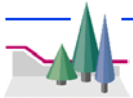


## Timber Supply Analysis for DFAM Licensees

# *The TSR Data Package – The Road Map to a Timber Supply Analysis*

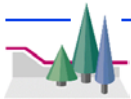
Reference: Technical Workshop Course Notes, Sections 5.0, 6.0



## DFAM Data Package - Contents

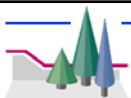
The data package provides information on:

1. forest and other resource inventories and adjustments
2. definition of the land base suitable for timber harvesting
3. classification of the land base into management zones and growth and yield classes (analysis units)
4. development and provision of timber growth and yield
5. forest protection and salvage
6. resource management emphasis
7. timber supply analysis methods including model choice and management scenarios



## 1. Forest & other resource inventories/adjustments

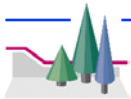
Issue or Data	Description, Source	Coverage Name	Version or Date Stamp
<b>Administrative and Land Base Issues</b>			
TSA and TFL boundaries	Boundary for TSA/TFL, Ministry of Forests	ttsa_ar	2002 Update
Forest inventory zones	Timberline calculated FIZ within VRI, MSRM	vri	2002 Update
Ownership	Ownership, Ministry of Forests	town_ar	2002 Update
Woodlots	Included in ownership coverage, Ministry of Forests	Included in town_ar	2002 Update
Protected Area Strategy goal 1	Included in ownership coverage, Ministry of Forests	Included in town_ar	2002 Update
Protected Area Strategy goal 2	PAS Goal 2, Ministry of Forests	tpas2_ar	2002 Update
Landscape units	Ministry of Forests	theeb_ar	2002 Update
<b>Base Inventories</b>			
Forest cover data	VRI (including disturbance update) and associated attribute tables, MSRM	vri	Aug 2003
Ecosystem inventory	IFPA Predictive Ecosystem Mapping (PEM) Project, JMJ Holdings	pem	Aug 2003
<b>Operability and Harvest Planning</b>			
TSR 2 operability	Original operability line used for TSR 2	ts_ter	1999 Technical
Updated operability	Updated through IFPA to reflect issues discussed in the AAC Rationale - AFLG revisions, removal of total chance blocking, Ministry of Forests	topr_ar	2002 Update



## 2. Definition of the timber harvesting land base

Table 3.1 Timber harvesting land base determination

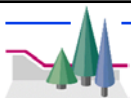
Land Classification	Total Land Base		Eligible Area
	Area (ha)	Volume (m <sup>3</sup> )	Area (ha)
<b>Total Area</b>	826,847		
Not administered by MoF	221,207		
<b>Total TSA</b>	605,640		
Non-forest	62,042		
Non-productive forest	50,331		
<b>Productive Forest</b>	493,267	89,457,488	
Inoperable	204,000	30,722,123	204,000
<b>Operable Forest</b>	289,267	58,735,365	289,267
Low productivity	2,752	3,014,961	111,052
Unmerchantable	7,211	4,498	47,118
Deciduous	7,676	868,574	17,813
Environmentally sensitive – outside watersheds	20,142	4,010,708	85,186
Environmentally sensitive – inside watersheds	6,064	1,460,338	16,985
Riparian	10,956	2,811,752	19,101
Identified wildlife	48	9,761	52
Protected areas strategy	358	101,733	1,295
OGMA	13,804	3,902,392	54,080
Wildlife tree patches	807	193,749	1,082
Dewdney trail	94	17,452	251
Existing roads	4,732	635,419	6,276
Landings	1,193	751	1,703
Timber licences	1,189	254,241	1,747
<b>Total Reductions</b>	77,026	17,286,329	
<b>Current Timber Harvesting Land Base</b>	212,241	41,449,035	
Plus timber licences	1,189		
Less future roads	12,888		
<b>Future Timber Harvesting Land Base</b>	200,542		



### 3. Classification of land base into management zones and growth & yield classes (analysis units)

#### Resource management zones

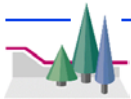
Zone	Area (ha)
Integrated resource management	212,241
Enhanced resource development zones	36,052
Connectivity corridors	67,475
Caribou habitat	14,022
Ungulate winter range	21,835
Visual quality objectives	86,326
Watersheds	103,531
Biodiversity mature seral reserve	40,138



