Provincial Level Projection of the Current Mountain Pine Beetle Outbreak

Summary of Year 1 of the Project

Funded by the Mountain Pine Beetle Initiative and the BC Forest Service

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For full documentation refer to:
http://www.for.gov.bc.ca/hre/bcmpb

Project Objective

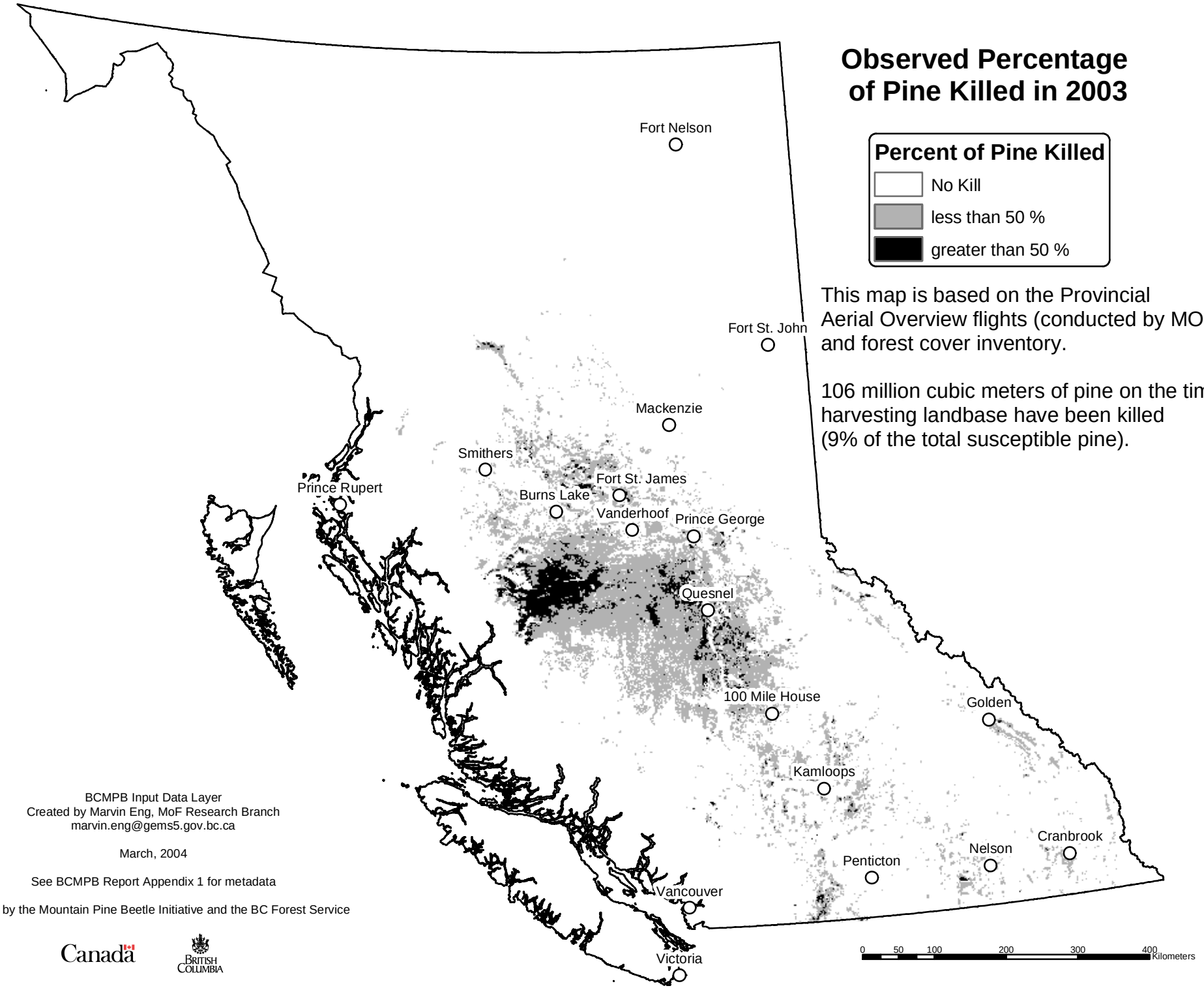
A provincial scale mountain pine beetle model (BCMPB) was developed to assess the impacts of the mountain pine beetle outbreak and associated management interactions.

