

# Prince Albert FMA

## Sensitivities

Prince Albert Forest Management Area (FMA)  
Sakâw Askiy Management Inc.

# Sensitivities

- (01) Prov. Utilization
- (02) Higher Pulp
- (03) Volume +/-10%
- (04) +10 year MHA
- (05) +/- Regen Time
- (06) Exclusion of High Pulp Stands
- (07) Less inBlock Retention
- (08) SWD Regen Reduction
- (09) SWD Regen Increase
- (10) CL vs. CTL Utilization

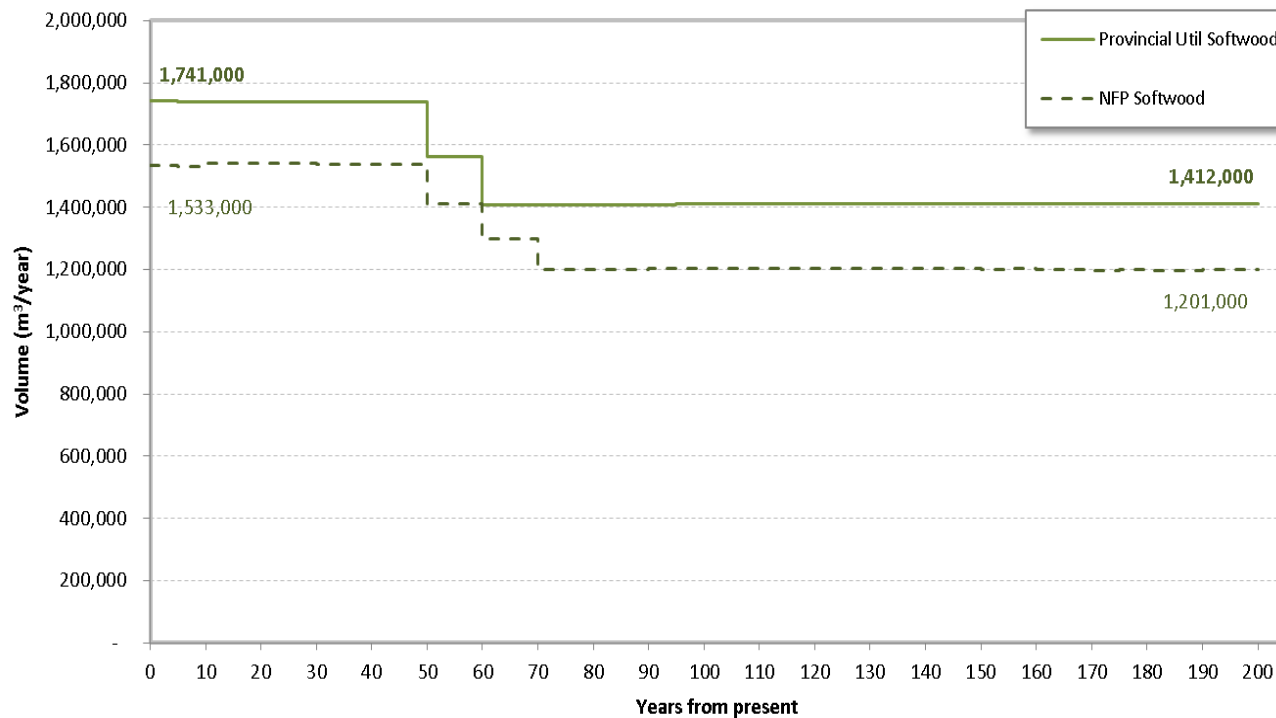
# (01) Provincial Utilization Standards

- The first sensitivity analysis was to determine the harvest flow differences arising from using the 2008 provincial Utilization standards. Yield Group stratification is slightly different for the provincial utilization standards.

Variable	Base Case	Provincial Utilization
Stump Height	30cm	30cm
Top dib	8cm	5cm
Tamarack	Included	<ul style="list-style-type: none"><li>1 Scenario with TL</li><li>1 Scenario without TL</li></ul>
MHA (calculated)	Yes	Yes

# (01) Provincial Utilization Standards

- With/without TL volumes makes negligible difference (always <10% of stands). 14% impact in short term, 17% long term



