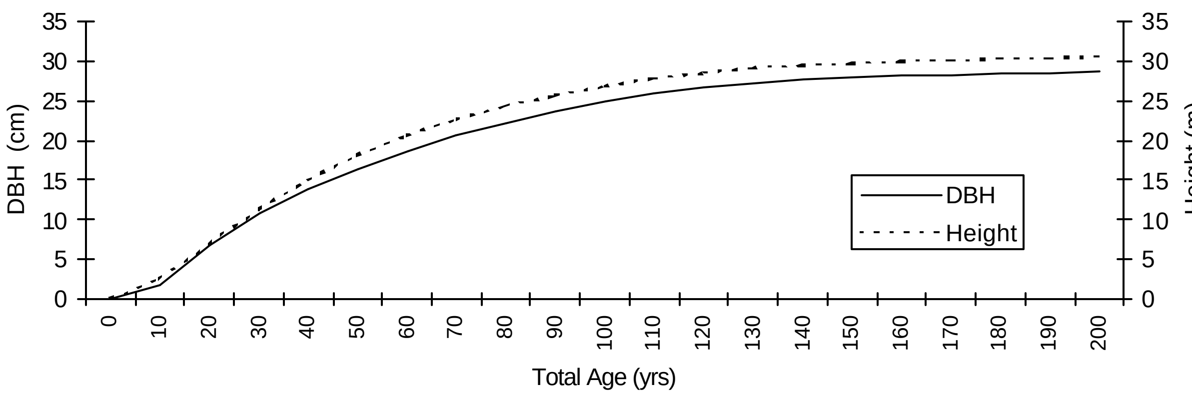


Figure 17. Volume and diameter over age curves for the SBSmk1 subzone on TFL 30.

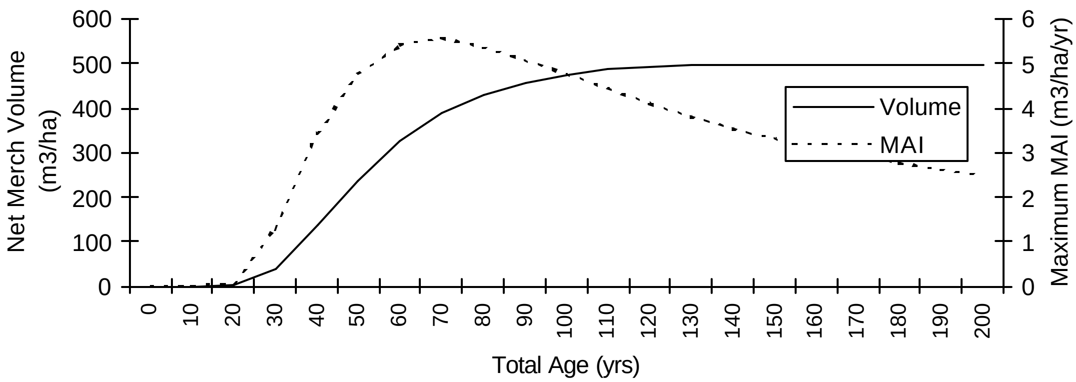
TFL 30 – SBSvk

Table 25. Avg. TIPSY input for the SBSvk

Attribute	Value
Total Area	73,512
Site Index	20.8
Density	2,002
Proportion Fd	0
Proportion Pl	8%
Proportion Sx	92%
OAF1	16.3%
OAF2	5.0%

Table 26. Avg. TIPSY output for the SBSvk subzone

Site Series	Area (ha)	Area (%)	Max MAI (m^3/ha/yr)	Culm Age (yr)	Culm Vol (m^3/ha)
01	35,750	49%	5.7	70	399
02	276	0%	2.9	113	328
03	1,717	2%	4.2	82	343
04	7,726	11%	5.3	71	371
05	10,626	14%	6.4	61	385
06	5,208	7%	4.7	80	380
07	1,556	2%	6.9	60	417
08	1,118	2%	2.1	151	317
09	78	0%	1.9	161	307
10	2,095	3%	5.0	80	399
11	7,362	10%	6.4	62	400
Avg			5.7	71	390
Min			1.9	60	283
Max			7.6	190	460
Std Dev			0.8	12	31



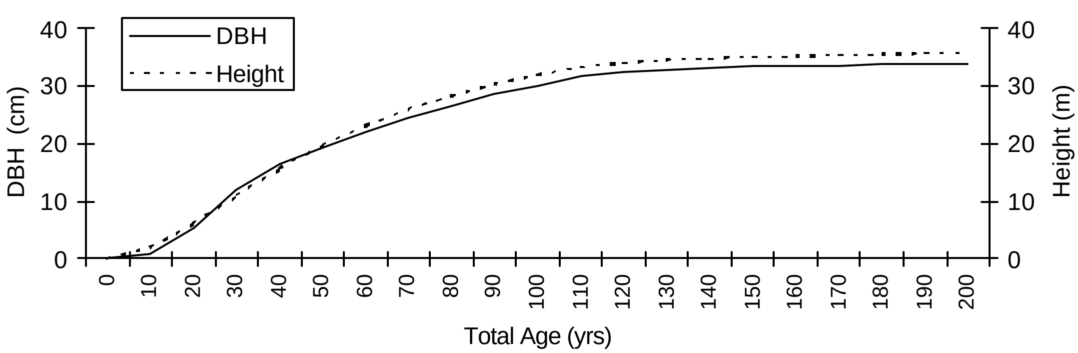


Figure 18. Volume and diameter over age curves for the SBSvk subzone on TFL 30.

