



Mountain Pine Beetle Salvage Harvesting and Reforestation in British Columbia

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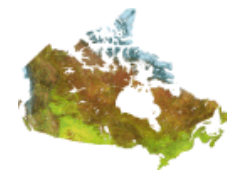




Outline:

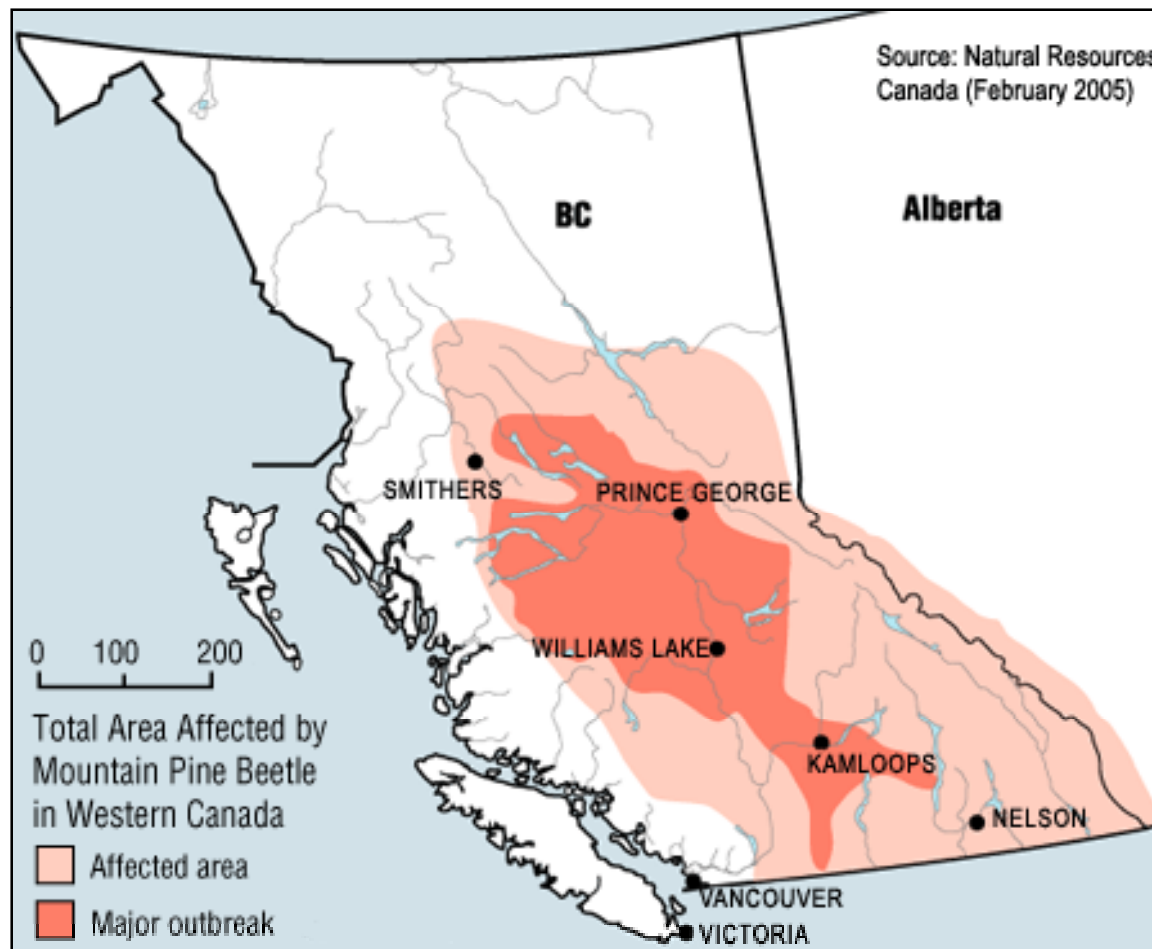
- 1. Overview of the MPB Issue in BC.**
- 2. What are some of the salvage and reforestation choices we are faced with? What tradeoffs are involved?**
- 3. Some preliminary findings.**
- 4. Summary and Conclusions.**

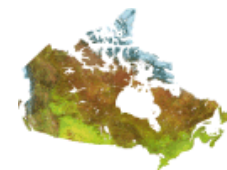




Overview of the MPB Issue in BC

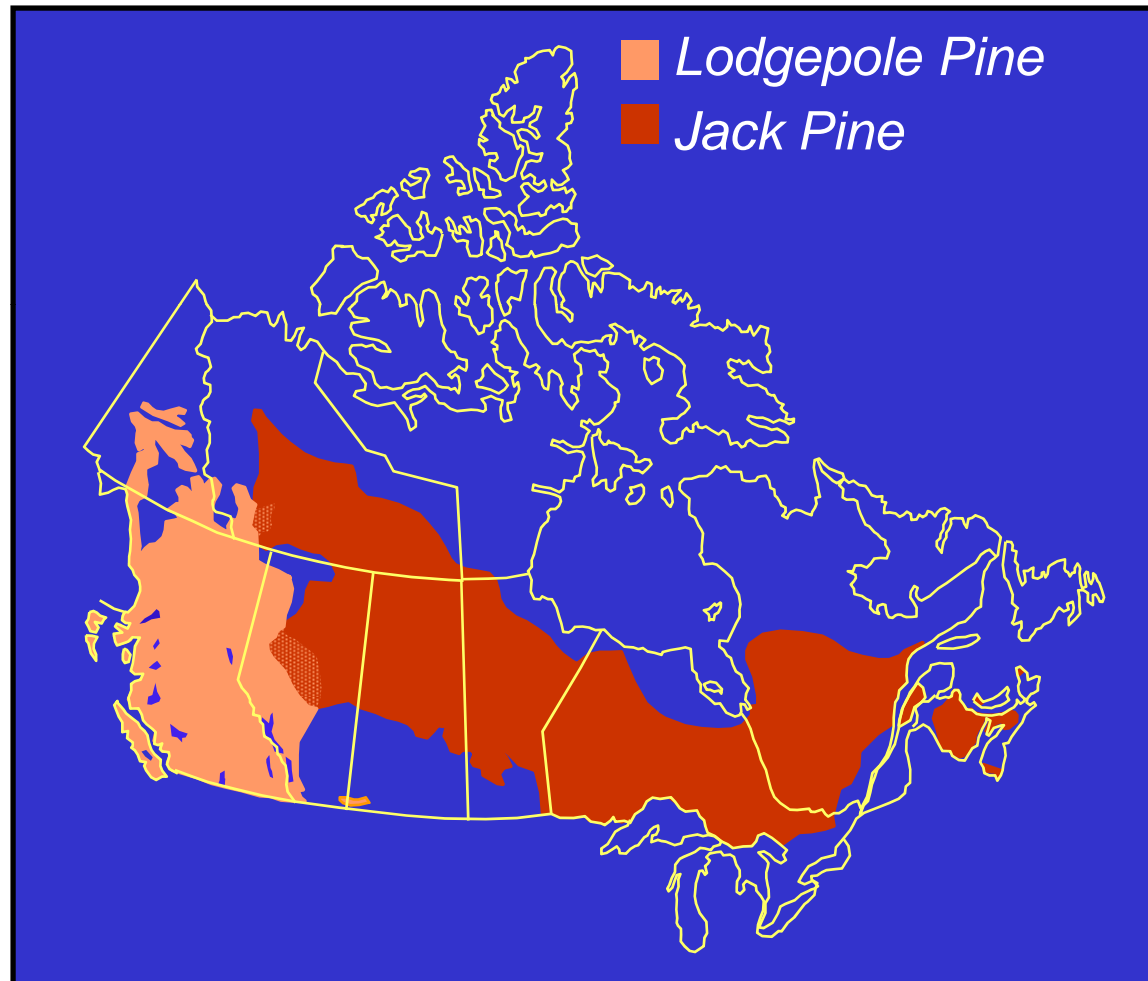
Mainly in BC's central interior, though recent expansion into Peace River region and Alberta is raising concern over the vulnerability of other regions, especially boreal jack pine stands.