Key conclusions

- The outbreak **may**:
  - last at least 10 more years.
  - kill more than 80% of the merchantable pine.

- Current (leading edge) beetle management strategies **will not**:
  - significantly slow the outbreak (provincially).
  - ameliorate timber supply impacts.

Observed Percentage of Pine Killed in 2003



This map is based on the Provincial Aerial Overview flights (conducted by MOF) and forest cover inventory.

106 million cubic meters of pine on the timber harvesting landbase have been killed (9% of the total susceptible pine).

BCMPB Input Data Layer
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See BCMPB Report Appendix 1 for metadata

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Canada

British Columbia

CONCLUSIONS ABOUT THE OUTBREAK

There is uncertainty about the future course of the outbreak but it may last at least 10 more years and may kill up to 80% of the pine

Figure 1. Cumulative Volume of Pine Killed (Worst Case Projection)

The "worst case" projection is that more than 95% of the susceptible pine volume will be killed within 20 years.

(Note that all graphs in this document provide data for the timber harvesting landbase only)

There is uncertainty in this projection. However, barring unforeseen severe weather events, we project that a minimum of 80% of the pine will be killed before the outbreak collapses.

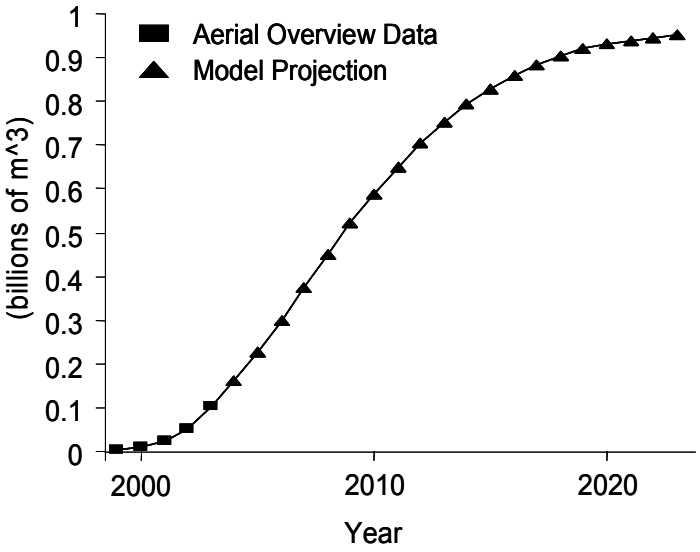
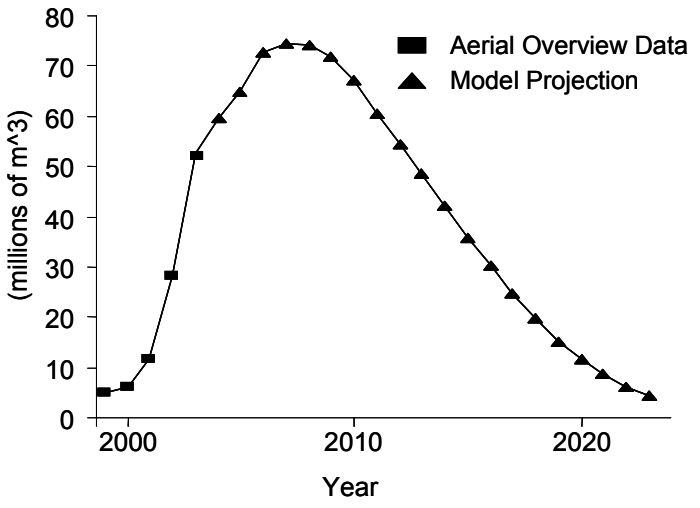


Figure 2. Annual Volume of Pine Killed (Worst Case Projection)

The peak in annual kill is expected to occur in 2008 and may more than 70 million cubic meters per year on the timber harvesting landbase.

