

Morice and Lakes Timber Supply Areas Innovative Forest Practices Agreement

Under-storey Sensitivities

Analysis and presentation by
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June 6th, 2008



Report for the Chief Forester

August 2006

*Abundance of Secondary Structure In
Lodgepole Pine Stands Affected by the
Mountain Pine Beetle*

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1. A pseudo inventory of under-storey secondary structure was created based on existing research.
2. Yield curves were built for the pseudo inventory under-storey.
3. The existing MPB depleted curves were retained.
4. The pseudo inventory volumes were added to the MPB depleted natural inventory curves.
5. The maximum volume level for the depleted-plus-under-storey curves was set.
6. Stands with pseudo inventory under-storey were deferred from harvest for 40 years.

Areas without under-storey secondary structure did not have their modeling assumptions adjusted.



Developing the Under-storey Sensitivity

STEP 1:

Create a pseudo inventory of under-storey secondary structure based on existing research.



Developing the Under-storey Sensitivity

STEP 2:

Build yield curves for the under-storey psuedo inventory



Developing the Under-storey Sensitivity

STEP 3:

Retain the existing MPB depleted
curves



Developing the Under-storey Sensitivity

STEP 4:

Add the pseudo under-storey
volumes to the MPB depleted
natural inventory volumes



Developing the Under-storey Sensitivity

STEP 5:

Set the maximum volume level for
depleted plus under-storey curves



Developing the Under-storey Sensitivity

STEP 6:

Defer stands with under-storey for 40
years



STEP 1: Create pseudo inventory:

Research estimates abundance of stands with sufficient (minimum of 5m²/ha basal area) under-storey secondary structure to potentially contribute to mid-term timber supply.

BEC variant	THLB Area (ha)	Estimated Abundance	Applicable Area (ha)
SBSdk	117,600	15%	17,640
SBSmc2	145,650	60%	87,390
Total	263,250	40%	105,030

* Random Selection *

STEP 2:

Build yield curves for the under-storey psuedo inventory

- Minimum 1000 stems per hectare
- Minimum 5m²/ha basal area at time zero
- Equivalence age of 30 was used
- Inventory Site Index

Had to use TIPSYP for these natural stands to control for density and basal area.

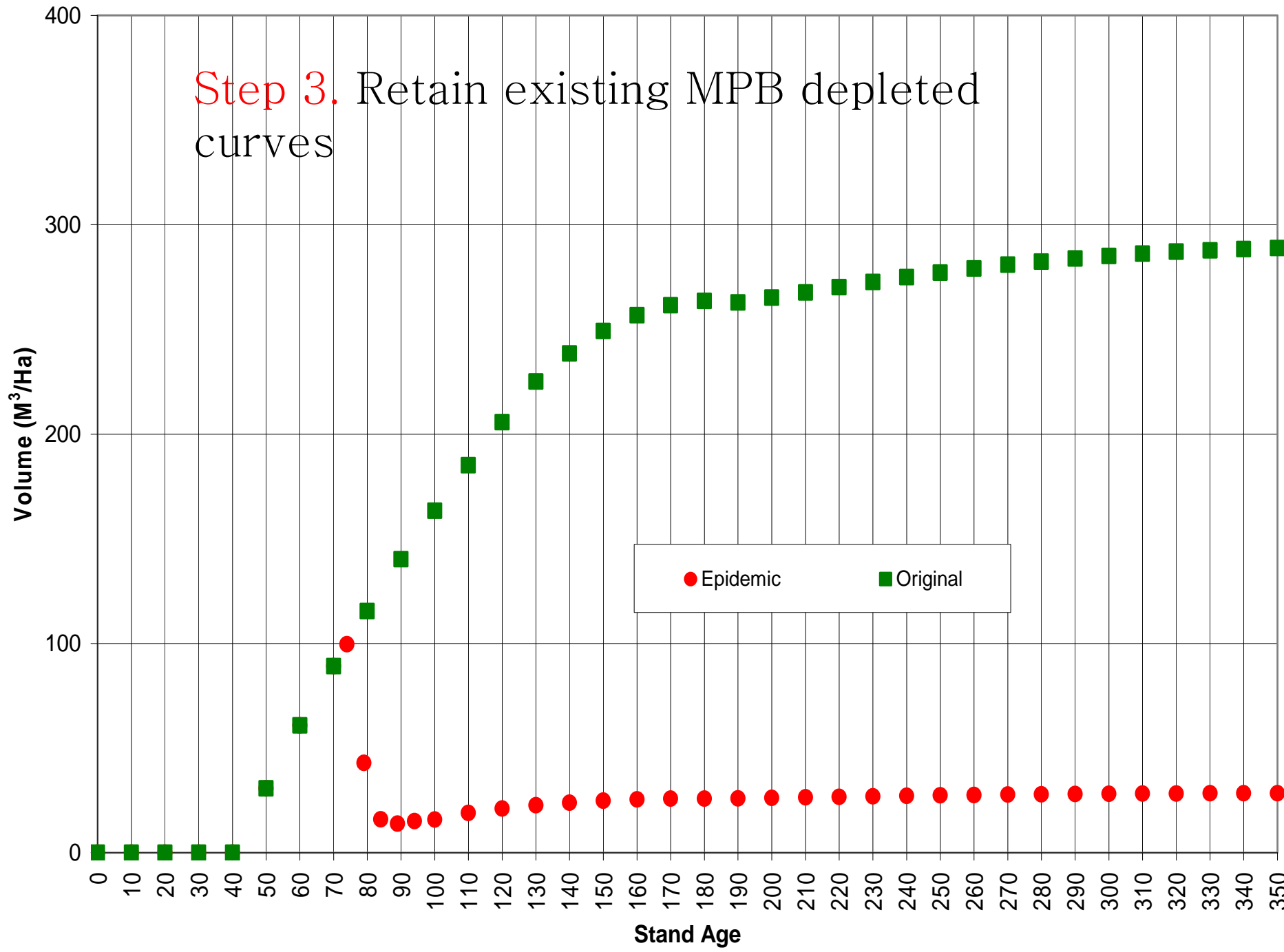
STEP 2:

Build yield curves for the under-storey psuedo inventory

- Species Composition from Same Research

Subzone	SBSdk	SBSmc2
Species	(%)	(%)
Pl	26.5	5.6
Sx	55.8	14.7
Bl	14.6	79.4
Sb	3.1	0.3
Total	100	100

Step 3. Retain existing MPB depleted curves



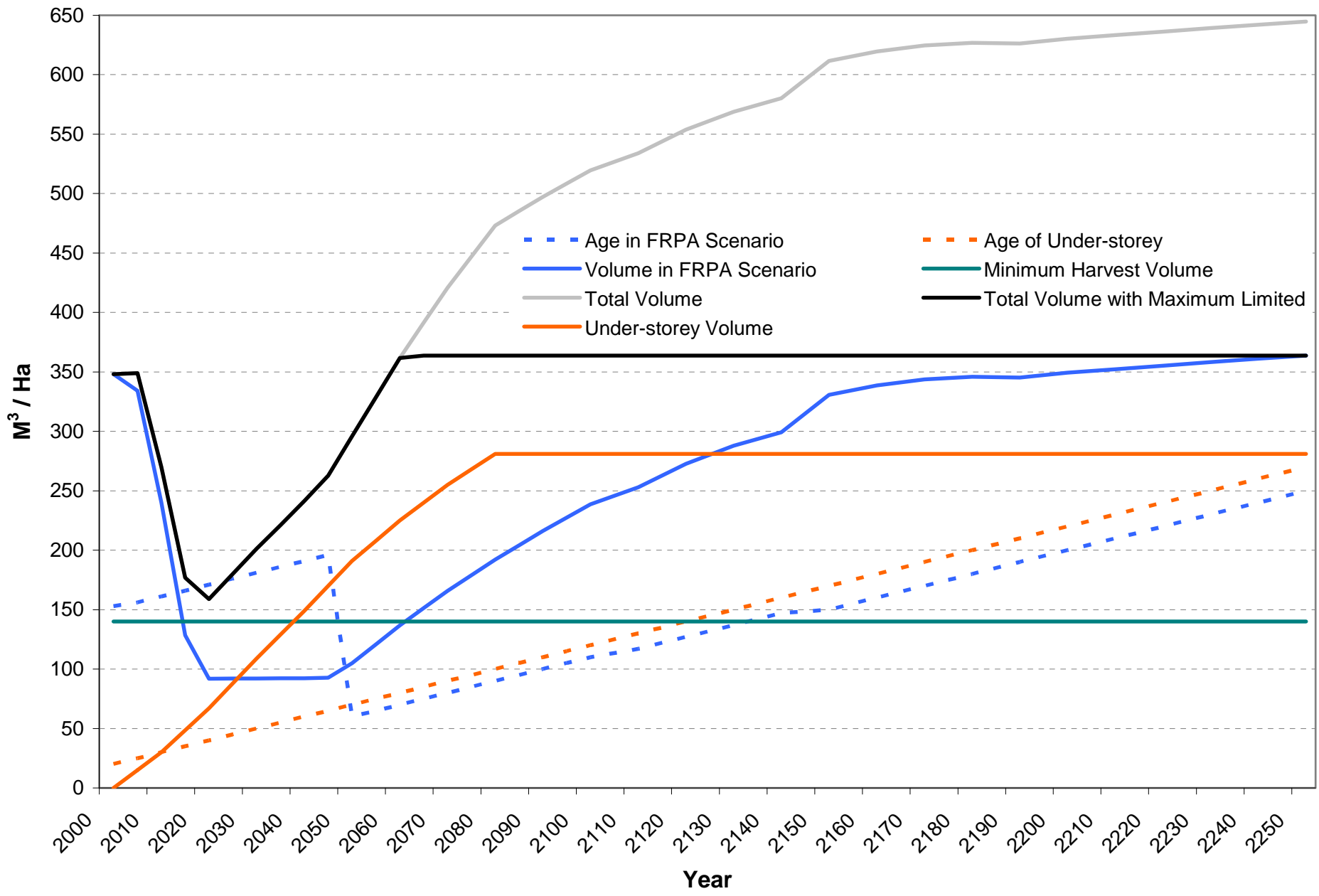
STEP 4:

Add the pseudo under-storey volumes to the MPB depleted natural inventory volumes

STEP 5:

Set the maximum volume level for depleted plus under-storey curves





Step 4 and Step 5

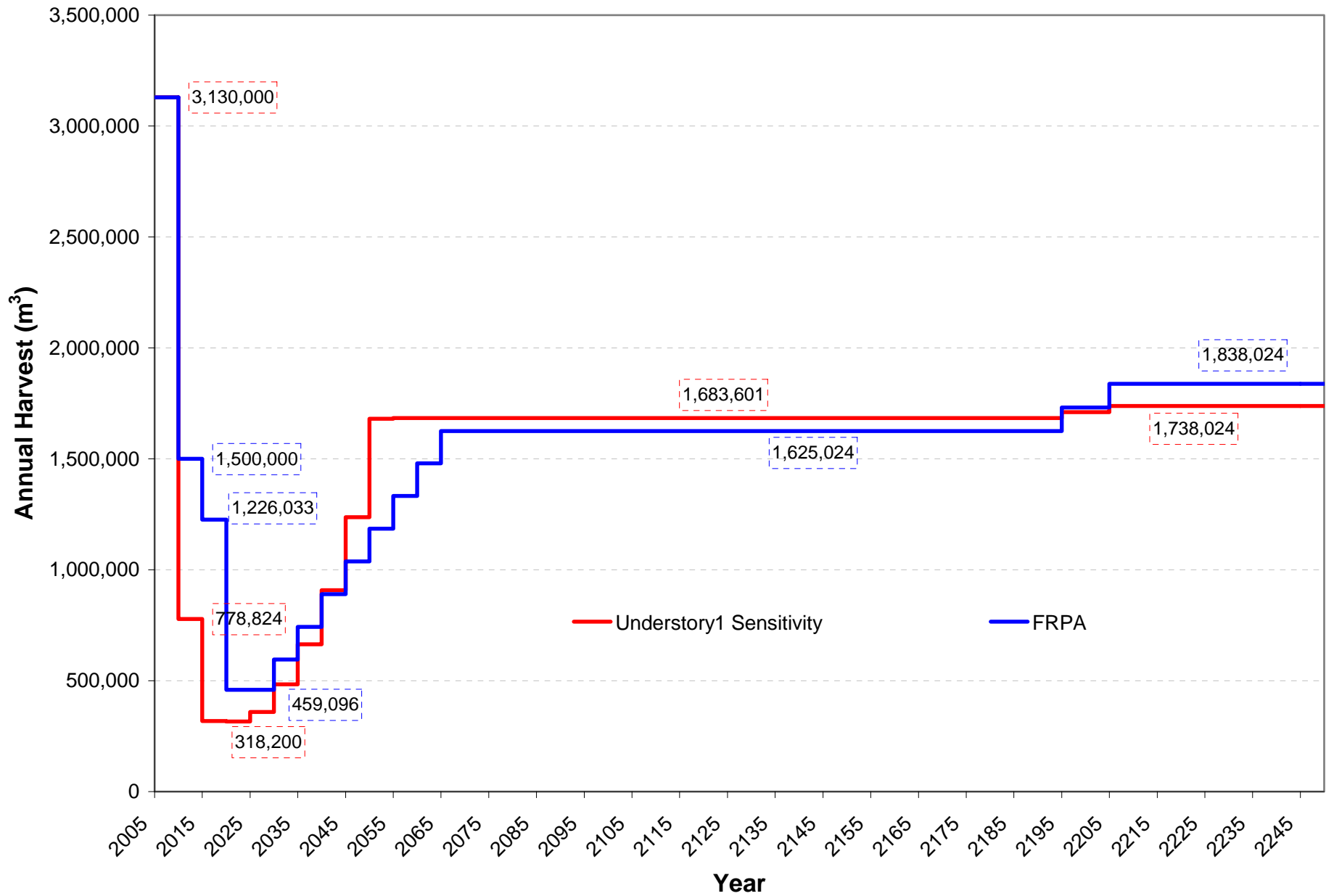
STEP 6: Defer stands with under-storey for 40 years

Allow under-storey trees to reach maturity

Our interpretation of the draft policy at that time

Next: RESULTS





IFPA Lakes TSA FRPA Implementation Scenario Understorey 1 Sensitivity Harvest Flow

Impacts of Deferral and Under-storey

20% of the THLB deferred for 40 years

Average short term harvest level was 443,000 m³/yr or 28% lower.