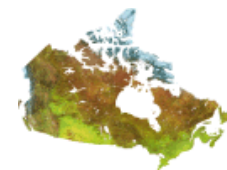




Overview of the MPB Issue in BC

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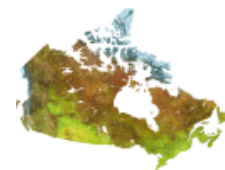


Overview of the MPB Issue in BC

Impact on BC forests:

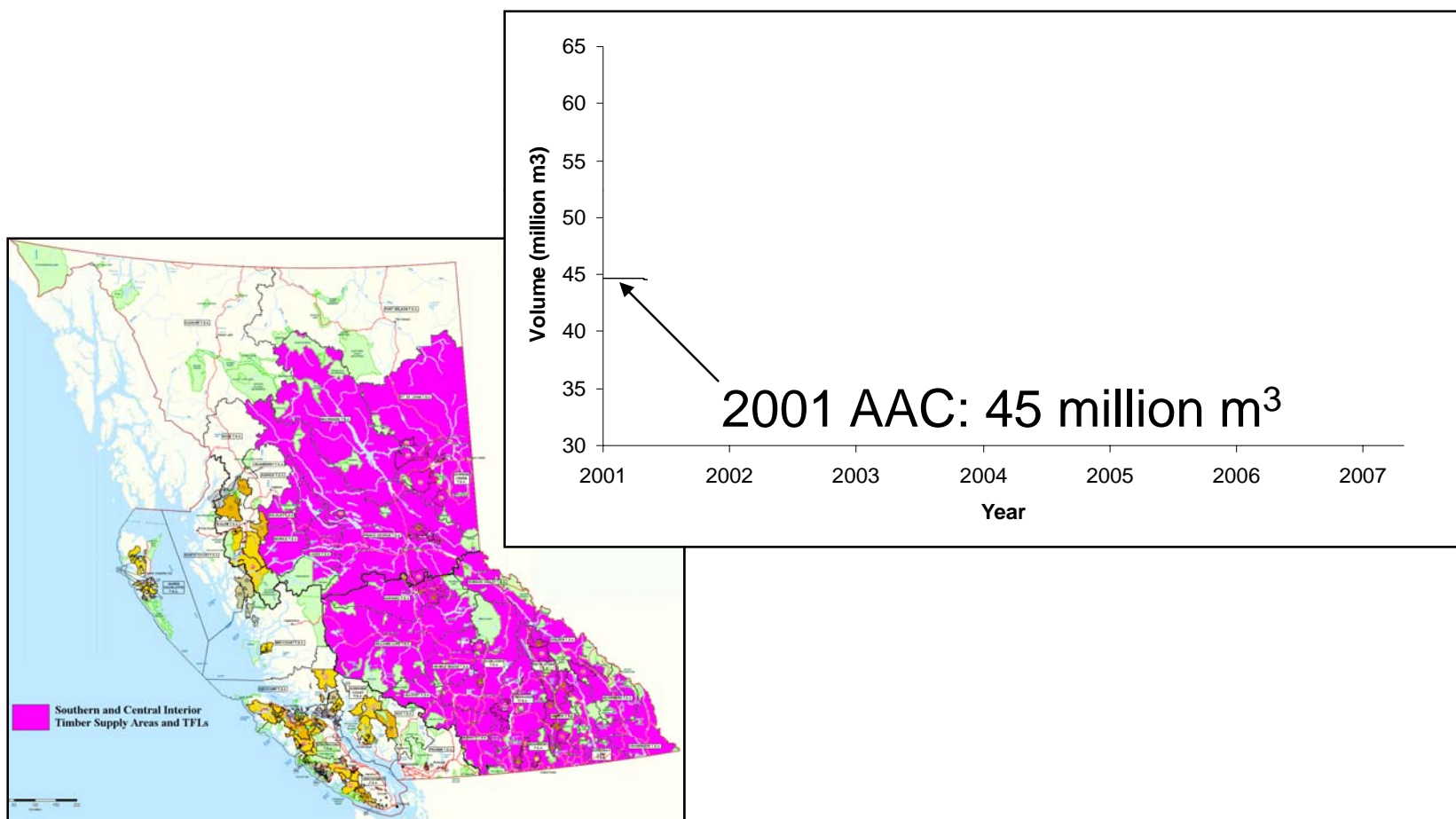
- As of 2006, MPB has affected 582 million cubic metres of timber (includes green, red and grey-attack, as well as timber that has been harvested).
- By the end of the outbreak, 80% of the mature pine inventory is expected to have been killed.
- Salvaging is being used to capture economic values before decay sets in, and to help ensure productive stands are re-established for future timber supplies.

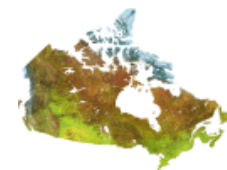




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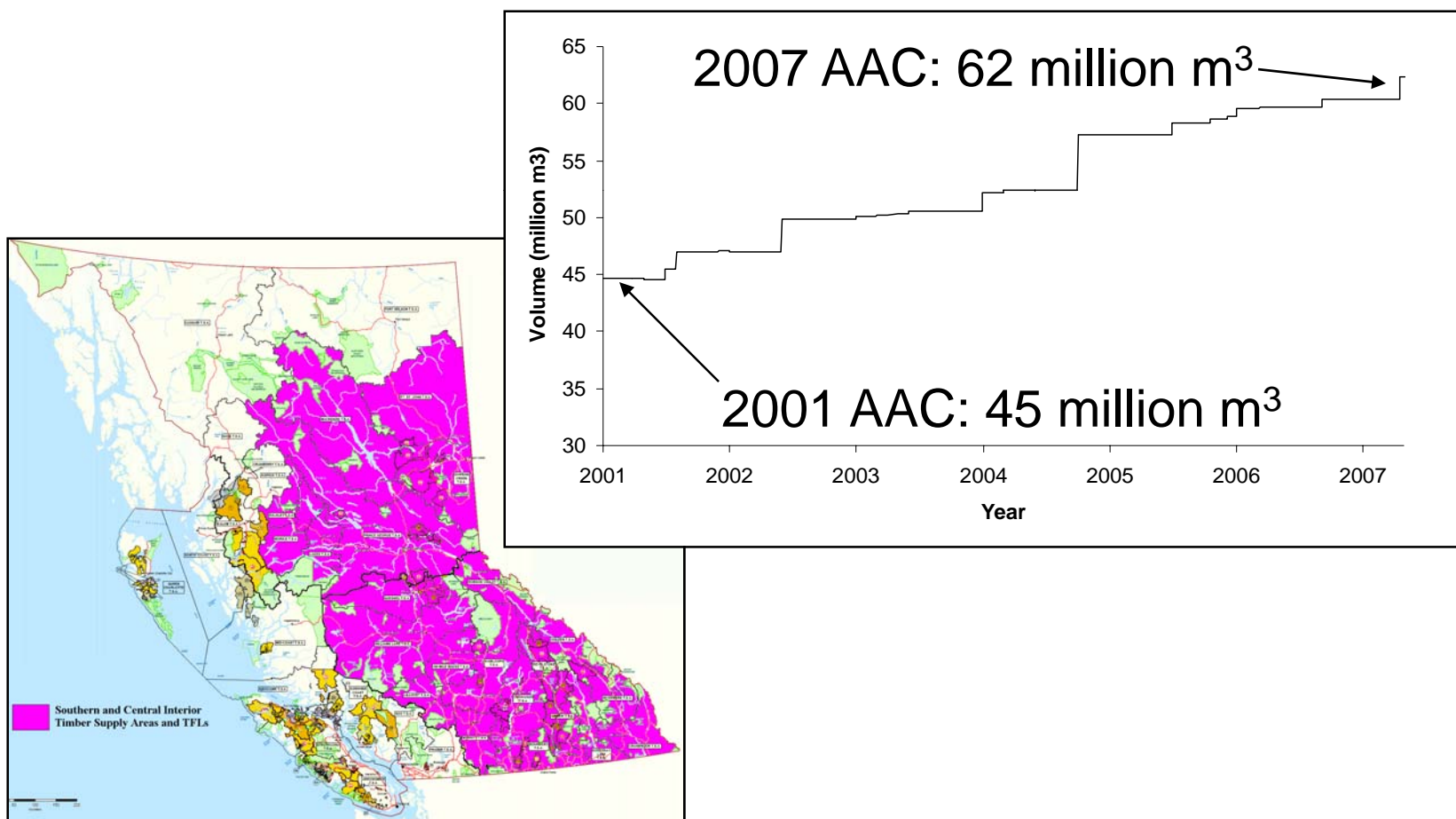
AACs in the southern and central interior have risen steadily since 2001:





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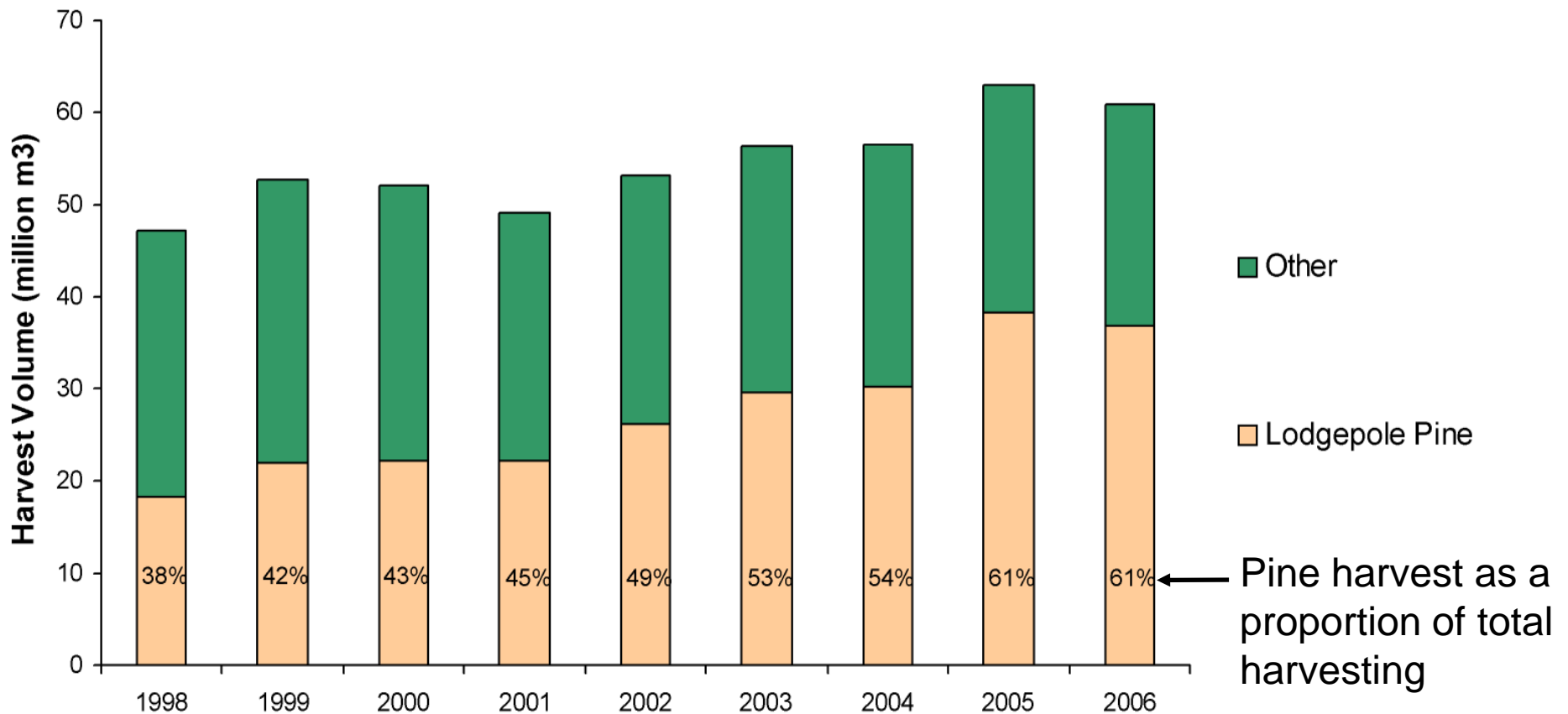
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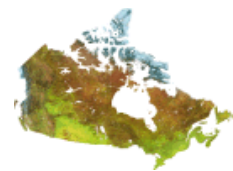




Overview of the MPB Issue in BC

The emphasis on pine harvesting in this region has also grown.





Salvage and Reforestation Choices

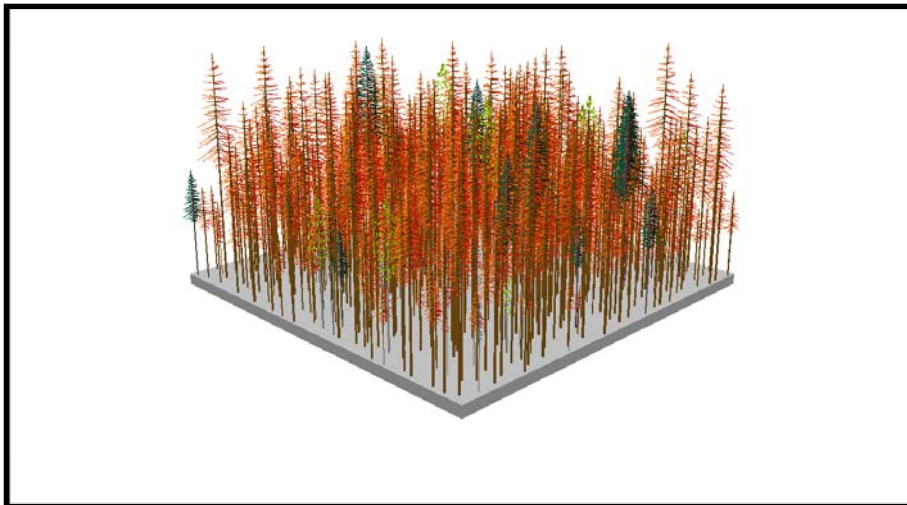
Difficult trade-offs are being grappled with:

- Trying to capture as much value as possible within the constraints of market conditions and the need to avoid undesirable impacts to non-timber values.
- Minimizing non-pine harvesting to preserve mid-term timber supplies, while considering operational/economic constraints and the needs of producers who may rely on non-pine volumes.
- Making the right silvicultural choices at the stand level to maximize social, ecological and economic values.



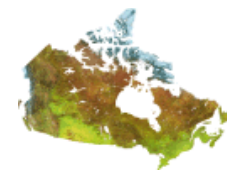


Salvage and Reforestation Choices

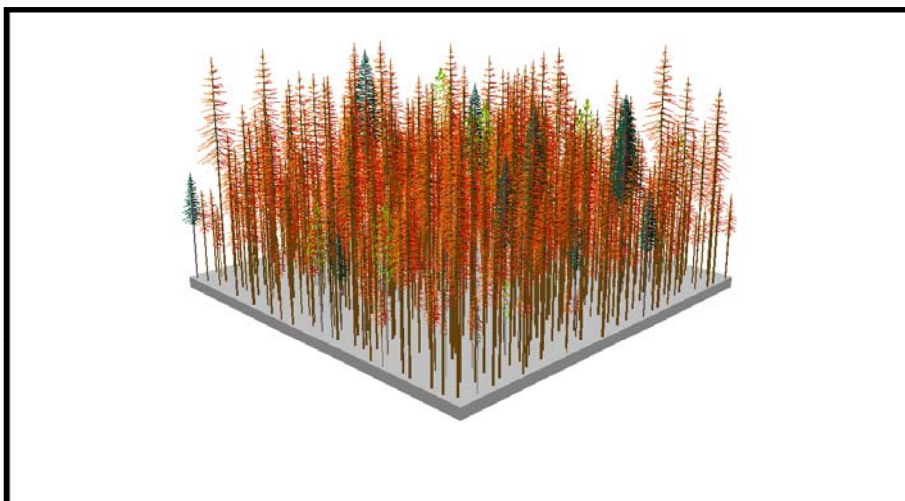


In pine leading stands....