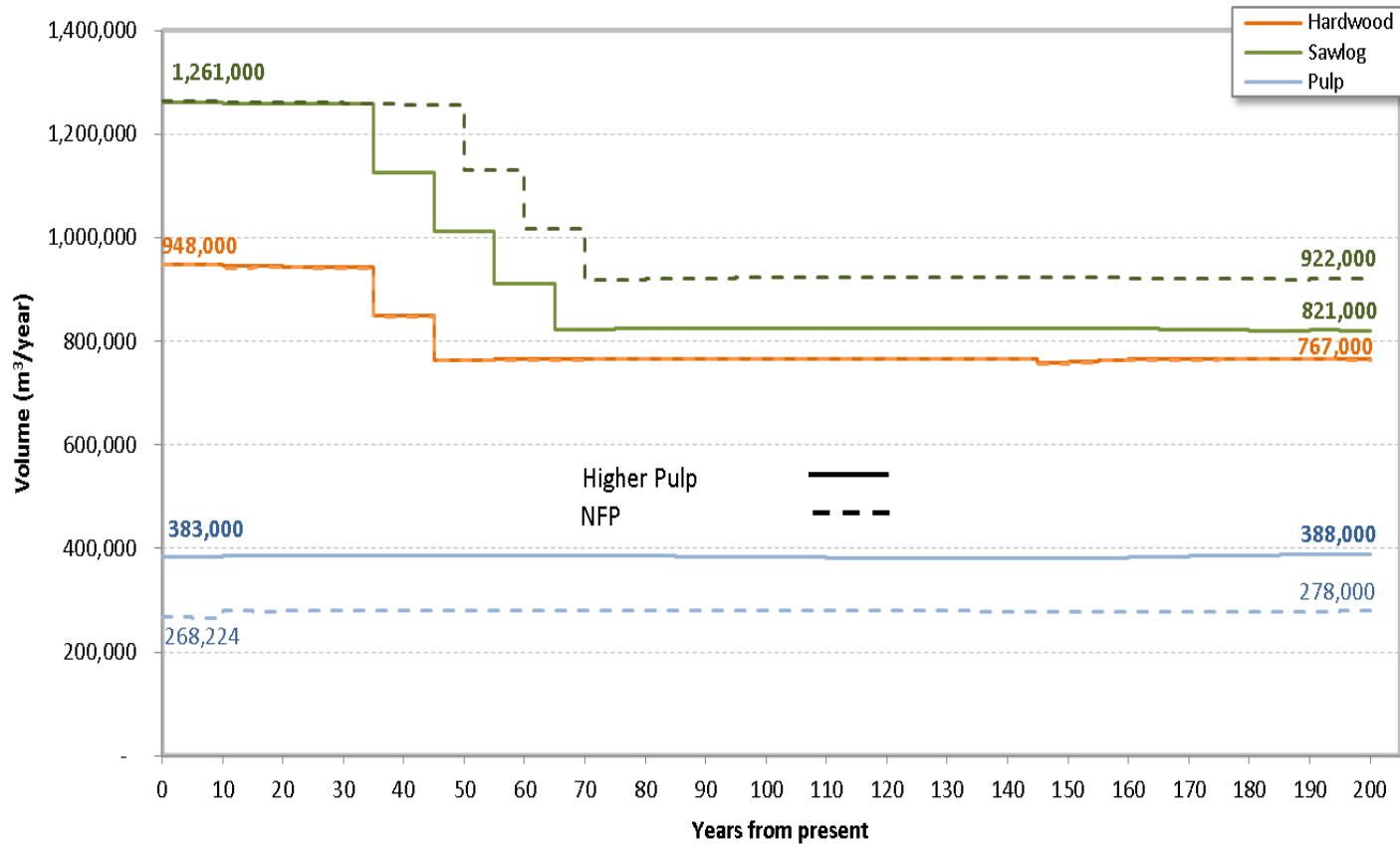
## (02) Higher Pulp Proportions

- A variable percentage of small sawlog volume was transferred to pulp.
- Based on the Weyerhaeuser 1999 FMP (downgrade factors).

Yield Group	Description	Age	Current % Pulp	Sawlog Downgrade Target	Adjusted Pulp %	Difference	% Difference
1	1_H_HW_B_Density	100	7%	15%	15%	8%	127%
2	1_H_HW_CD_Density	100	13%	15%	15%	2%	19%
3	2_HS_HjP_B_Density	100	11%	35%	35%	24%	208%
4	2_HS_HjP_CD_Density	100	25%	35%	35%	10%	41%
5	3_SH_jPH_B_Density	100	19%	35%	35%	16%	89%
6	3_SH_jPH_CD_Density	100	25%	35%	35%	10%	42%
7	4_HS_HxS_B_Density	100	14%	15%	15%	1%	11%
8	4_HS_HxS_CD_Density	100	12%	15%	15%	3%	23%
9	5_SH_SxH_B_Density	100	13%	15%	15%	2%	17%
10	5_SH_SxH_CD_Density	100	13%	15%	15%	2%	17%
11	6_S_bS_1_Site	100	24%	20%	24%	0%	0%
12	6_S_bS_23_Site	100	18%	20%	20%	2%	8%
13	7_S_jP_12_Site	100	22%	35%	35%	13%	59%
14	7_S_jP_3_Site	100	23%	35%	35%	12%	53%
15	8_S_jPbS_12_Site	100	17%	25%	25%	8%	44%
16	8_S_jPbS_3_Site	100	20%	25%	25%	5%	23%
17	9_S_wSbF_1_FMZ	100	18%	15%	18%	0%	0%
18	9_S_wSbF_23_FMZ	100	10%	15%	15%	5%	49%



# (02) Higher Pulp Proportions



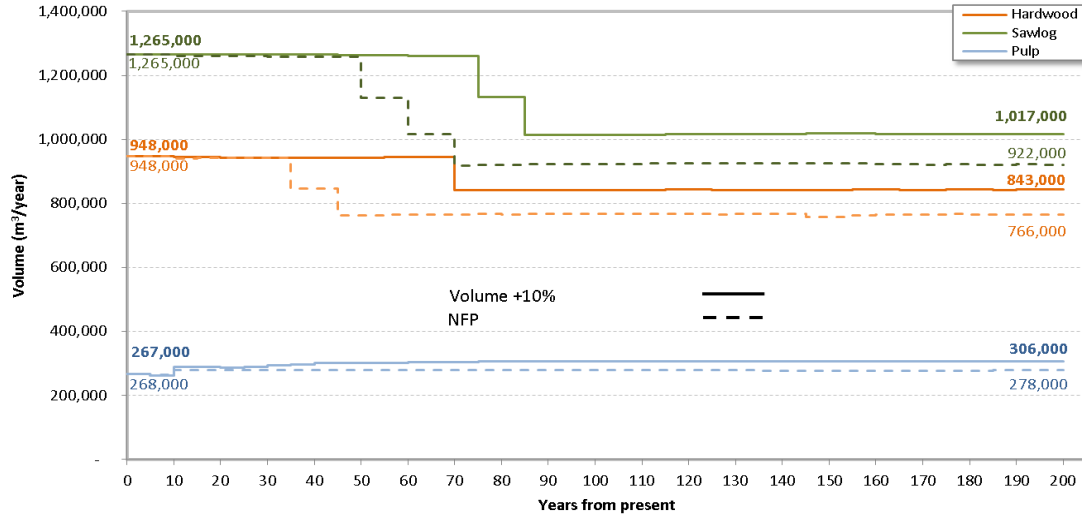
## (03) Volume +/- 10%

- Yield estimates are a crucial part of harvest forecasting.
- Accuracy is dependent on resource inventory, and fitting growth curves to temporary sample plots.
- This sensitivity analysis investigates the effect on harvest rates when the yield curves are estimated within a +/- 10% tolerance.