The lowest level occurs 5 years earlier, 316,000 m³/yr or 31% lower

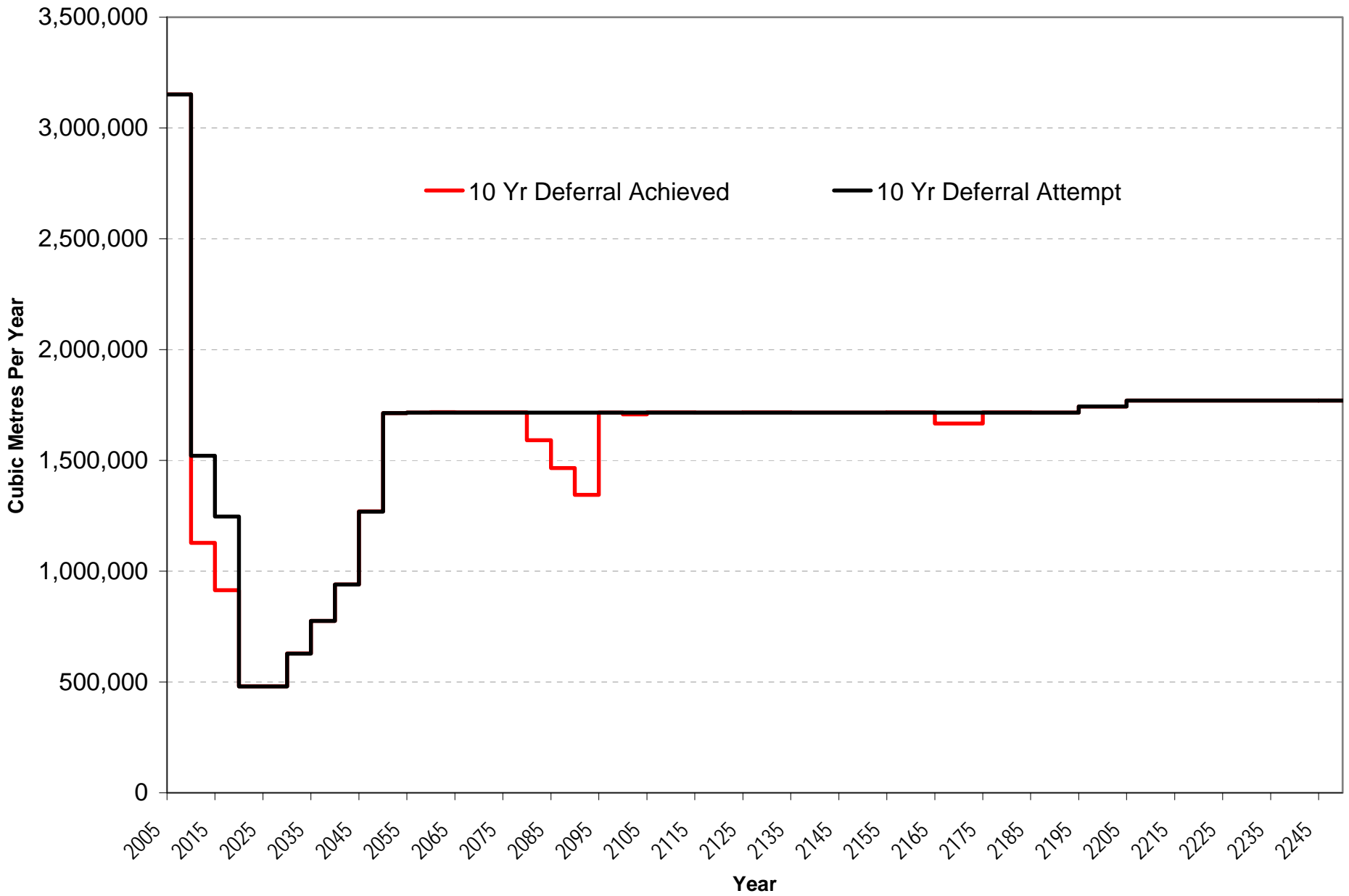
Mid term harvest level 7% higher

Long term harvest level on average almost identical