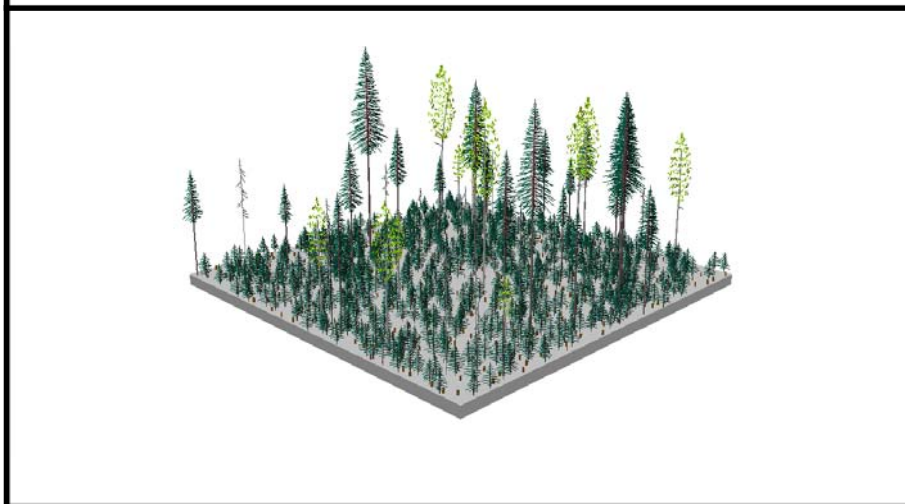




Salvage and Reforestation Choices



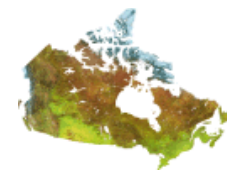
However, if we choose not to harvest....



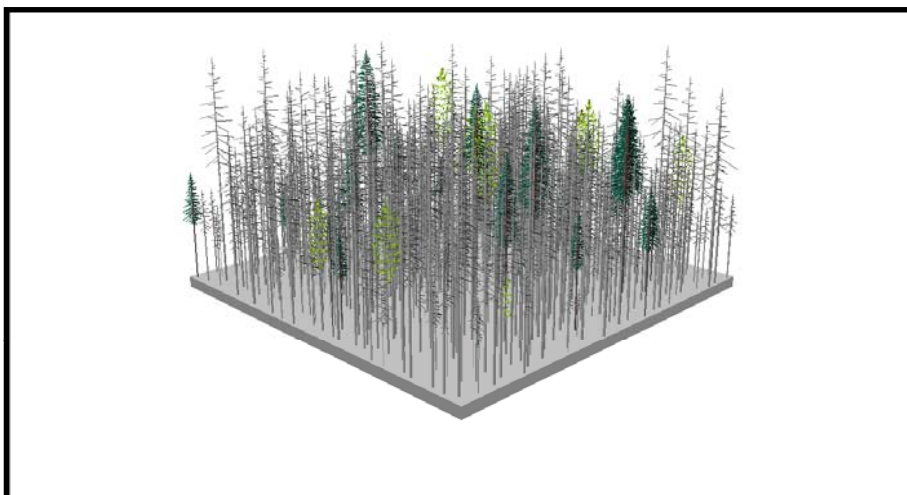
In pine leading stands....

we can harvest the dead pine,
and establish a productive new cohort of
regeneration.

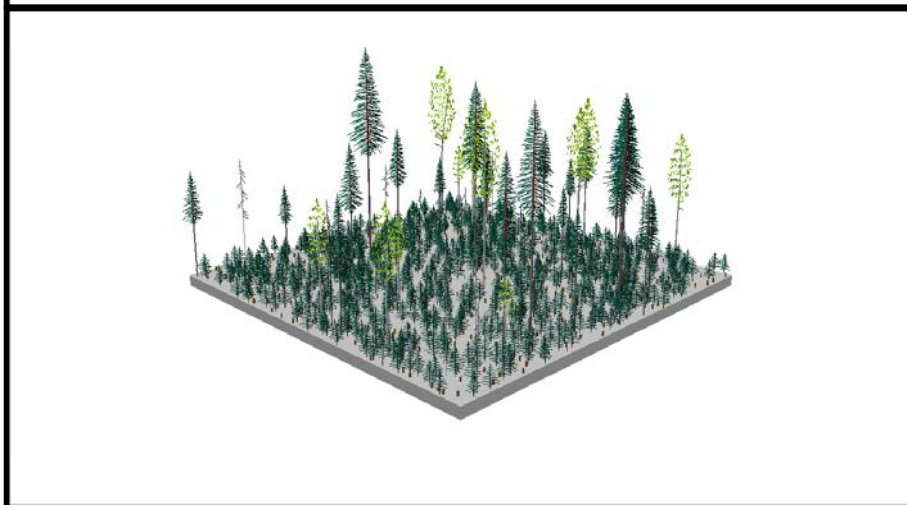


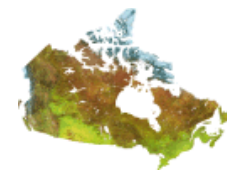


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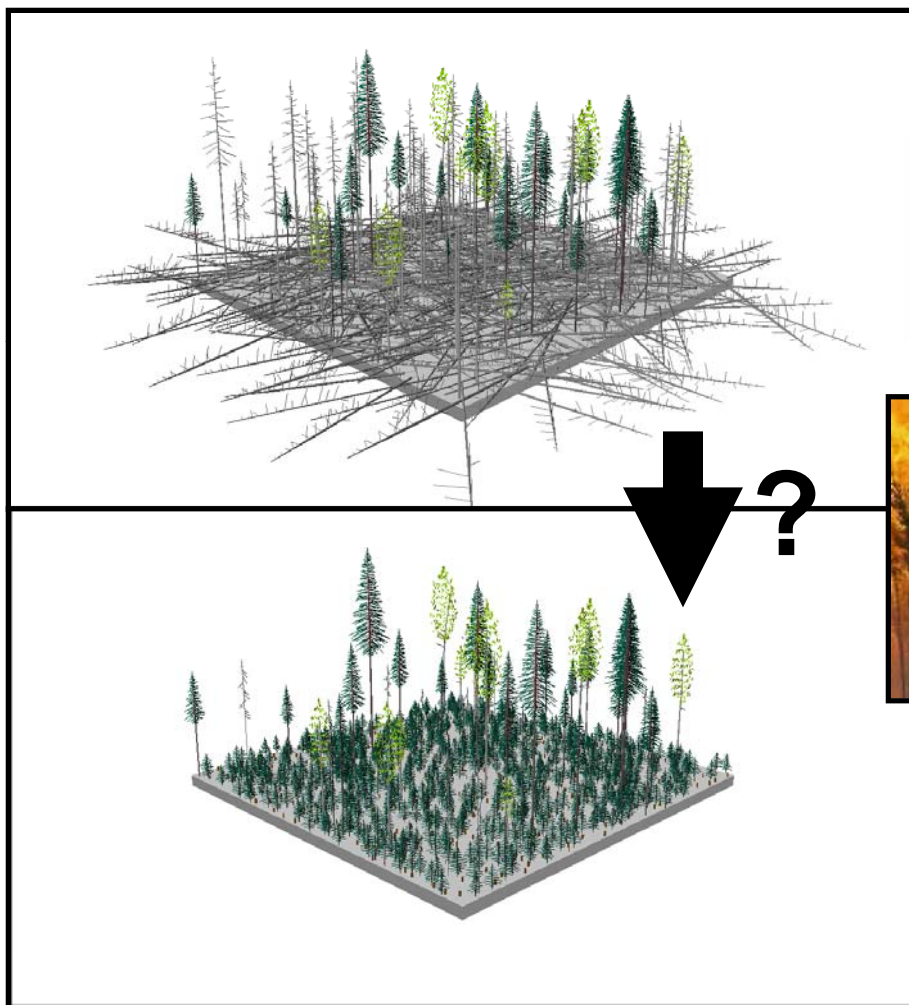


However, if we choose not to harvest....
Stand values will gradually deteriorate,





Salvage and Reforestation Choices



However, if we choose not to harvest....
Stand values will gradually deteriorate.
The dead over-story will “break-up”.
Though future yields are uncertain.

