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Opinions on Some Key Aspects of the NSR Debate



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Key Issues around NSR

- Need good linkages between young stand attributes and the growth models (Research).
- Accurately assign stands to the appropriate yield curves (inventories and timber supply analysis).
- Check that actual development is matching the model projections (monitoring).
- Ensure we have appropriate and up to date stocking standards which reflect desired future yields and quality.
- Understand the importance of scale; stand versus forest level assessments and decision-making.

- Ensure that standards and treatment decisions are based on rigorous financial and risk analyses:
 - The cost/benefits of prevention are usually superior to fixing problems once they have occurred.
 - Site quality and location (relative to infrastructure) are critical.
- Make sure current basic reforestation programs are not producing stands which will become NSR or will substantially underperform our expectations.
- Only rehabilitate NSR stands when the cost/benefits are positive and this is the highest priority treatment (relative to all other investment opportunities).

Examples of problems to reduce the focus on:

- NSR or poorly performing stands on poor quality sites far from infrastructure:
 - it is not economically viable to invest in these sites and,
 - it is unlikely these sites will be included in the future intensively managed forest landbase.
- Moderately to marginally understocked stands on medium to good sites:
 - risk analysis and past results show it is usually better to assign realistic yield curves than to rehabilitate.
 - plan to do a better job after the next harvest

Examples of NSR or pending problems to increase the focus on

- MPB impacted or otherwise damaged stands which are now considered “SR or nearly SR” on medium to good sites within reasonable proximity to infrastructure:
 - includes stands with 2nd structure and AC2-3 managed stands,
 - these stands likely to become NSR due to damage caused by the breakup of the overstory or will burn in the future.
- Burnt, unconstrained medium to good sites within reasonable proximity to infrastructure.
- Low density, PI dominated stands being produced according to the current stocking standards in many parts of the interior

Are we growing PI properly?

The Problems:

- Lots of PI-dominated stands established consistent with the stocking standards at similar, low densities:
 - Some good reasons for this; rapid early growth, wide ecological amplitude, and high tolerances for harsh site and environmental factors.
 - However young PI is susceptible to a wide range of damaging agents commonly found in BC.
 - The most prevalent serious diseases are the HPSRs; (Western gall rust and Commandra and Stalactiform blister rusts).
 - Main stem infections of HPSRs on young PI are usually fatal before the trees reach a merchantable age.

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The Problems (Cont'd):

- The prevalence and significance of the HPSRs are, amongst other factors, related to climate. For example:
 - for the old Cariboo Forest Region for HPSRs, the SBS, SBPS, ICH are all high hazard zones.
 - a significant portion of the THLB in the Cariboo consists of these BEC units and these are some of the most productive sites within close proximity to infrastructure.
 - managed PI-leading stands dominate in these BEC units.
- Recent infections of HPSRs and other diseases are not easily identifiable and young stands can still be susceptible to infection until well after free growing is declared.

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The Problems (Cont'd):

- Recent studies have found potential serious incidences of disease and/or damage in 15 to 40 year old FTG stands:
 - *FREP Report 13*; Lakes TSA: 27% of stands with 20% and 67% of stands with 10% HPSR (sampled).
 - *FREP Report 19*; Vanderhoof FD: 20 to 50% with HPSR (ocular estimates).
 - *Decline of planted PI in the southern interior of BC, Mather, Simard et al.*; SIFR: overall 20% with lethal stem disease; for SBS, SBPS 35%; overall >50% of PI was lethally damaged (sampled).
 - *CMI Time 2 Measurement Results*; TFL 52: 43% with stem disease; equates to 45% of basal area (sampled).

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Summary of the Problems:

- Management of PI-leading stands to the stocking standards (1200 to 700 well spaced sph) and some spacing of FTG stands in high hazard areas appears to be producing stands which are at high risk to significant losses due to forest health agents.
- Additionally, many PI-leading stands grown at low densities on medium to good sites in areas at risk to heavy snow and ice have common evidence of poor quality (live crowns >40%, common heavy branching, forks or crooks and poor taper).

Are we growing PI properly?

Natural regenerated vs Managed PI:

- Natural:
 - often regenerates naturally at moderate to high densities (commonly >6000sph) following wildfire or logging,
 - typically resultant stands have stems with small live crowns and small branches,
 - stands can have common incidence of damaging agents but have enough stems to buffer the losses
- Managed:
 - stands with lower densities that maximize diameter growth on the largest stems,
 - generally result in large live crowns and large branches (worse on better sites)