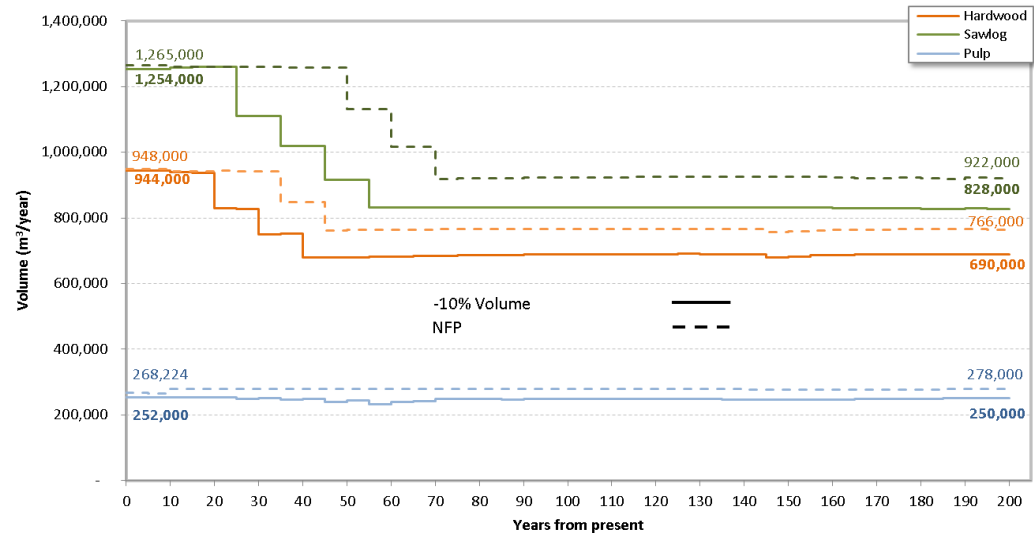


# (03) Volume +/- 10%

**+10%**



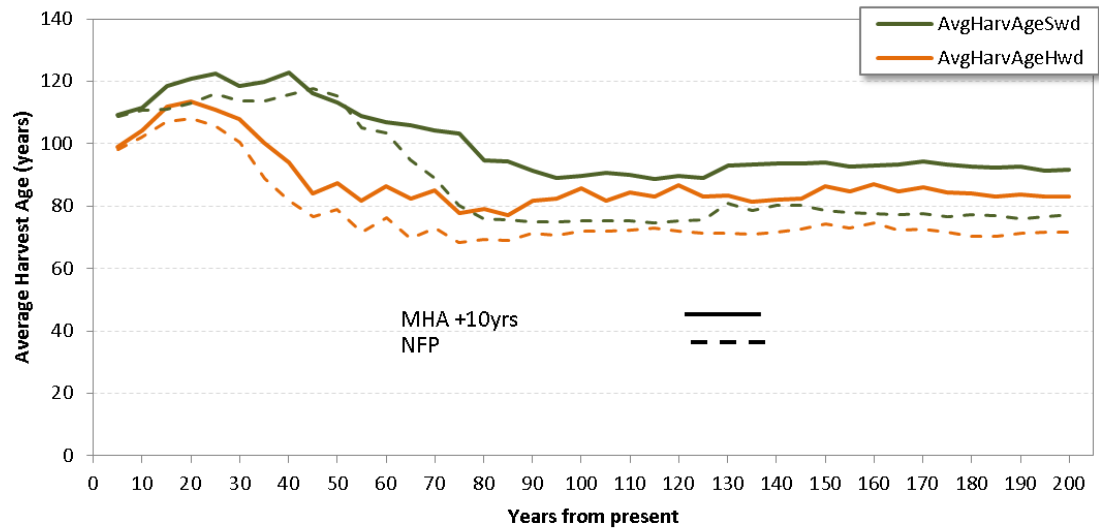
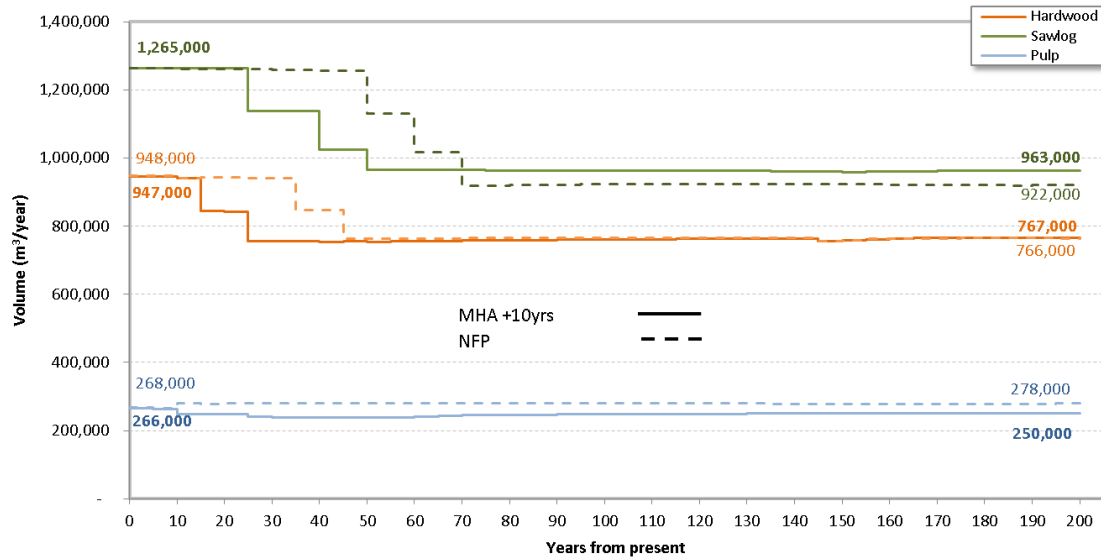
**-10%**