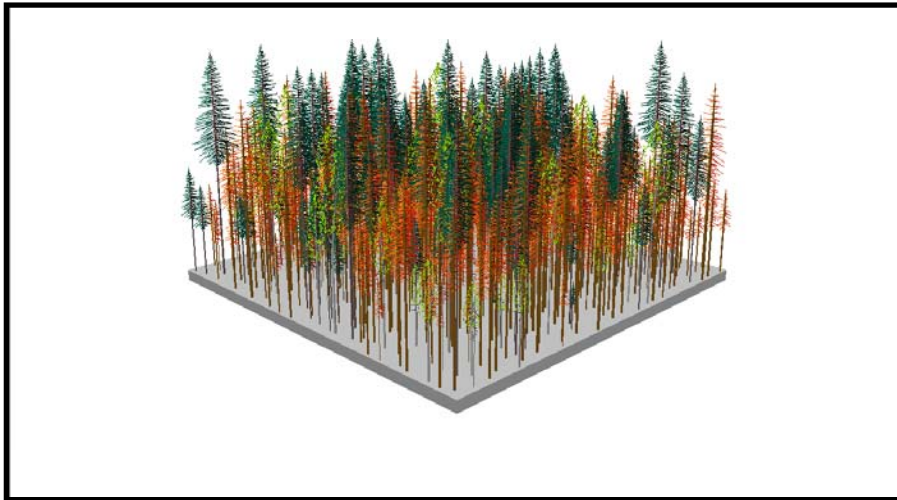


And fire may also
pose risks...



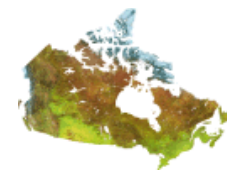


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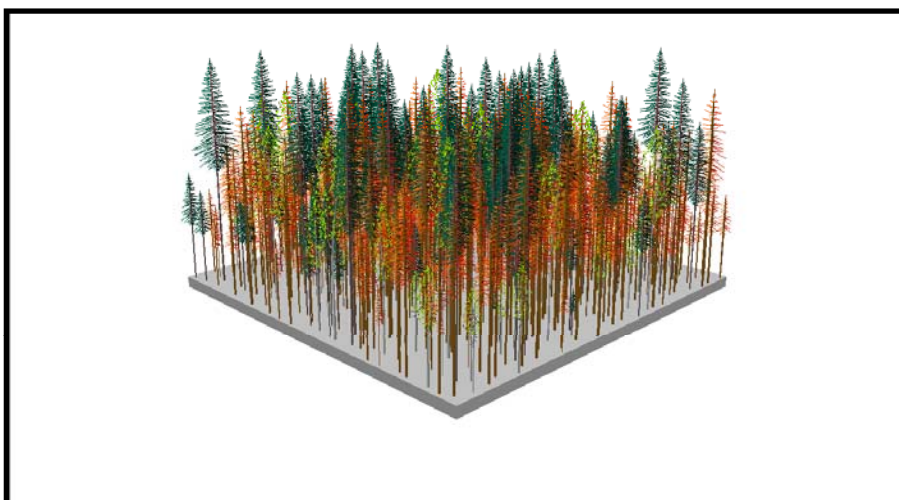


In mixed species stands....

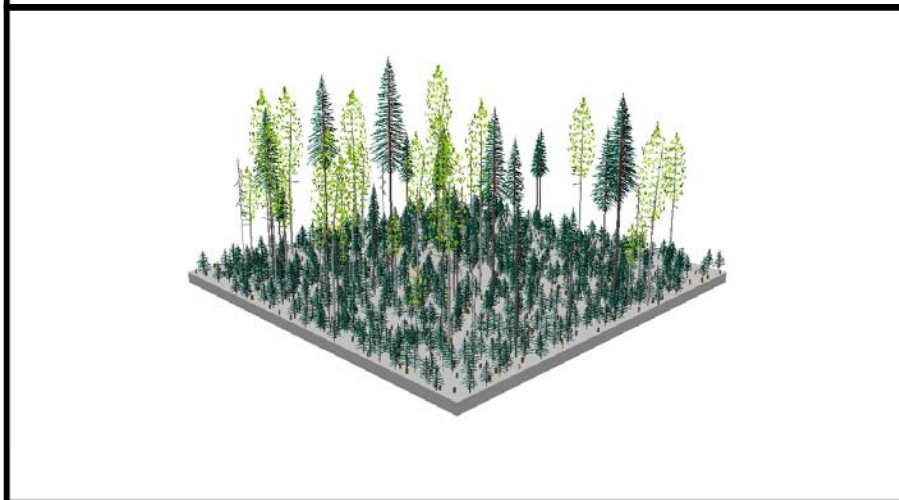




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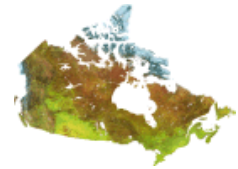


However, partial cutting may be another option in these stand types.

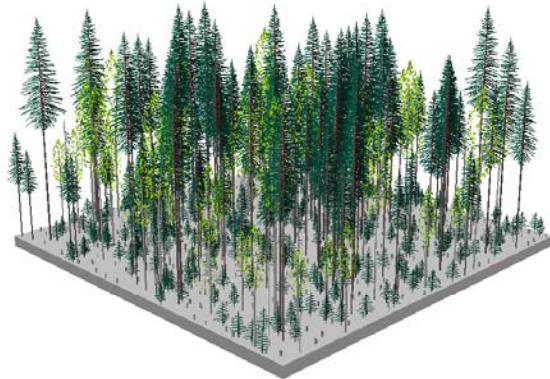


In mixed species stands....
we can harvest the dead pine, along with other merchantable timber,
and establish a productive new cohort of regeneration.





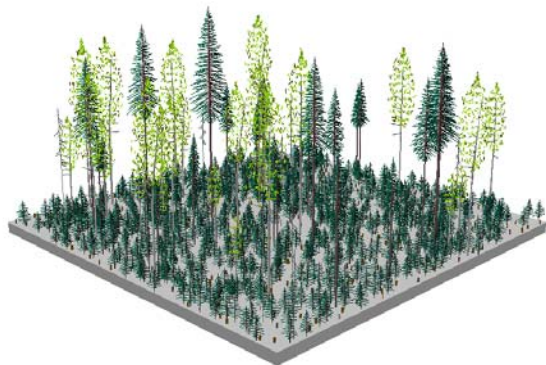
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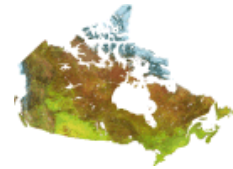


However, partial cutting may be another option in these stand types.

By retaining non-pine volumes, allowing them time to release,

and perhaps even encouraging some advance regeneration, we may be leaving a valuable legacy for the post-salvage era.





Salvage and Reforestation Choices

But...does partial cutting make sense economically?

- Although it's aesthetically appealing, do the numbers make sense? Or are we better-off sticking with conventional systems?

And what about areas that cannot be salvaged?

- Should we be spending money to reforest these areas?