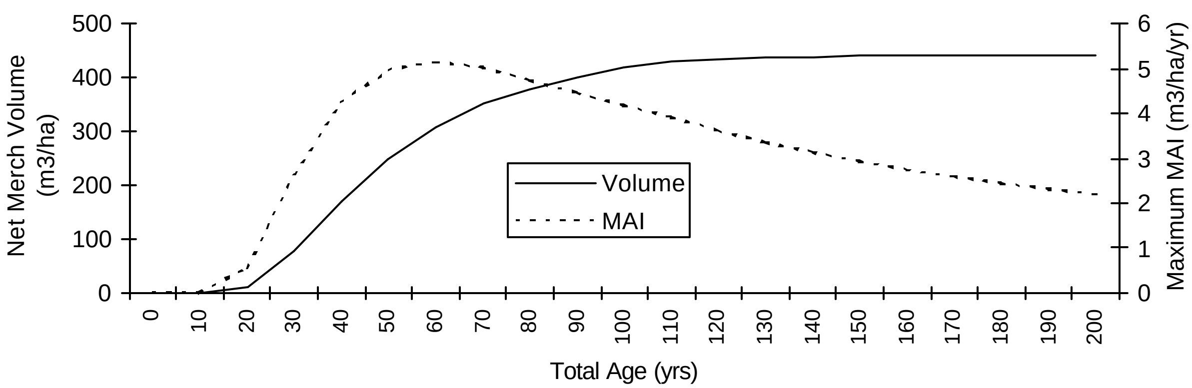
TFL 30 – SBSwk1

Table 27. Avg. TIPSY input for the SBSwk1.

Attribute	Value
Total Area	54,529
Site Index	22.2
Density	2,386
Proportion Fd	10%
Proportion Pl	54%
Proportion Sx	37%
OAF1	20.7%
OAF2	5.0%

Table 28. Avg. TIPSY output for the SBSwk1 subzone.

Site Series	Area (ha)	Area (%)	Max MAI (m^3/ha/yr)	Culm Age (yr)	Culm Vol (m^3/ha)
01	22,876	42%	4.8	60	292
02	16	0%	1.7	113	189
03	377	1%	2.4	100	244
04	2,523	5%	4.2	80	332
05	8,735	16%	5.0	70	353
06	3,925	7%	5.2	60	314
07	3,742	7%	6.8	60	408
08	6,818	13%	7.0	50	350
09	3,496	6%	4.2	70	291
10	338	1%	6.7	50	336
95	1,683	3%	4.5	70	316
Avg			5.2	63	321
Min			1.5	50	174
Max			7.7	120	452
Std Dev			1.0	8	40



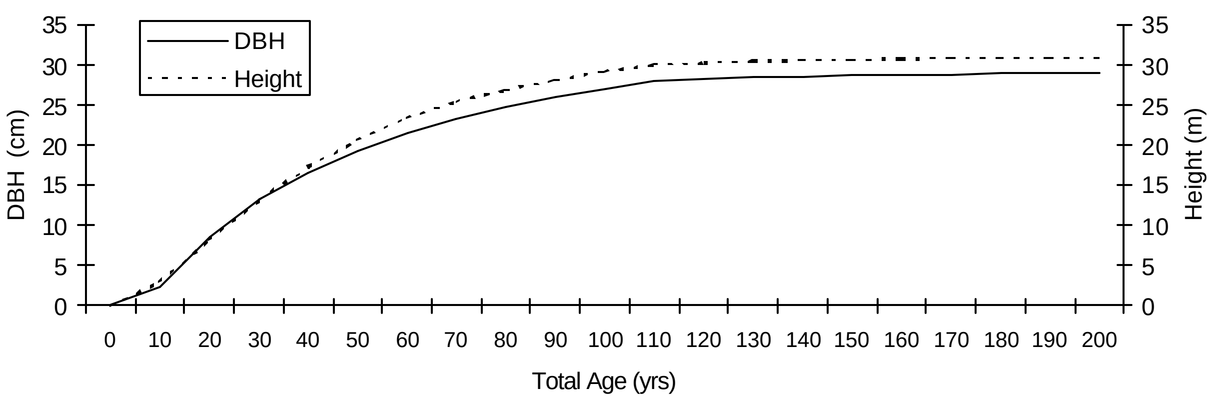


Figure 19. Volume and diameter over age curves for the SBSwk1 subzone on TFL 30.