# (04) 10 Year Increase in MHAs

Yield Group	Description	Base MHA	Sens. MHA
1	H_HW_Density_B	45	55
2	H_HW_Density_CD	50	60
3	HS_HjP_Density_B	60	70
4	HS_HjP_Density_CD	65	75
5	SH_jPH_Density_B	60	70
6	SH_jPH_Density_CD	65	75
7	HS_HxS_Density_B	75	85
8	HS_HxS_Density_CD	80	90
9	SH_SxH_Density_B	75	85
10	SH_SxH_Density_CD	80	90
11	S_bS_SiteModPoor	65	75
12	S_bS_SiteGood	65	75
13	S_jP_SitePoor	70	80
14	S_jP_SiteGoodMod	55	65
15	S_jPbS_SitePoor	80	90
16	S_jPbS_SiteGoodMod	60	70
17	S_wSbF_FMZ1	65	75
18	S_wSbF_FMZ23	65	75
19	S_tL_11to30pct	50	60

# (04) 10 Year Increase in MHAs



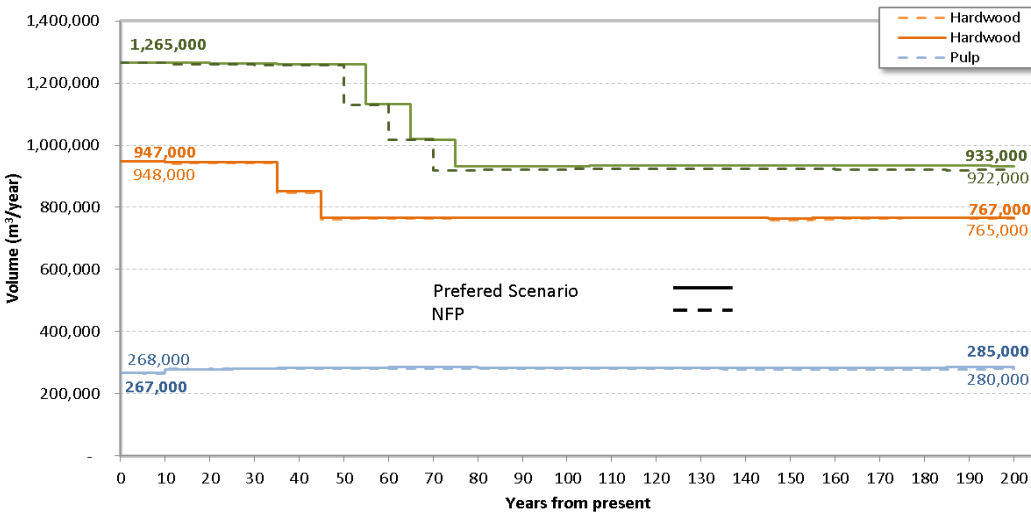
# (05) Decrease/ Increase in Regen Delays

- (a) increased by 1 year for hardwoods and 2 years for softwoods
- (b) decreased by 2 years for softwoods

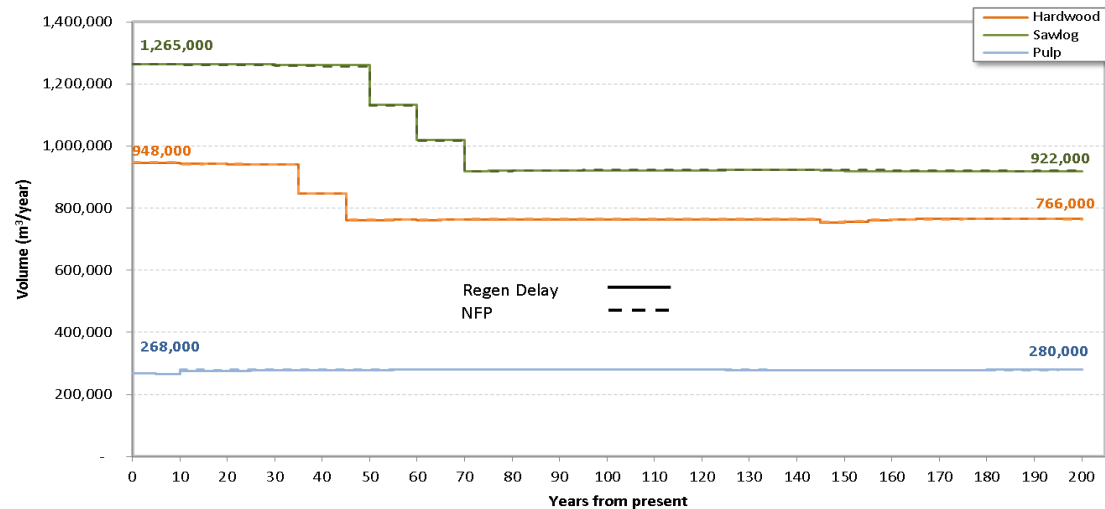
Yield Group	Dev Type	Base Regen	+ Regen delay	- Regen delay
1	HW	0	-1	0
2	HW	0	-1	0
3	HjP	0	-1	0
4	HjP	0	-1	0
5	jPH	-1	-3	1
6	jPH	-1	-3	1
7	HxS	0	-1	0
8	HxS	0	-1	0
9	xSH	0	-2	2
10	xSH	0	-2	2
11	bS	-1	-3	1
12	bS	-1	-3	1
13	jP	-1	-3	1
14	jP	-1	-3	1
15	jPbS	-1	-3	1
16	jPbS	-1	-3	1
17	wSbF	-1	-3	1
18	wSbF	-1	-3	1
19	tL	-1	-3	1