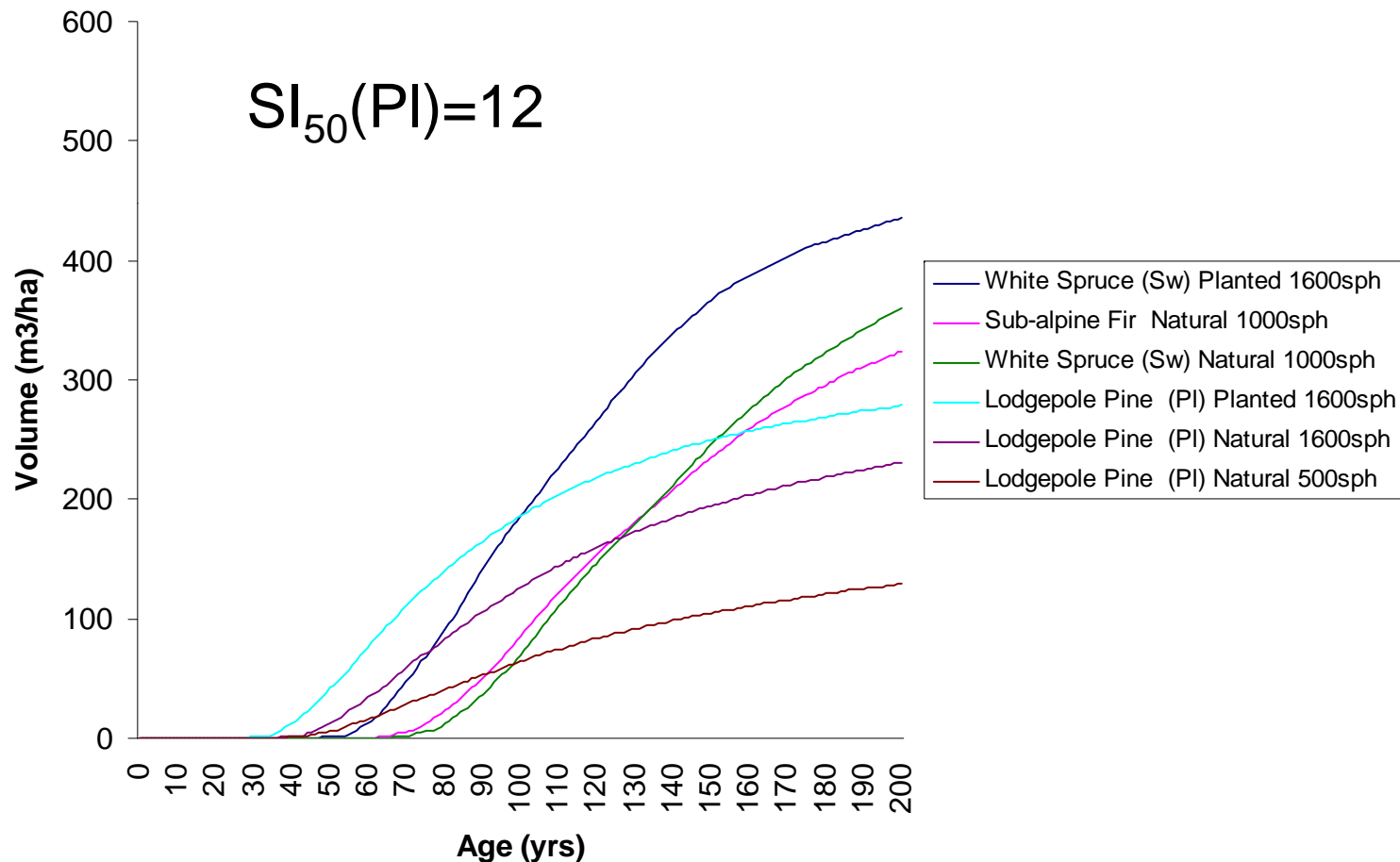
And even where we can salvage profitably, are there some stand types that are better left unsalvaged?

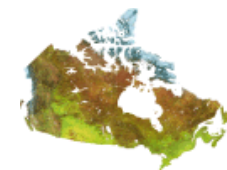
- What economic/silvicultural assumptions produce higher stand values when salvaging is foregone?



Salvage and Reforestation Choices

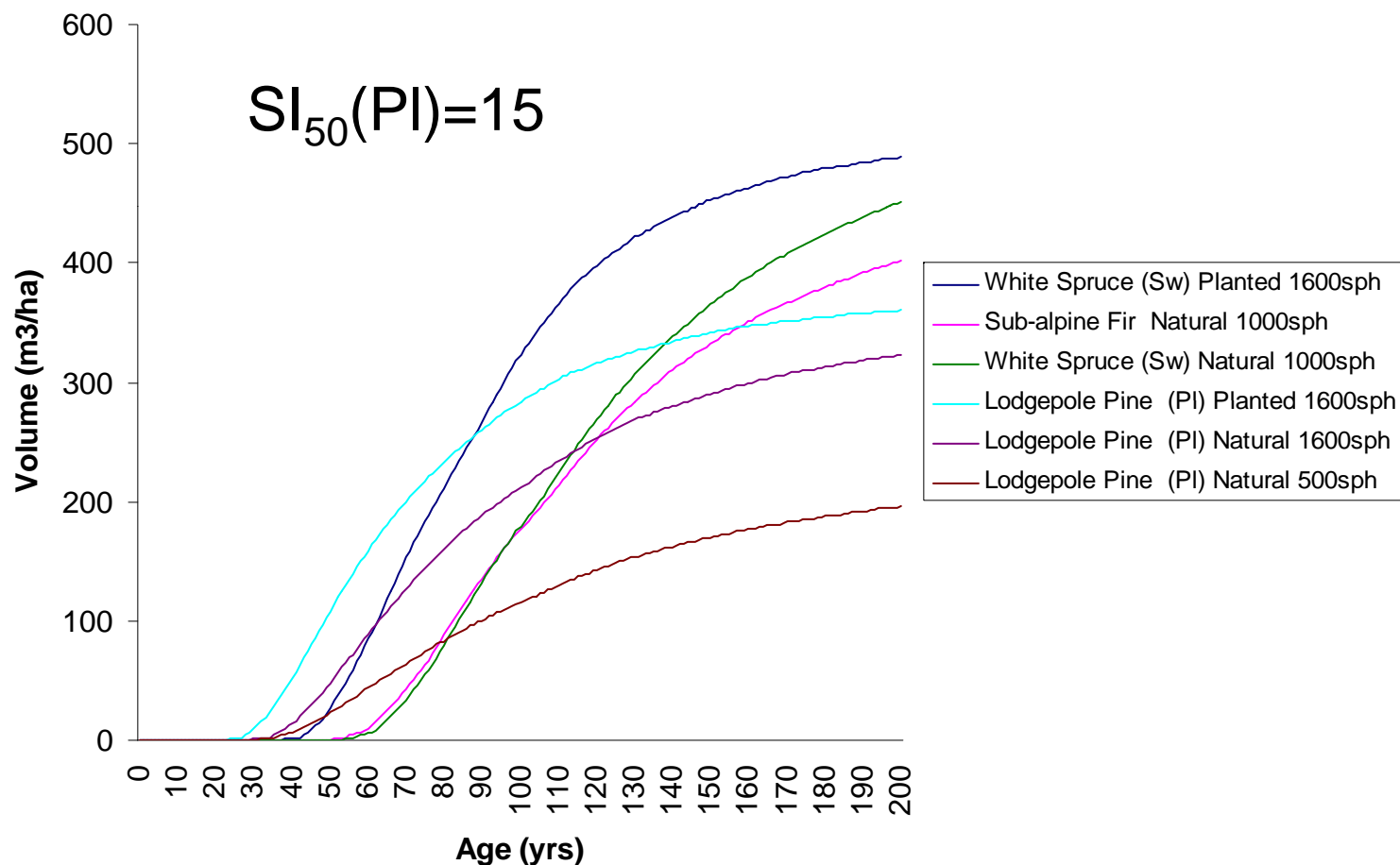
Future stand development can be estimated with existing yield data:





Salvage and Reforestation Choices

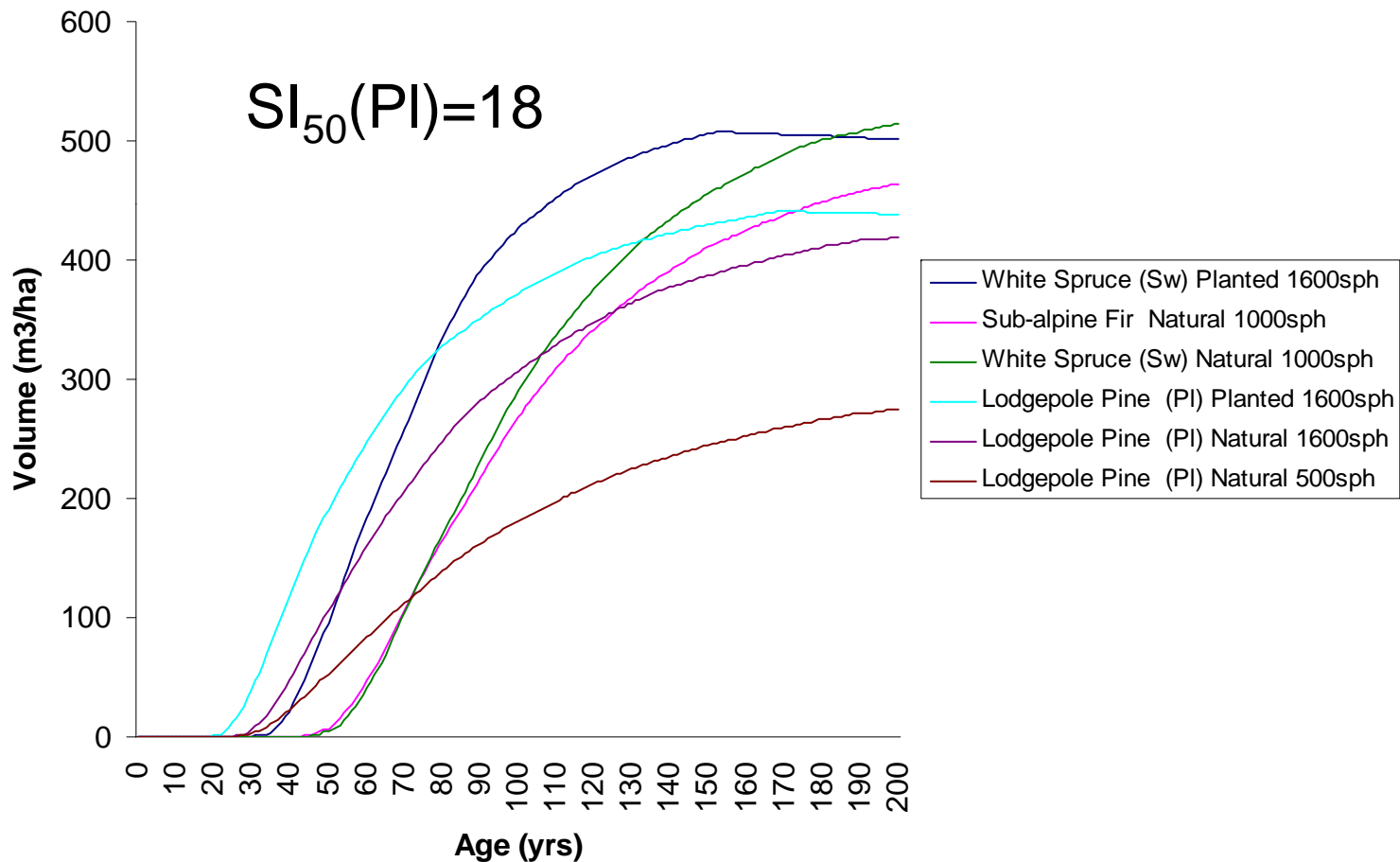
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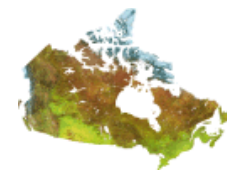




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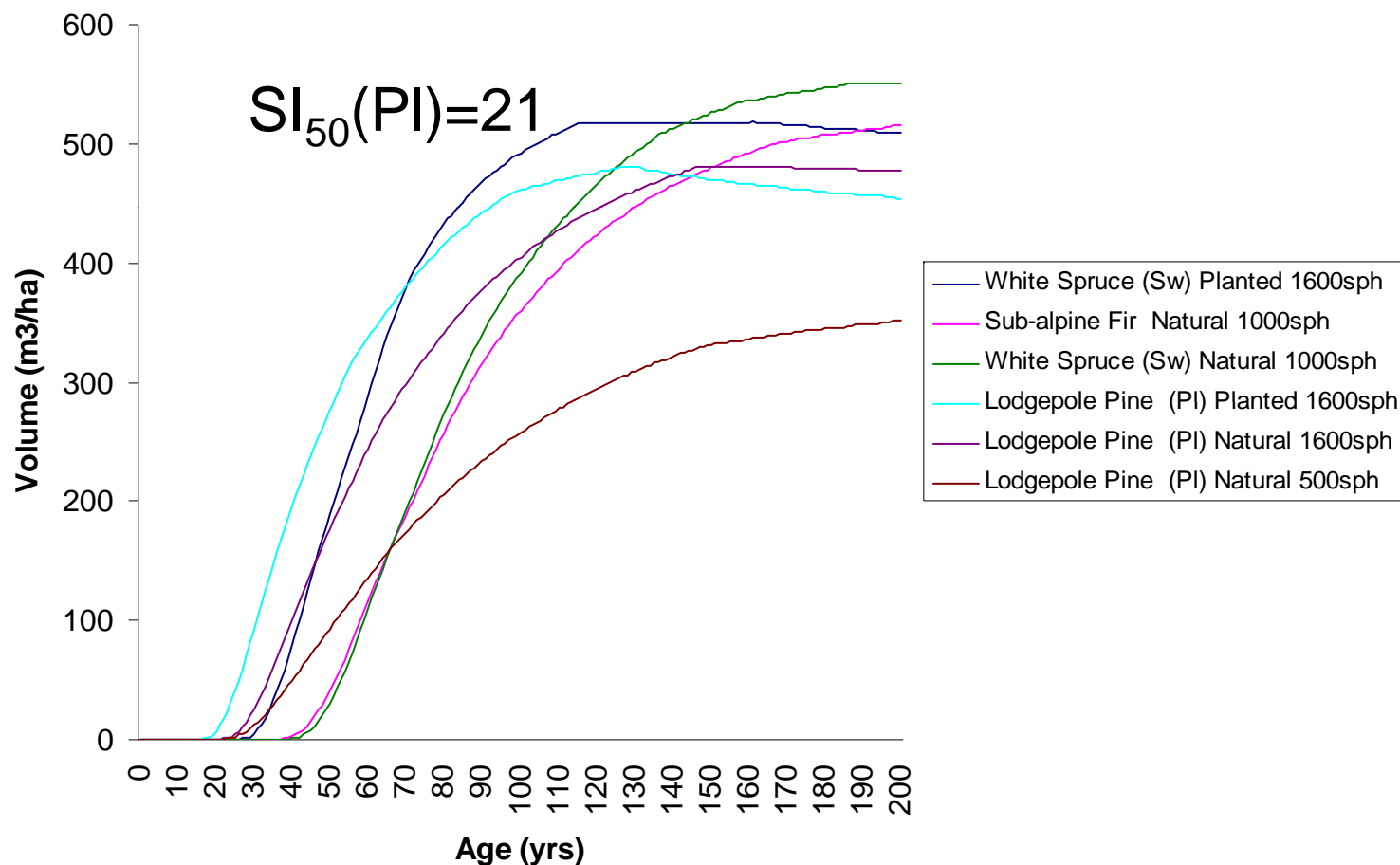
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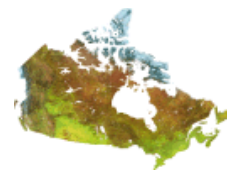


Salvage and Reforestation Choices

Comparisons of the long-term returns (NPV) resulting from our choices can be made based on assumptions of:

- Site productivity
- Current stumpage prices
- Future stumpage prices
- Initial harvest volumes (pine and non-pine)
- Silviculture and other forest management costs
- Natural regeneration delays, species and stocking



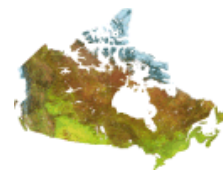


Some Initial Findings

Although there are many factors and uncertainties in analyses such as these, a few conclusions can be drawn:

The salvaging decision can be fairly obvious where salvaging is profitable, and managed stands will outperform natural regeneration.