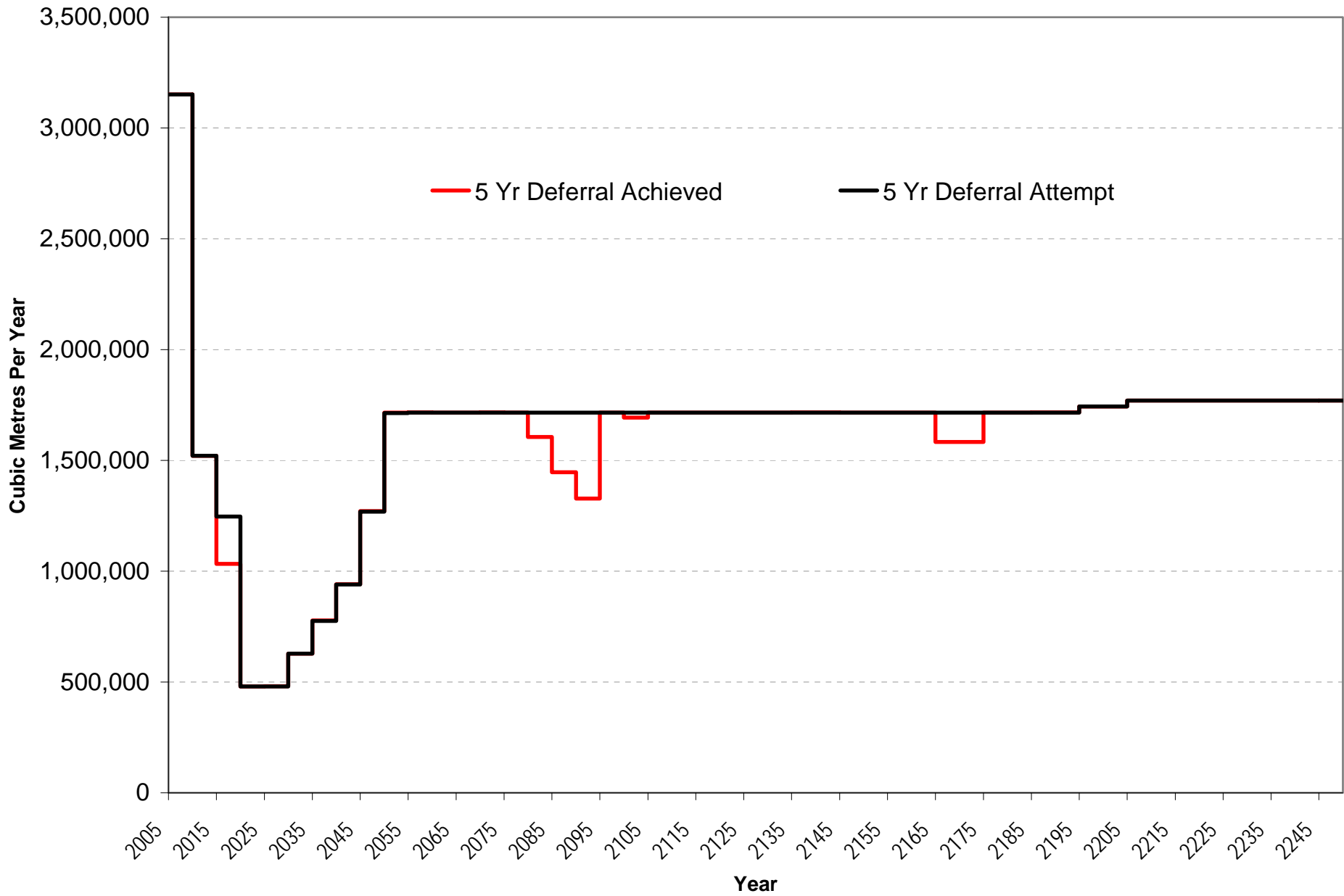
The short term impacts received some scrutiny and led to additional analysis and revised assumptions

Not the desired outcome from preserving secondary structure for mid term timber supply