# (05) Decrease/Increase in Regen Delays

## Decrease



## Increase



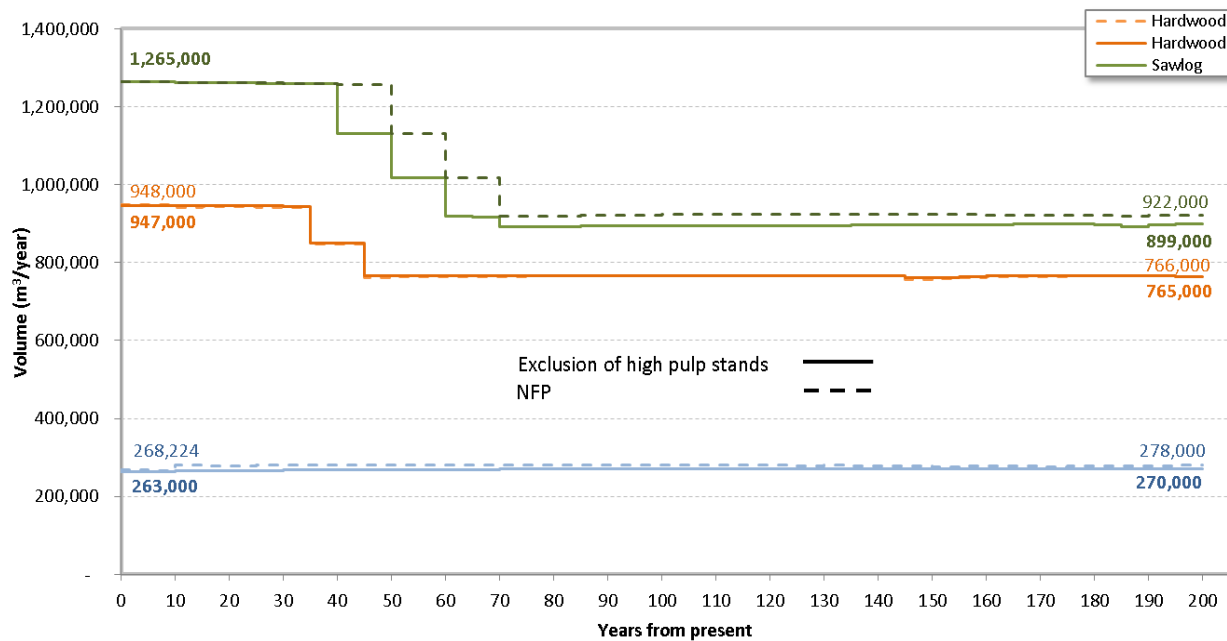
# (06) Exclusion of High Pulp Stands

Indicator	Criteria
Forest Type	JLP, BSJ, BSL
Site Class	3,4 (Low)
Density	C, D (High)
Height	any

- This results in ~127,900 ha of excluded stands (represents a crude estimate of extent of issue).
- ~10% impact to total net area.

# (06) Exclusion of High Pulp Stands

- Softwood harvest falls by 2.5% in long term (low volume stands)