The infestation will likely last more than another 10 years and may not subside to pre-outbreak levels until 2020.



CONCLUSIONS ABOUT BEETLE MANAGEMENT (1)

Beetle management strategies will not slow the spread of the outbreak.

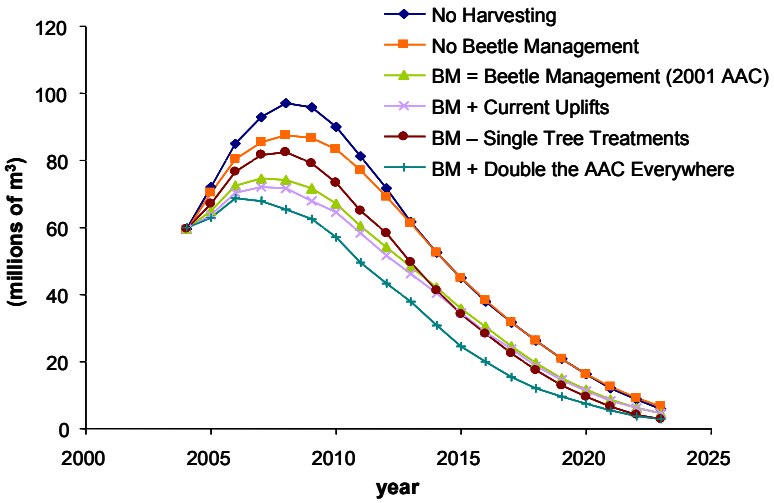
We draw conclusions about beetle management by modeling a range of management scenarios. The "No Harvesting", "No Beetle Management" and "Double the AAC" scenarios provide boundaries on the problem for comparison purposes only.

- No Harvesting
- No Beetle Management
- BM = Beetle Management (2001 AAC)
- BM + Current Uplifts
- BM – Single Tree Treatments
- BM + Double the AAC Everywhere

The "Beetle Management" (BM) scenarios use rules based on the current beetle management strategy of concentrating harvest in infected pine at the leading edge of the outbreak. We model the beetle management with the AAC as of 2001 and with the current uplifts. We also model beetle management with no single tree treatments.

Figure 3. Annual Volume of Pine Killed

If beetle management was going to slow the outbreak we would expect the peak in annual kill to occur at a later time in scenarios with more aggressive beetle management. This does not happen. In fact, the most aggressive management ("Double the AAC") results in the peak in kill occurring earlier than other scenarios.



We are not affecting the spread of the outbreak. We are only harvesting susceptible pine. The outbreak declines, without our intervention ("No Harvesting") because it runs out of pine. Our management hastens the decline by removing susceptible host, but it does not slow the spread of the outbreak.

This conclusion is applicable at a provincial scale. The model shows that suppression activities may temporarily protect forest values in some local areas where the beetle population is relatively low.

CONCLUSIONS ABOUT BEETLE MANAGEMENT (2)

Beetle management strategies will not ameliorate timber supply impacts.