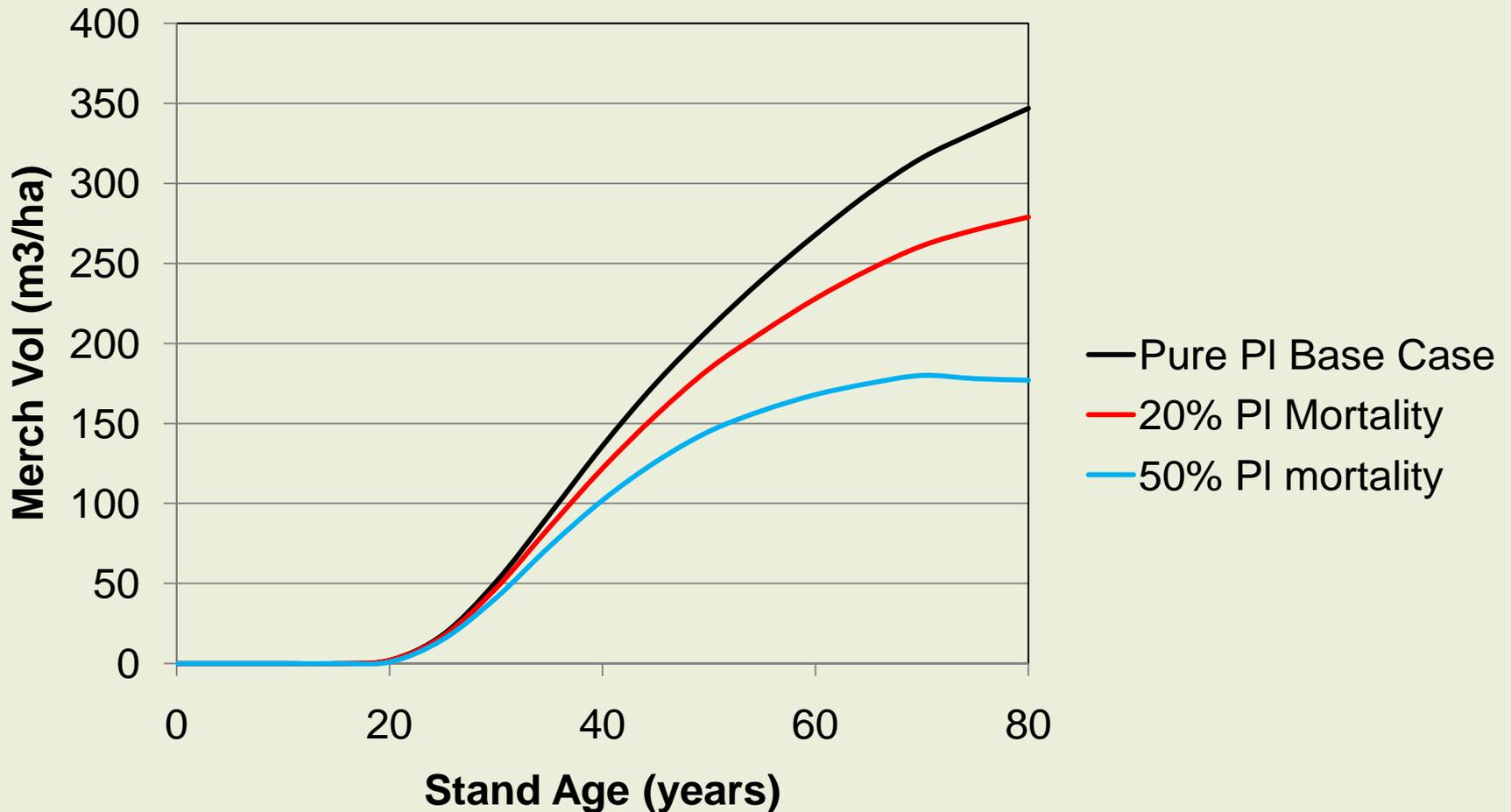
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The Implications:

- There should be significant concern given the:
 - Extensive and ongoing establishment of PI at unnaturally low densities,
 - Widespread range and incidence of damaging agents which affect PI and the uncertainty about the impacts of these issues on future stand development,
 - Potential incremental impacts of changing climate on tree vigor and the incidence and severity of damaging agents,
 - Importance of existing managed and future stands to the mid to long term timber supply in MPB-impacted FMUs,

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Volume Impacts of disease-related mortality in managed PI:



1600sph; SI=19.5m; harvest age=80yrs; base case with default OAFs

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The Implications (Cont'd):

- There should be significant concern given the:
 - The forest industry (including public and licensees) are potentially wasting a lot of money (substantial portion of the planting and tending costs of \$>800/ha) establishing non-resilient, poor quality PI stands,
 - Unsuitability of affected stands for viable subsequent intensive silviculture treatments such as fertilization, spacing, or pruning.

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Conclusions:

- There is enough evidence to show there are problems which likely will have serious negative impacts or at a minimum are huge opportunities for improvement.
- We need to address these issues asap.

Are we growing PI properly?

Short Term Recommendations (within existing system):

- Better understanding of the potential impacts should be a top priority via monitoring programs that track actual stand growth and that can be linked to the inventory and timber supply (e.g.: the government's CMI Program).
- Changes to stocking standards:
 - Significantly increase target and minimum densities for PI
 - Promote the use of alternative species on suitable sites by maintaining the existing stocking targets for these species (as opposed to higher densities if PI is to be the major species).

Recommendations for systematic change:

- Re-integration of reforestation into holistic management throughout the rotation.
- An improved linkage between the costs and benefits of long term forest management.
- Zonation of the forest land base based on the viability of management intensity (amongst other things).