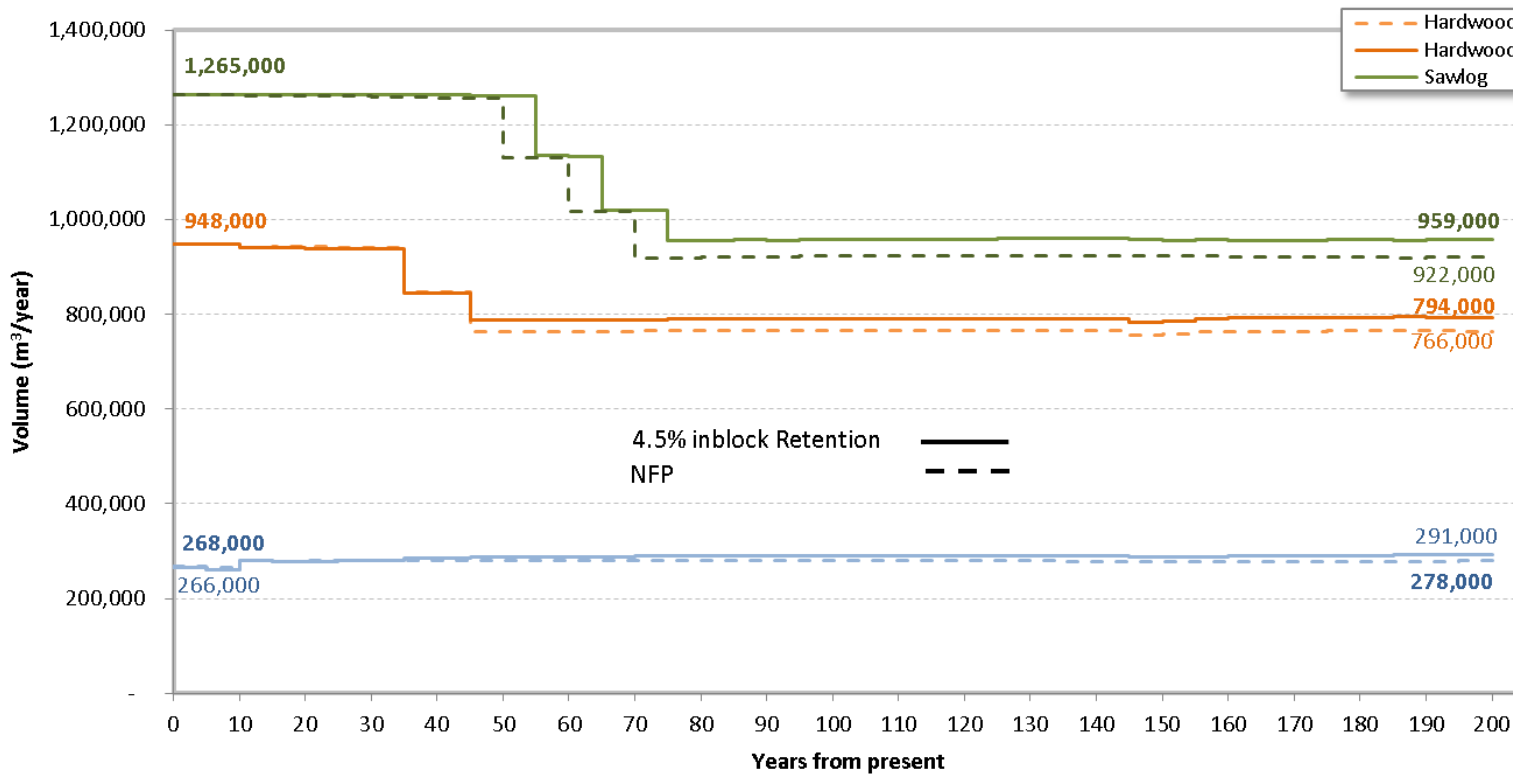
## (07) Lower In Block Retention

- The percentage of the in-block retention is set at 9% for the base case.
- A scenario where in block retention was reduced from 9% to 5% was investigated.



# (07) Lower In Block Retention

4.5% reduction in retention translates into a 4% harvest increase

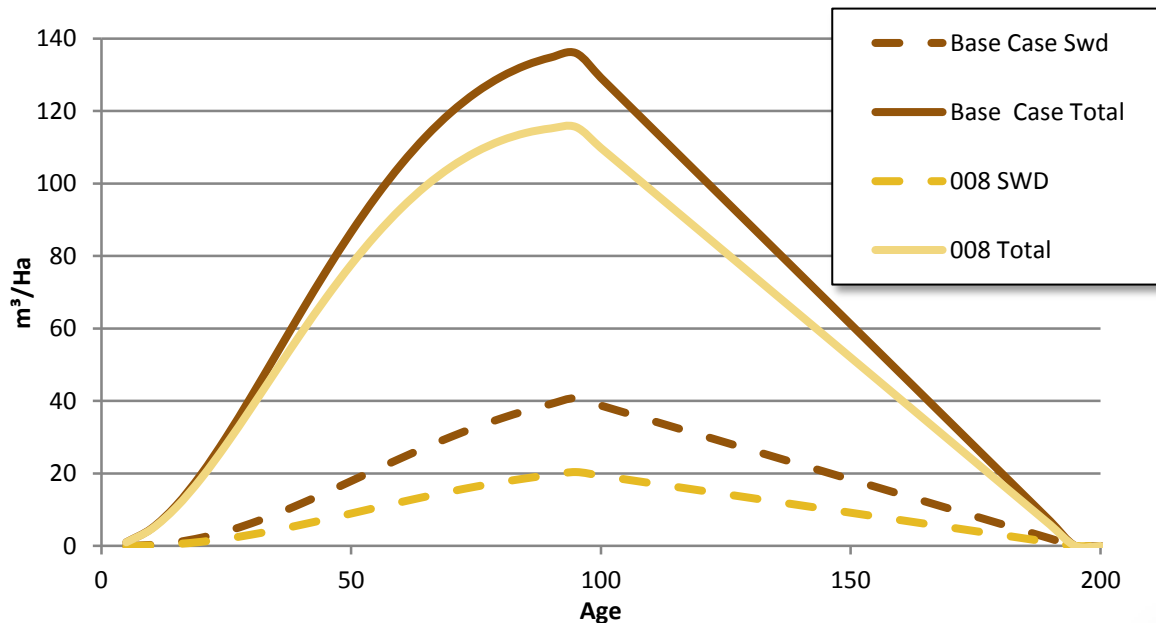


## (08) Softwood Regen Reduction

- If we have a decrease in softwood regen, we get an overall volume reduction – due to softwood being in the understory and not competing for the same resources as the hardwoods.