Reduced Deferral: 10 years



Reduced Deferral: 5 years

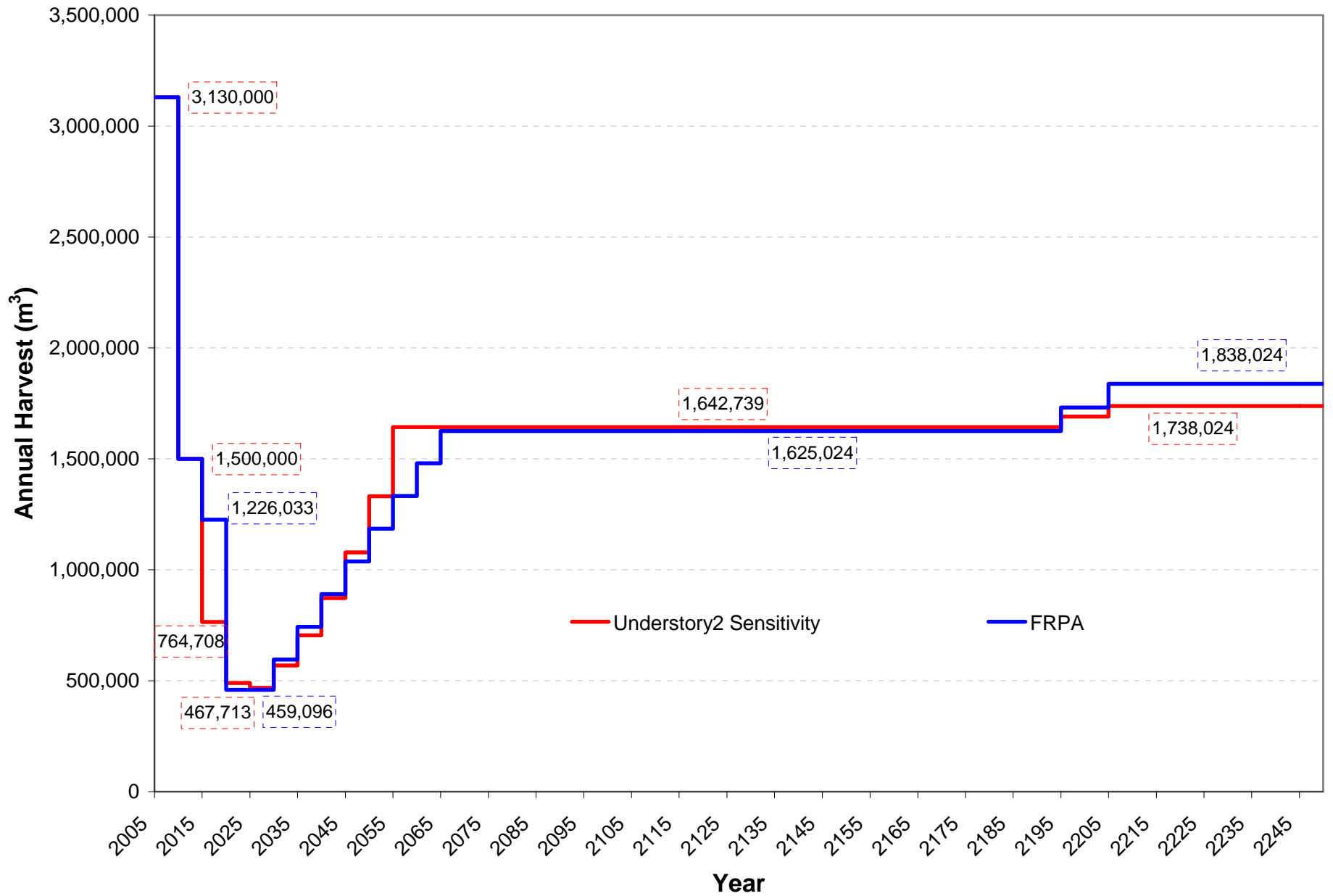
Subsequent Under-storey Sensitivity

The only difference is a reduction in the area subject to harvest deferral by 60%

Stands expected to have more than 200 m³ / ha of mature pine (including dead pine within its 5 year shelf life) in 2008 were removed from the deferral list,

Change in Deferred Area by Pine Component Class

Pine Component Class (%)	Under-storey Sensitivity 1 (Ha)	Under-storey Sensitivity 2 (Ha)
30	46	46
40	1,045	1,045
50	4,854	3,938
60	11,429	5,807
70	12,774	5,318
80	15,360	6,032
90	24,193	7,799
100	35,343	11,727
TOTAL	105,044	41,712



IFPA Lakes TSA FRPA Implementation Scenario Understorey 2 Sensitivity Harvest Flow

RESULTS Under-Storey Sensitivity 2

Period 3 (2013–2017) remains significantly lower

Short term average harvest level 108,000 m³/yr or 7% lower.

Minimum harvest level about 2% lower between 2023 and 2027.

Average mid-term harvest level was 3.5% or 45,000 m³/yr higher.

Average LTHL 1.5% lower



RESULTS DISCUSSION

Under-Storey Sensitivity 2

Stands removed from deferral

Under-storey stands with over 200 m³/ha of pine were eligible for harvest.

The model either utilized them early or they dropped below MHV for a time despite under-storey



RESULTS DISCUSSION

Under-Storey Sensitivity 2

Deferred Stands

Meanwhile the stands that were deferred in this sensitivity were those with less pine to begin with.

Of the under-storey stands they were generally the least likely to drop below MHV in period 3.

Because they are deferred the model cannot find sufficient volume in period 3.