### 3. Classification of land base into management zones and growth & yield classes (analysis units)

#### VDYP analysis unit inputs

Analysis Unit	Description	Net Area	Avg SI 50	Avg CC	Species Composition							
					Fd	Lw	Pl	Hw	Se	At	Bl	Cw
1	ICHdw 01a Fd	13,021	17.2	49	Fd	72	Lw	13	Pl	12	At	3
2	ICHmw2 04 Fd	8,661	17.6	59	Fd	65	Lw	14	Hw	13	Pl	8
3	ICHmw2 01 Fd	16,537	17.0	50	Fd	46	Se	28	Lw	15	Pl	11
4	ICHmw2 01 Lw	12,072	18.2	56	Lw	66	Pl	15	Fd	12	Se	7
5	ICHmw2 03 Fd	11,926	17.3	51	Fd	72	Lw	11	Pl	10	Hw	7
6	ICHmw2 04 Hw	5,550	15.3	57	Hw	64	Cw	16	Fd	15	Bl	5
7	ICHmw2 01 Hw	6,034	15.9	53	Hw	64	Cw	19	Fd	11	Se	6
8	ICHmw2 01 Pl	10,878	17.1	55	Pl	74	Lw	13	Fd	9	Se	4
9	ICHdw 01b Fd	6,950	17.8	52	Fd	69	Lw	16	Pl	11	Cw	4
10	ICHdw 01b Lw	5,842	19.1	57	Lw	64	Fd	18	Pl	14	At	4
11	ESSFwc4 02 Bl	1,242	12.0	49	Bl	68	Se	23	Pl	4	Hw	5



## 4. Development and provision of timber growth & yield information

### Site index estimate application

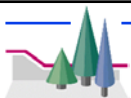
Age Range (Years)		0 - 20 Douglas-fir and Spruce, 0 - 10 All Others	21/11 - 140	141 +
Existing	Model	Managed (TIPSY)	Natural (VDYP)	Natural (VDYP)
	Site Index	SIBEC	VRI Site Index	VRI Site Index
Future	Model	Managed (TIPSY)	Managed (TIPSY)	Managed (TIPSY)
	Site Index	SIBEC	(Undetermined)	SIBEC

### Aggregate volume check

	Polygon Volume Derived Using		Percent Difference
	Inventory Volume	Yield Table Volume	
THLB Volume (m <sup>3</sup> )	41,449,035	42,201,250	1.8%

### Utilization levels

Leading Species	Minimum dbh (cm)	Maximum stump height (cm)	Minimum top dib (cm)
Pine	12.5	30.0	10.0
All others	17.5	30.0	10.0

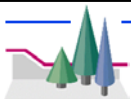


## 4. Development and provision of timber growth & yield information

### TIPSY regeneration composition inputs

Analysis Unit	Description	Regeneration Species Composition	Average Site Index (m)	Average Genetic Gain (%)
<b>Future Managed</b>				
201	ICHdw 01a Fd	Lw 30 Fd 30 Pl 20 Pw 15 Pw 3 Cw 2	18.1	15.3
202	ICHmw2 04 Fd	Pl 40 Sx 40 Lw 20	18.6	9.0
203	ICHmw2 01 Fd	Fd 33 Lw 33 Pl 33	19.3	11.4
204	ICHmw2 01 Lw	Fd 33 Lw 33 Pl 33	19.4	11.9
205	ICHmw2 03 Fd	Fd 33 Lw 33 Pl 33	18.3	12.8
206	ICHmw2 04 Hw	Pl 40 Sx 40 Lw 20	16.7	8.4
207	ICHmw2 01 Hw	Fd 33 Lw 33 Pl 33	17.4	13.8
208	ICHmw2 01 Pl	Fd 33 Lw 33 Pl 33	18.0	11.3
209	ICHdw 01b Fd	Lw 40 Fd 35 Pl 10 Py 8 Pw 4 Cw 3	18.9	15.3
210	ICHdw 01b Lw	Lw 40 Fd 35 Pl 10 Py 8 Pw 4 Cw 3	19.8	15.4
211	ESSFwc4 02 Bl	Sx 90 Pl 10	14.0	17.1

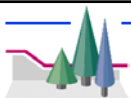
- Initial density - based on current stocking objectives (1400 stems/ha);
- Regeneration method (planting);
- Area-weighted average site index (with SIBEC);
- Area-weighted genetic gains;
- Operational adjustment factors (OAF1 = 15%, OAF2 = 5%); and
- No regeneration delay (delays are incorporated in forest level modelling).



## 5. Forest protection and salvage

### Unsalvaged losses

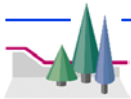
Cause of loss	Annual Unsalvaged Loss (cubic metres)
Mountain pine bark beetle	14,200
Douglas-fir bark beetle	500
Disease (years 1-94)	5,720
Disease (years 95+)	0
Wildfire	5,800
Windthrow/blowdown	2,500
<b>Total (years 1-94)</b>	<b>28,720</b>
<b>Total (years 95+)</b>	<b>23,000</b>



