Provincial-Level Projection of the Current Mountain Pine Beetle Outbreak:

Documentation of revisions to the model resulting in BCMPB.v5

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1.0 Introduction and Purpose of this Document 2
2.0 Updates to the Beetle Projection Model 3
2.1 Recording Pine Kill 3
2.2 Tracking Beetle History 3

1.0 Introduction and Purpose of this Document

For each of the past five years, the Ministry of Forests and Range has led development of a model that produces a provincial-level projection of the current mountain pine beetle outbreak (BCMPB). The model is intended to produce output that can inform provincial-level, strategic decision-making. Documentation from previous years describes the basis of the model. Here, we focus on aspects that have changed over the past year, and refer interested readers to documents from prior years for the description of the core model, which remains unchanged.

This document, which describes the changes to the beetle projection model, is intended for potential users of BCMPB. This description is provided for completeness of understanding the model, rather than with the intention that the model might be modified by users of the model. People interested in learning about model behaviour, as well as potential users of BCMPB, should consult the documents from prior years, which describe the core model.

During the first year of the project, we concentrated on developing a management model that represented "leading edge" beetle control efforts. In the second year of the project, we began to more fully specify the salvage harvesting components of the model in an attempt to better understand non-recovered loss implications. The third year, we introduced additional detail that we believed was needed to adequately reflect the response of the existing forest industry and possible "new" industries to the outbreak. This year, we only changed the Data Preparation sub step of the beetle projection model. We did **not** run a management scenario this year.

Please consult the following documents for a complete description of the model (BCMPB.v5).

- Description of the core model produced in year 2 (resulting in BCMPB.v2): http://www.for.gov.bc.ca/hre/bcmpb/BCMPB_MainReport_2004.pdf with appendices (http://www.for.gov.bc.ca/hre/bcmpb/Appendices.htm)
- Revisions and enhancements made during year 3 (resulting in BCMPB.v3): http://www.for.gov.bc.ca/hre/bcmpb/BCMPB.v3.ModelDocumentation.Update.pdf
- Revisions and enhancements made during year 4 (resulting in BCMPB.v4): http://www.for.gov.bc.ca/hre/bcmpb/BCMPB.v4.ModelDocumentation.Update.pdf

2.0 Updates to the Beetle Projection Model

2.1 Recording Pine Kill

The modeling platform used for BCMPB[1] can only accept spatial layers with integer values. This means that floating point values and calculations must be converted to integer. The method used by BCMPB to convert floating point values to integers was changed to guarantee at least some kill given some MPB attack.

2.2 Tracking Beetle History

BCMPB version 5 tracks the history of volume killed by beetles. In previous versions of BCMPB, this history was erased when logging occurred. BCMPB.v5 was changed to keep the impact history.

[1] BCMPB is developed using the Spatial Explicit Landscape Event Simulator (SELES) modeling tool, which is the product of Gowlland Technologies Ltd (http://www.Gowlland.ca).