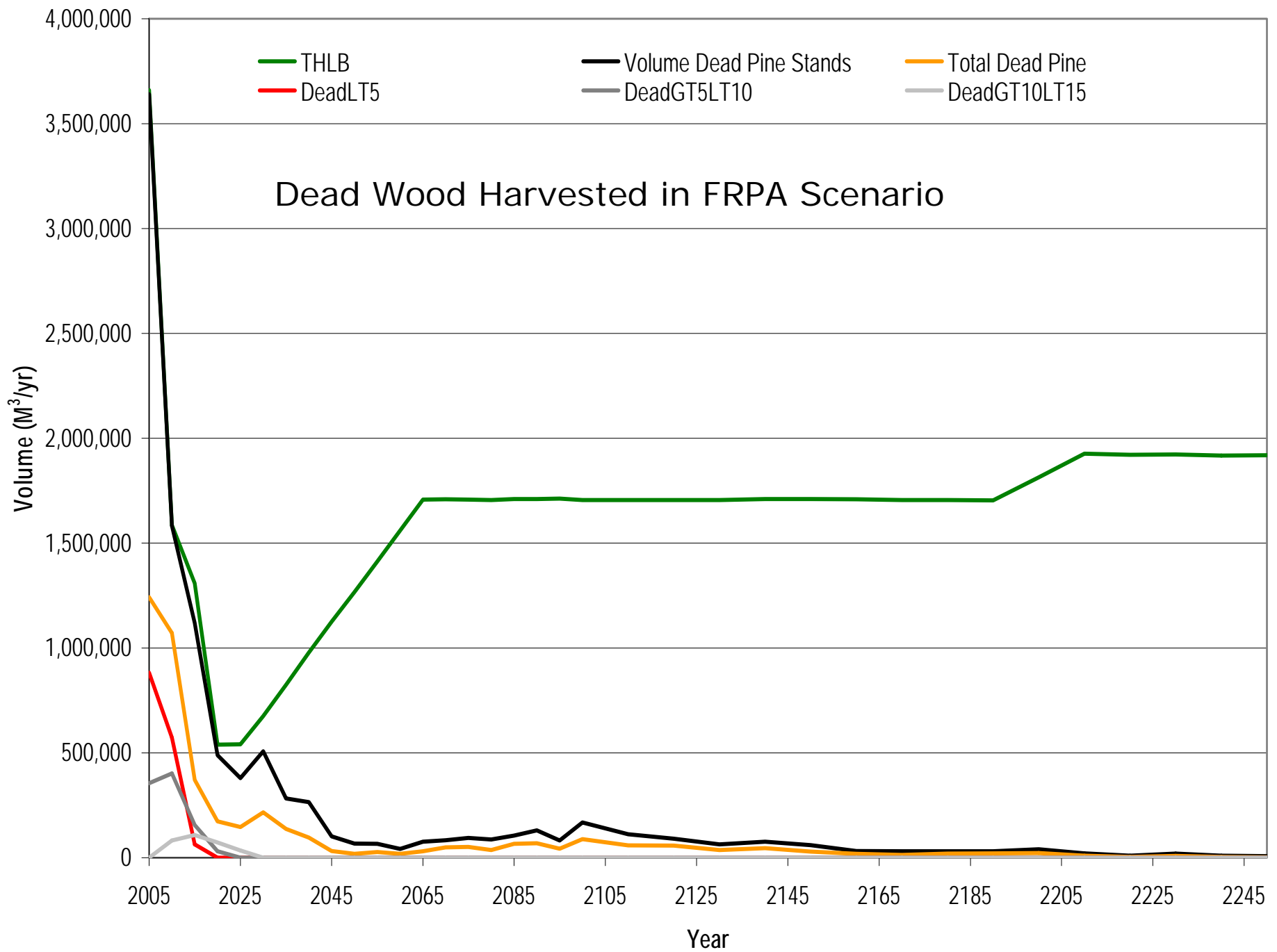
RESULTS DISCUSSION

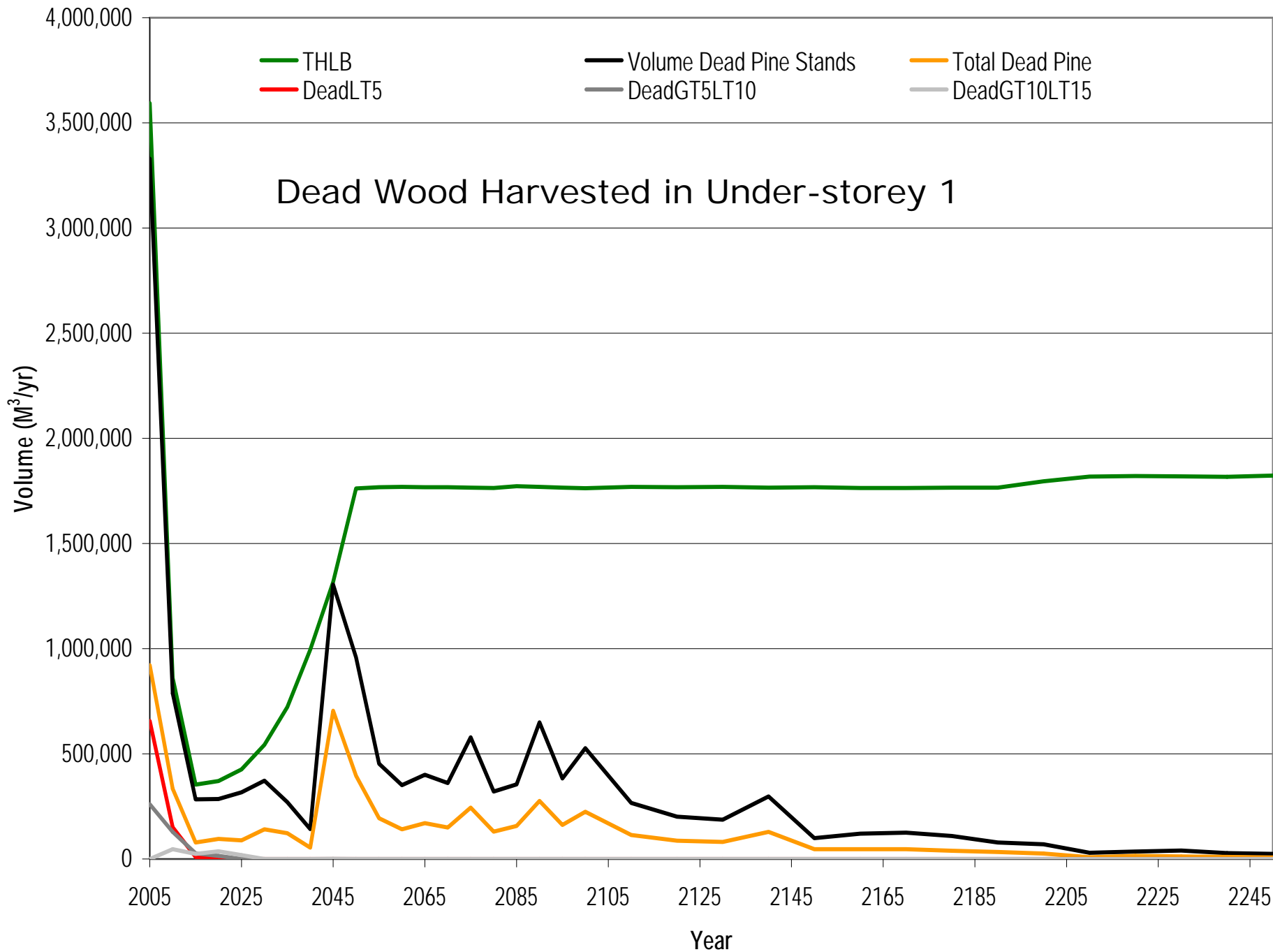
Under-Storey Sensitivity 2

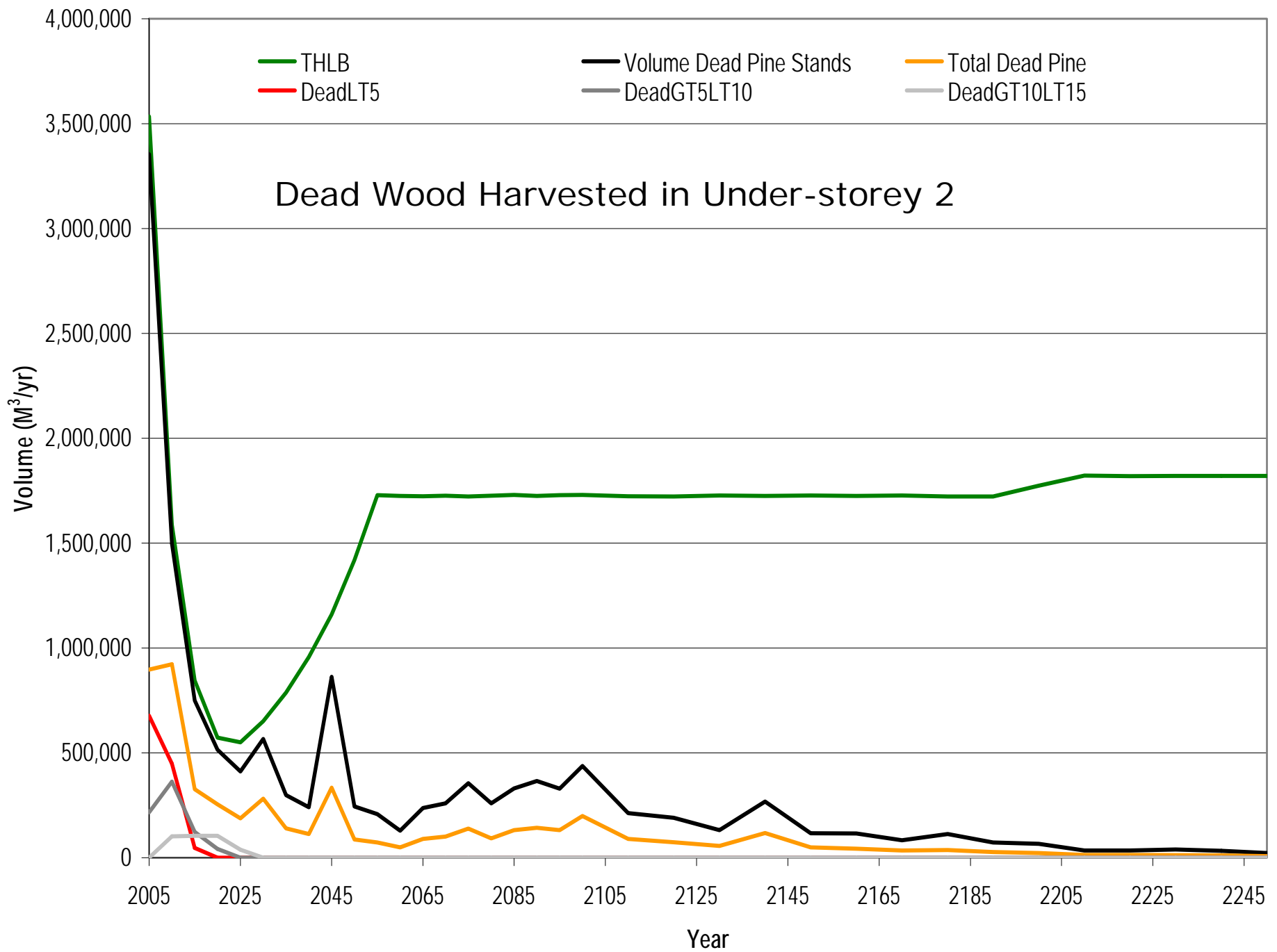
Dead Wood

The amount of merchantable dead wood harvested in the under-storey sensitivities is lower than in the FRPA Implementation Scenario









RESULTS DISCUSSION

Under-Storey Sensitivity 2

Non-Pine Stands

The amount of volume harvested in Non-Pine Stands is substantially higher in the Under-storey sensitivities.

The model is prevented from using its harvest priorities effectively



