

Bark Beetle Impacts & Harvest Priority Rating: Operational Decisions To Achieve Strategic Level Outcomes

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The bark beetle epidemic is causing us to rethink which trees and stands should be cut, when and where, and which ones should be left behind. This presentation is designed to introduce some new tools for providing a more operationally meaningful answer to these questions. Current guidance on this topic offers the following solutions:

- Pure lodgepole pine stands are preferred over mixtures.
- Stand with a shorter shelf life should be harvested first.
- Stands with a viable understory should be left behind, unless assurances can be provided that most of the regeneration will be protected from damage during harvesting operations.

There are a number of problems in translating these guidelines into operationally meaningful guidelines. When does a pure lodgepole pine stand become a mixture? How can we recognize stands with a short versus long shelf life? How can we recognize a viable understory when we see it? How does the answer to these questions change when referring to different landscapes, in different climatic regions, made up of different species compositions and sizes of timber?

What is needed is a coordinated approach to answering these questions, so that Government and licensees can conduct operational activities in such a way so as to:

- Minimize losses due to the impact of bark beetles.
- Maximize the availability of an economically accessible timber supply in the intermediate to longer term.

As a result we should recognize the following:

- That this is a question of value rather than volume.
- That the main driver affecting changes in stand value is the shelf life of trees, and that this is related to the time of individual tree deaths and the expected rate of degrade and loss in recoverable volume.

As a result we need a method for connecting tree-level impacts with changes in stand and landscape characteristics over time if we are to undertake a meaningful assessment of

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bark beetle impacts, and if as a result, we are to then develop meaningful harvesting guidelines. Meaningful guidelines are ones that can be applied operationally to specific landscapes in the course of doing cutblock layout and developing harvesting and silviculture prescriptions.

Since 1998, with the support of Tolko Industries Ltd in the Cariboo², ForesTree Dynamics Ltd developed a number of tools for connecting tree level details to stand and landscape level outcomes. These include:

- A reliable system for stand structure classification, that allows operational people to more quickly assess and characterize stands with different diameter distributions without necessarily having to establish plots.
- A method for enhancing inventories with tree level details in the form of stand and stock tables; these can be / are also described in terms of stand structure classification.
- A bark beetle simulation program that estimates impacts of bark beetles at the tree, stand, landscape and whole forest levels of detail.

The latter program simulates the spread of bark beetles from one landscape to the next, and within each landscape, one stand to the next, and within each stand, one tree to the next. It explicitly accounts for impacts in terms of changes in log grade and recoverable log volume as it relates to the time from tree death and it does so that the impacts can be assessed across large landscapes. This program has been used to forecast changes in landscape conditions in the Cariboo representing approximately 2 million hectares. It has also been used to characterize changes in tree and stand value.

As a separate but related initiative, Canadian Forest Products (Prince George) has also developed stand and stock table representations for approximately 4 million hectares of merchantable stands in their new VRI inventory. There is potential to draw on this information to undertake a bark beetle impact assessment using the bark beetle simulator referred to previously. The opportunity also exists to further explore these impacts in terms of alternative harvest schedules with the goal of minimizing losses and maximizing availability of timber in the intermediate to long term. The purpose of undertaking such an exploration would be to design more strategically applicable and operationally meaningful stand-level, harvest priority rating guidelines. It is recommended that this be done as a collective effort so that in the final analyses, the likelihood of achieving the desired strategic level outcomes is maximized through the application of such operational guidelines on a day-to-day basis.

² ... and its predecessor companies including Riverside Forest Products Ltd., and Lignum Ltd before that.