Figure 4a
Cumulative Volume of Pine Killed

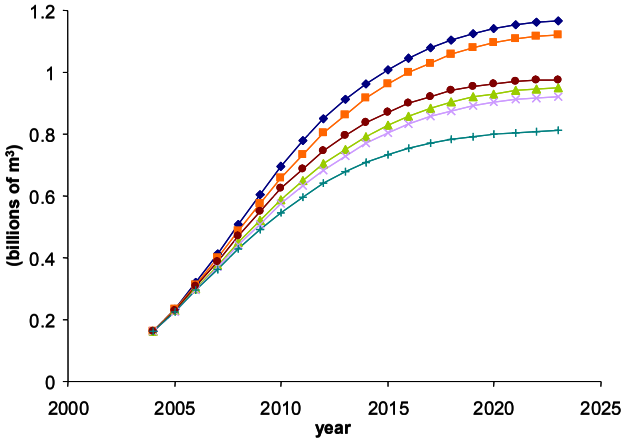


Figure 4b
Cumulative Green Pine Harvested

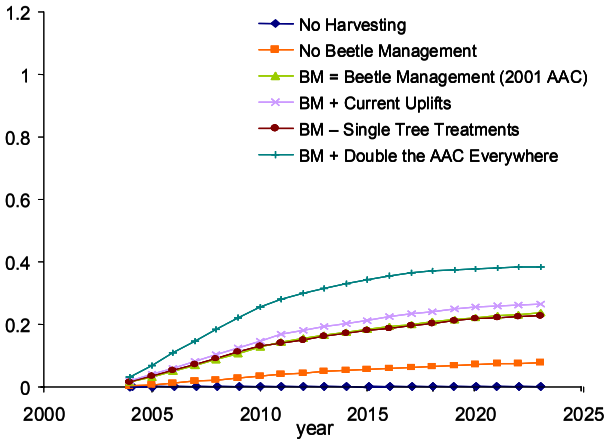


Figure 4c
Standing Volume of Green Pine

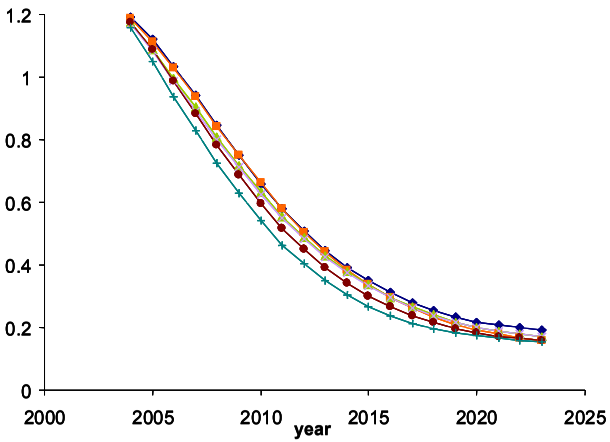


Figure 4a shows that increasingly intensive beetle management activities reduce the volume of pine that is killed by beetles.

Figure 4b shows that increasingly intensive beetle management activities increase the volume of green pine that is harvested.

Figure 4c shows that the volume of live pine at the end of the outbreak will be virtually the same regardless of the "effort" expended on beetle management. The reason is that the amount of the decrease in the volume killed is nearly identical to the amount of the increase in the volume harvested.

PROVINCIAL SCALE CONCLUSIONS

- About Beetles:
  - This outbreak is unprecedented in B.C.'s recorded history.
  - Annual kill of pine may peak in 2008 at more than 70 million m3 (on the timber harvesting landbase).
  - The outbreak may subside to pre-outbreak levels only after 2020.
  - More than 80% of the merchantable pine volume may be killed.

- About Beetle Management
  - Single tree treatments will have little effect on total volume killed but may protect specific forest values in some areas.
  - Current (leading edge) beetle management strategies **will not** significantly slow the spread of the beetle although they may temporarily protect forest values in some local areas where the beetle population is relatively low.
  - The volume of live pine at the end of the outbreak will be the same regardless of the "effort" expended on beetle management.

QUESTIONS AND ANSWERS

Does this mean that previous beetle management activities, associated with this outbreak, have been inappropriate?

No. Until recently beetle management activities have been done in the context of a much less serious infestation. The additional information provided by this study highlights the fact that the outbreak is now sufficiently large as to be unmanageable.

Should we change beetle management activities because of this information?

We are in the process of changing our beetle management in the face of the expanding outbreak. This information will be used to help guide that change. In co-operation with industry we will continue aggressive management designed to mitigate the impacts of the beetle outbreak.

What are the implications of this information for timber supply, forest economics and other forest values?

The answer to that question is not simple and is made more difficult by the continued expansion of the outbreak. The issue is being investigated by team of people from Ministry of Forests including personnel from the Forest Analysis Branch, Economics and Trade Branch and the Forest Science Program. That team is engaged with staff from the Ministries of Water Land and Air Protection and Sustainable Resource Management.