

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

Documentation of revisions to the model resulting in BCMPB.v4

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1.0 Introduction and Purpose of this Document

Over the past four 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.v4).

- 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>

2.0 Updates to the Beetle Projection Model

2.1 New depletion information

The forest cover database¹ has not been updated to reflect much of the recent logging, so depletion information was derived separately from two sources. RESULTS² (Reporting Silviculture Updates and Land status Tracking System) is the primary source for recent logging. RESULTS captures the spatial location and date of a disturbance. Change detection, which is a secondary source for recent logging, uses Landsat satellite imagery to identify logging activity not yet accounted for in RESULTS. Unfortunately, it is not possible to determine the exact year of disturbance when the satellite images do not occur in adjacent years. Using these two sources, we believe that we capture almost all logging activity since 1999.

2.2 Net down to account for harvesting since 1999

We do not have exact information about when logging occurred for all depleted areas, but BCMPB requires us to assume some particular history. To generate logging history from depletion information, we run a modified version of the management model from 1999 to 2006. Using the volumes reported by the Harvest Billing System³ as targets, the modified management model is directed to cut only in those areas we know have been depleted. For each year from 1999 to 2005, the management model will first cut all areas RESULTS' reports being logged in that year. The management model will subsequently cut in areas identified by the satellite imagery change detection if further volume is required to meet the volumes reported by the Harvest Billing System. In 2006 of the beetle management simulation, the management model will cut all areas RESULTS' reports being logged in 2006 and all areas remaining uncut within the satellite imagery change detection.

¹ <http://www.for.gov.bc.ca/hts/vri/>

² <http://www.for.gov.bc.ca/his/results/>

³ <http://www.for.gov.bc.ca/hva/hbs/>