Some Initial Findings



On the other hand, lower value stands with a positive outlook for natural regeneration may have greater value when salvaging is foregone. This may be especially true where:

- **Advance regeneration is expected to release as the pine dies.**
- **The subsequent stand is expected to be of substantial value.**
- **Significant damage to the AR is expected if salvaging occurs.**

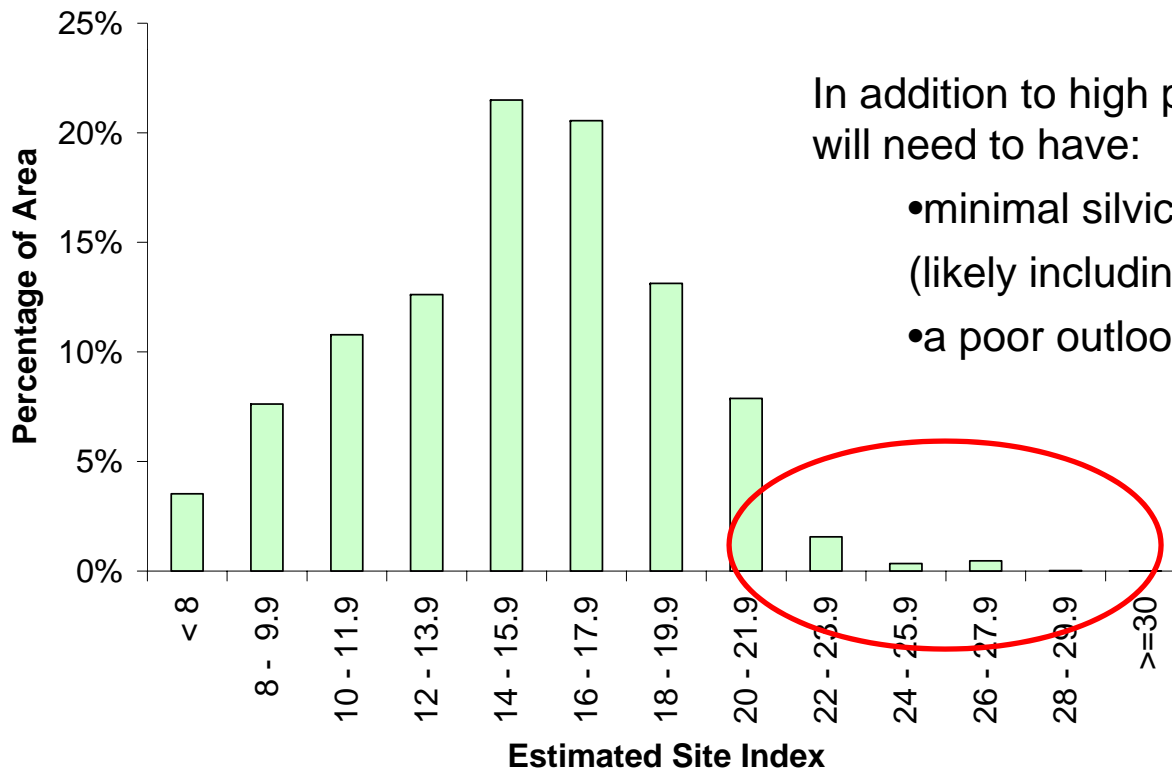




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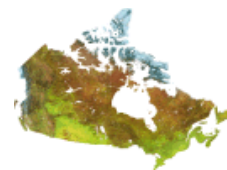
From a purely financial perspective, rehabilitation likely makes sense on only a small portion of the landbase.

Estimated Distribution of Site Indices on the Timber Harvesting Landbase (THLB) of the Prince George timber supply area.



In addition to high productivity, candidate sites will need to have:

- minimal silviculture costs (likely including existing access)
- a poor outlook for natural regeneration.



Some Initial Findings

Does partial cutting make sense economically?

The key question that needs to be asked is:

- Do the benefits of retaining live merchantable volume outweigh the opportunity costs of foregoing immediate revenues?

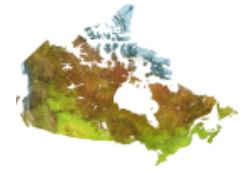
In most areas this depends on the outlook for growth in the residual stand, and the value of these volumes for mid-term timber supply.

However, depending on the up-front costs and volumes available, it may be more profitable on some sites to defer harvesting altogether, and leave salvage volumes to decay on the stump.



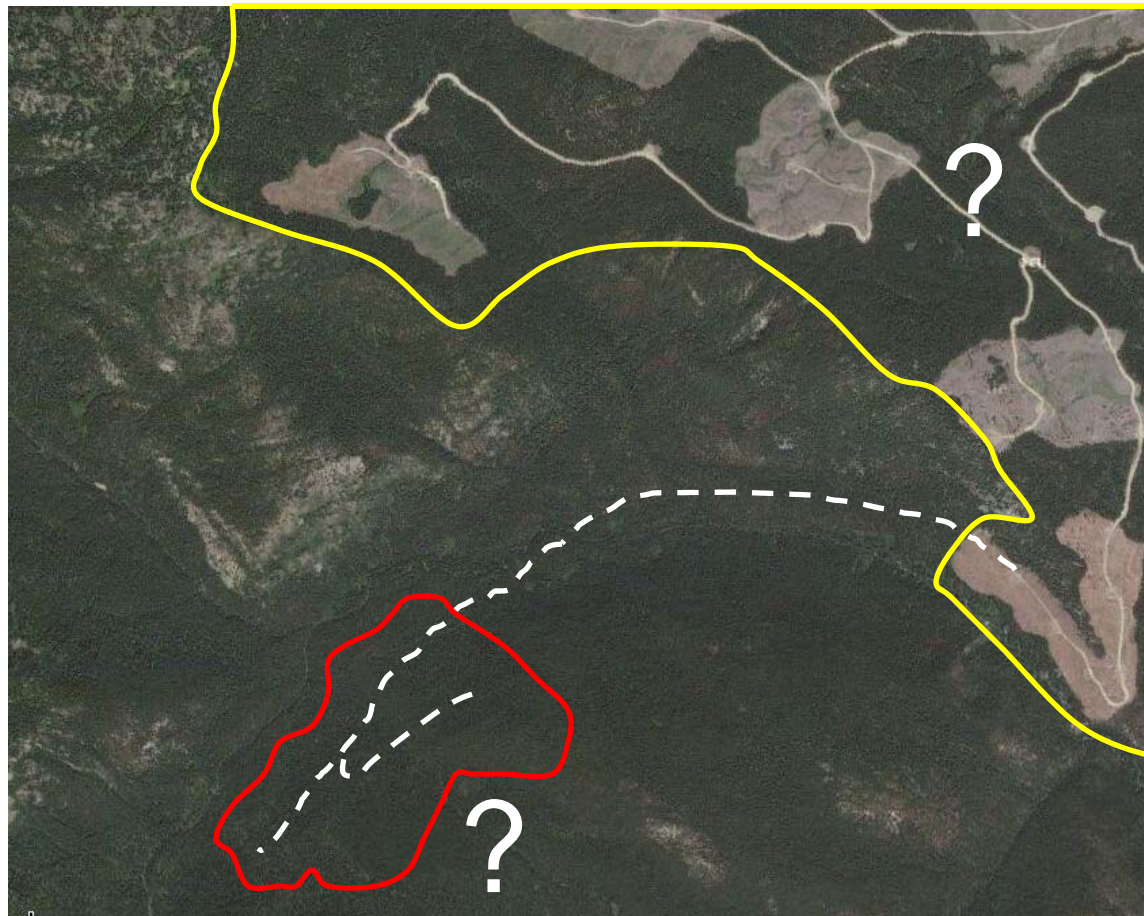
Photo: www.bcforestinformation.com

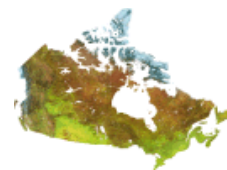




Some Initial Findings

This may be especially true of stands that require significant road development at the time of the initial stand entry.





Conclusions:

There is room for further forest economics research in the context of BC's mountain pine beetle outbreak.

We hope to continue examining the economics of salvage harvesting and rehabilitation, such as:

- Taking a closer look at incorporating risks associated with various stand-level choices and their impacts on future benefits.**
- Trying to explicitly include some key non-timber values, e.g. carbon.**

We'd welcome any comments or suggestions....