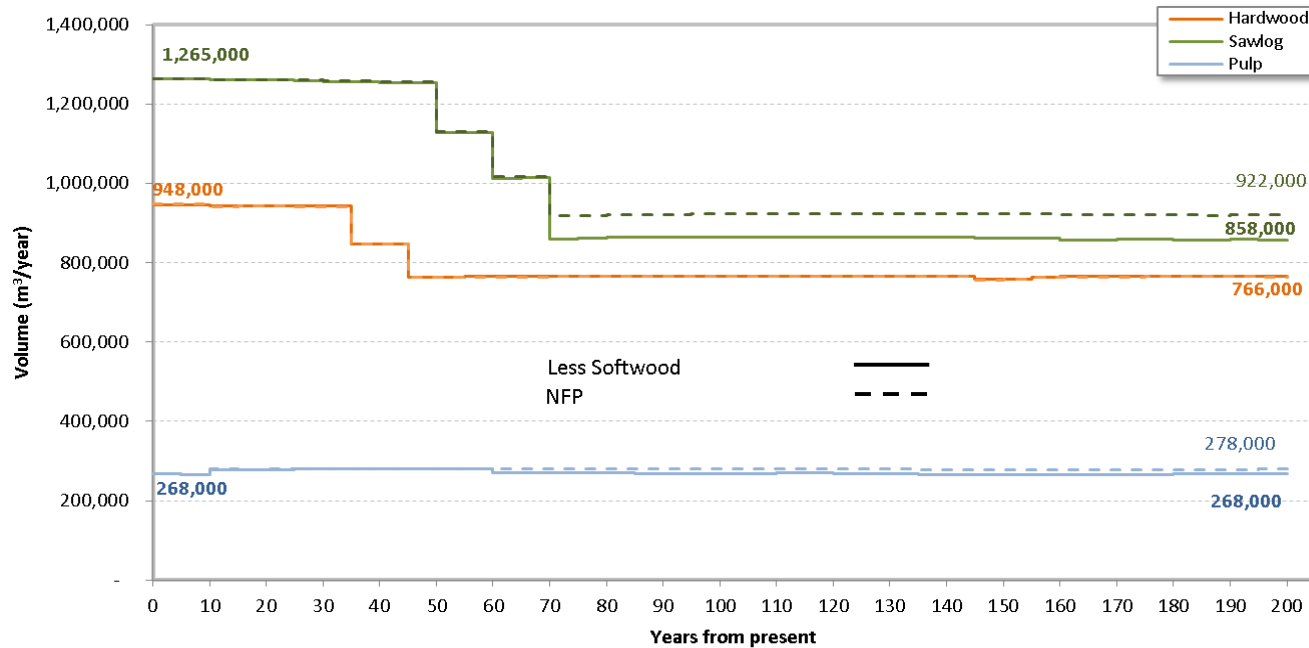
# (08) Softwood Regen Reduction

- In Hardwood stands, softwood volumes were reduced by 50 % for regenerated stands
- In Hardwood/Softwood mixed types, softwood volumes were reduced by 25%.



# (08) Softwood Regen Reduction

	Total	Area 50%	Area 25%	Area 0%
Area (Ha)	1,467,906	412,907	175,494	879,504
Percent	100%	28%	12%	60%

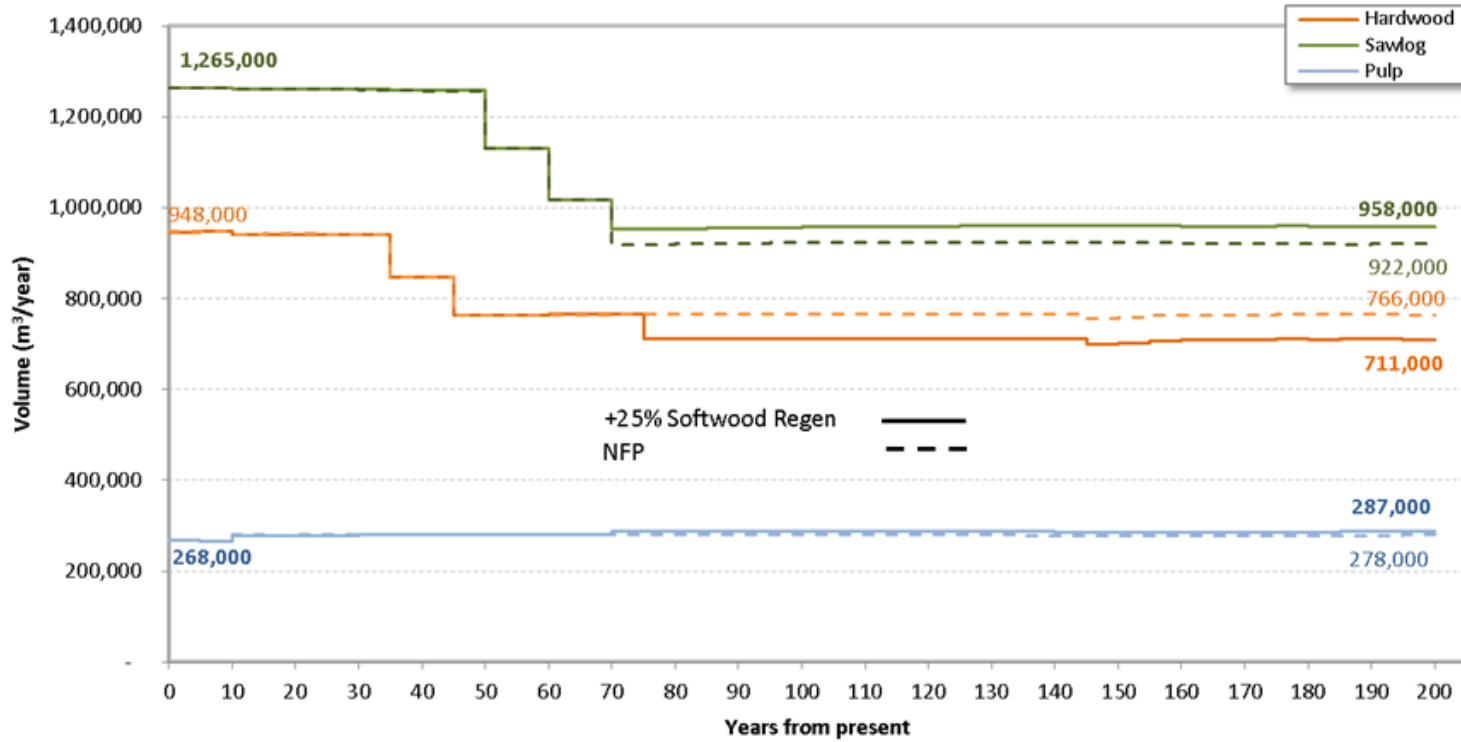


# (09) Shifting to SWD

- Increased Soft Wood Planting
- Increased Bushing Program
- No change in total volume