## 6. Resource management emphasis

### Resource emphasis zone forest cover requirements

Zone	Disturbance Limits		Retention Requirements		Application Land Base
	Min Ht (m)	Max %	Min Age	Min %	
<b>Integrated Resource Management (IRM)</b>	2.5	25			Timber harvesting land base
<b>Enhanced Resource Development Zone (ERDZ)</b>	0				Timber harvesting land base
<b>Connectivity corridors</b>	Application of landscape biodiversity requirements				Corridor land base with < 80% slope
<b>Caribou</b>					Productive forest less parks and protected areas, < 80% slope
ESSF below Caribou line	2.5	25	140	30	
ICH below Caribou line	2.5	25	140	40	
<b>Ungulate winter range</b>	2.5	25	100	40	Operable
<b>Visual quality objectives</b>					
VQO-retention	5.5	5			Crown forest
VQO-partial retention	5.5	15			Crown forest
VQO-modification	5.5	25			Crown forest
<b>Watersheds</b>					
Class 1 domestic	6	15			Crown forest
Class 2 domestic	6	20			Crown forest
Class 3 domestic	6	25			Crown forest
Community watersheds (default value)	6	25			Crown forest



## 6. Resource management emphasis

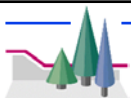
BEC/NDT seral stage requirements (minimum percent)

Emphasis	NDT	Mature + Old			Old		
		ESSF	ICH	IDF	ESSF	ICH	IDF
Low	1	19	17		19 <sup>(1)</sup>	13 <sup>(1)</sup>	
	2	14	15		9 <sup>(1)</sup>	9 <sup>(1)</sup>	
	3	14	14		14 <sup>(1)</sup>	14 <sup>(1)</sup>	
	4		17	17		13 <sup>(1)</sup>	13 <sup>(1)</sup>
Intermediate	1	36	34		19	13	
	2	28	31		9	9	
	3	23	23		14	14	
	4		34	34		13	13
High	1	54	51		28	19	
	2	42	46		13	13	
	3	34	34		21	21	
	4		51	51		19	19

<sup>(1)</sup>Full biodiversity requirements in low will be met in stages over three 70-year rotations

BEC/NDT seral stage requirements (minimum age)

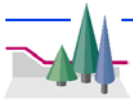
NDT	Mature + Old			Old		
	ESSF	ICH	IDF	ESSF	ICH	IDF
1	120	100		250	250	
2	120	100		250	250	
3	120	100		140	140	
4		100	100		250	250



## 7. Timber supply analysis methods, including model choice and management scenarios

Describe analysis elements such as:

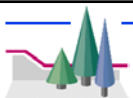
- harvest system
- initial harvest rate
- harvest rules
- disturbance of inoperable land base
- timber supply model description



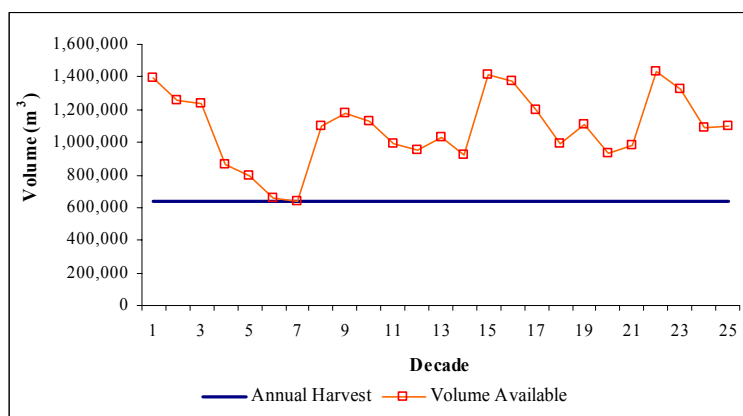
## 7. Timber supply analysis methods, including model choice and management scenarios

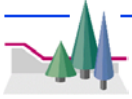
### Sensitivity analyses

Issue	Sensitivity Levels to be Tested
Harvest flow	Establish a non-declining even flow (NDEF) Highest initial harvest level
Land base	Adjust timber harvesting land base by +/- 10%
Growth and yield	Adjust existing stand yields by +/- 10% Adjust managed stand yields by +/- 10%
Visual landscape	Adjust denudation percentages +/- 5%
Green-up	Adjust green-up ages +/- 5 years
Minimum harvest ages	Adjust minimum harvest ages +/- 10 years
Slocan valley	Removed using contentious area definition Removed using contentious five landscape unit definition Full inclusion without harvest limitations Partial retention based on basal area retention guidelines
SIBEC	Site index assigned based on first PEM decile only Over and underestimation in SIBEC
Disturbance of Inoperable areas	Do not disturb areas outside of the THLB
Landscape biodiversity	Apply seral requirements in place of OGMAs




## Preliminary Basecase





## Key messages of the session

- Analysis results are only as good as the information that goes in (Garbage in  Garbage out).
- DFAM is part of TSR and therefore is about what is, not what could be (current performance rules here).
- It is the licensee's responsibility to know the issues and how they are being dealt with on the ground.
- The outcome of the TSR process is a decision, not calculation, because non-quantifiable factors and risks are weighed into the final AAC number.