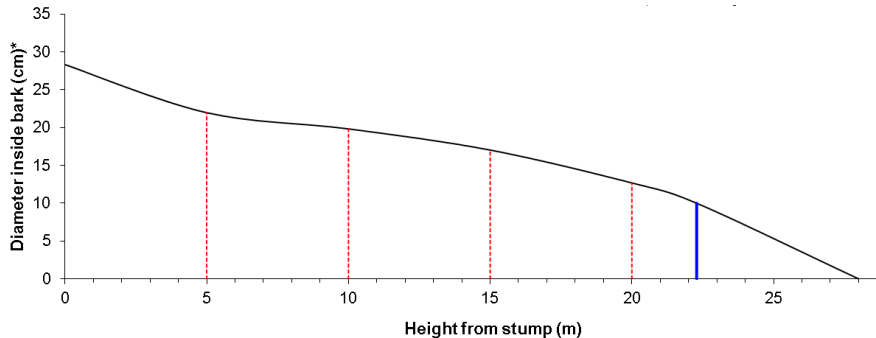
Std Type	Yield Group	MHA	Swd Netvol (m <sup>3</sup> /ha)	Hwd netvol (m <sup>3</sup> /ha)	Total netvol (m <sup>3</sup> /ha)	%Swd	%Hwd	%Shift	%Swd new	%Hwd new
HS	3	60	40.34	38.00	78.35	51%	49%	25%	77%	22%
HS	4	65	79.09	66.82	145.92	54%	46%	25%	68%	32%
SH	5	60	50.72	27.63	78.35	65%	35%	25%	89%	19%
SH	6	65	98.74	47.17	145.92	68%	32%	25%	85%	15%
HS	7	75	78.97	33.82	112.79	70%	30%	25%	87%	13%
HS	8	80	81.88	94.08	175.96	47%	53%	25%	58%	42%
SH	9	75	75.37	37.42	112.79	67%	33%	25%	84%	16%
SH	10	80	113.60	62.35	175.96	65%	35%	25%	80%	20%

# (09) Shifting to SWD



# (10) Tree Length to Cut-to-length

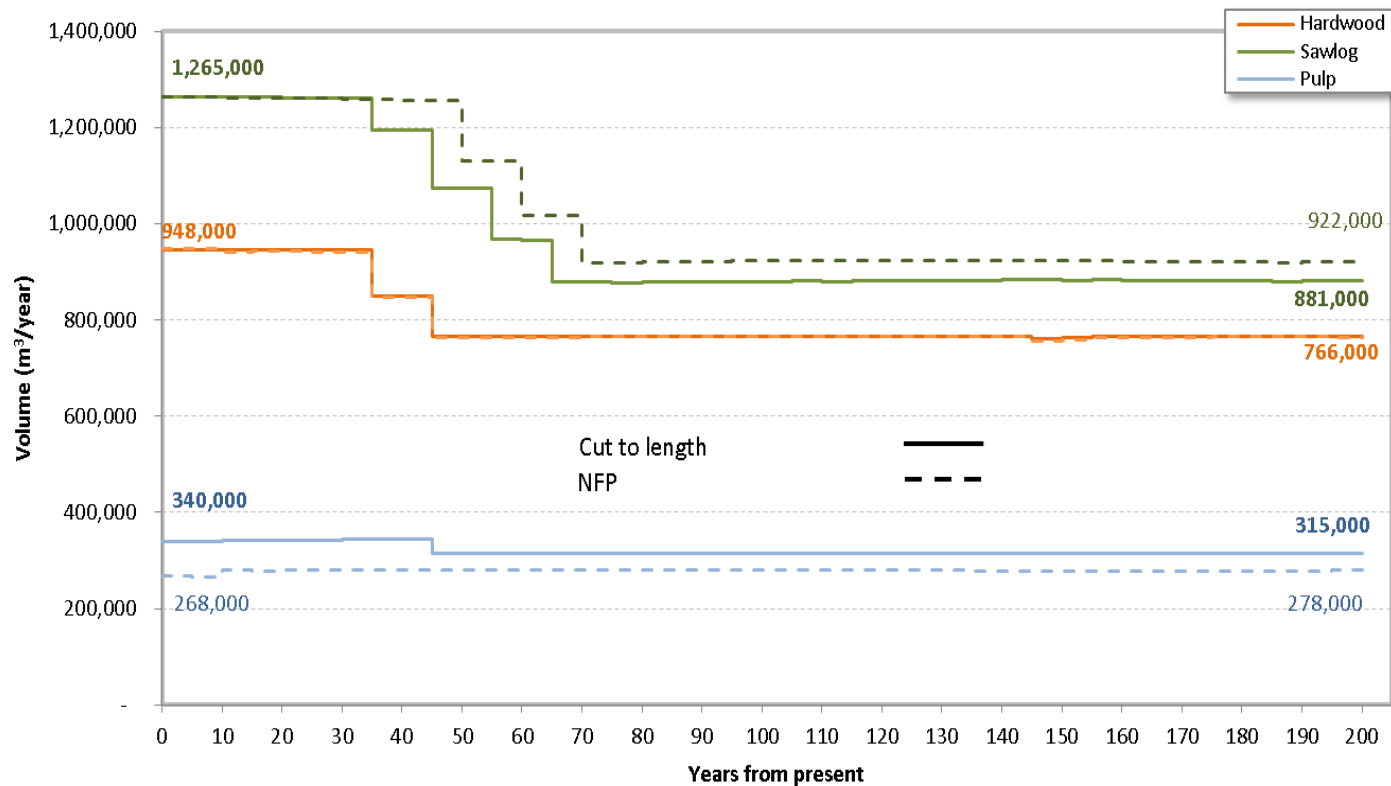
- Tree Length (TL) vs Cut to Length (CTL)
  - CTL can result in less merchantable volume as the penultimate log is discarded if too short
  - The more flexible the log bucking specs, the lower the waste %
  - The larger the trees are, the lower the waste%



- For simplicity, a 4.5% reduction was applied to softwood sawlogs (shifting volume to pulp). Represents an aggressive estimate of impact with totally strict log length rules.

# (10) Tree Length to Cut-to-length

- Softwood sawlog harvest fell by 4.5%, pulp increased.





Modeling Report to be complete next week and distributed for review by shareholders.