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January 6, 2005

Dr. Bruce Fraser
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Re: **Forest Practices Board Special Report "Evaluating Mountain Pine Beetle Management in British Columbia" (August 2004)**

Dear Dr. Fraser:

On behalf of the Forest Stewardship Division and Bark Beetle Coordinator's office of the B.C. Ministry of Forests, we wish to comment on the above report. Firstly, we appreciate the effort and focus that the co-authors made in making their findings and recommendations. The collaborative approach offered to ministry and industry staff in suggesting effectiveness criteria was greatly appreciated and in many respects strengthened the working relationship necessary to analyze this complex management approach. Now that our forest entomologists have had some time to digest this report, a number of technical issues have been raised. The remainder of this letter offers these technical issues for your consideration.

The report was not clear with respect to definitions for the term's "endemic", "incipient", "epidemic", "suppression" and "salvage". These terms are accurately defined in the Ministry of Forests' (MOF's) "Provincial Bark Beetle Management Technical Implementation Guidelines (Spring 2003) or Forestry Canada's mountain pine beetle (MPB) web site at: http://www.pfc.forestry.ca/entomology/mpb/outbreak/incipient_e.html. However, it appears that different definitions were used for this report. For instance, the report coined



terms such as “*transition*” and “*trailing edge*” and used these terms in the context of “*endemic*” and “*salvage*” (on pgs. 53-54). This led our entomologists to disagree with portions of the report’s conclusions.

The report’s “*trailing edge*” strategy applies to recovery of recently-dead timber within the Ministry’s “*salvage*” zones. The MOF recognizes in its *2004 Action Plan* released in April that where control is no longer feasible, salvage objectives should prevail. As such, the MOF is increasingly facilitating salvage strategies in much of the Central Interior where the objectives have gone from “suppression” to “holding” to “salvage.” However, unlike the report’s suggestion, we do not expect “*beetle management units*” (BMU’s) with salvage objectives to have any impact on controlling the beetle population. Therefore, we hold a contrary view to the Board’s statements in the report on pages 4 and 5, respectively:

“These stands (in salvage or “trailing edge” zones) may actually serve to both recover salvage volume that is relatively young (and hence still quite valuable) and to reduce MPB population levels significantly (and perhaps achieve greater population reductions than in leading edge stands that may exhibit some detectable attack, but may not yet contain large numbers of MPB)” (our underlining).

The “trailing edge strategy” “appears to have relatively high effectiveness in terms of maximizing salvage recovery and reducing MPB populations.” (our underlining).

In new salvage zones, it is not biologically possible to “*reduce populations significantly*” given the magnitude of the beetle population that resides there. While you might be able to harvest more trees containing beetle broods in salvage zones, the billions of beetles left in other adjacent unlogged trees means you achieve no real or significant impact on local beetle populations. Therefore, no net beetle control is achieved at a landscape level.

On page 13 it was stated:

“Within each EMU management zone are several Beetle Management Units (BMU’s) that are assigned one of four specific MPB management strategies.”

In actuality, emergency designations under the *Bark Beetle Regulation* are “*Aggressive*” or “*Sanitation*”. “*Emergency management units*” (EMU’s) contain only holding or suppression BMU’s. For example, an aggressive EMU contains only suppression BMU’s, not BMU’s of other strategies.

The report also stated: “*The holding strategy is applicable to chronically infested stands where the MPB population has collapsed but where there are still susceptible stands*” (our underlining). However, if a zone is chronically infested, by definition, the resident population has not collapsed. Under the Ministry of Forests’ (MOF’s) beetle management unit designations, holding BMU’s are accessible zones where larger-block sanitation harvesting is undertaken to remove 50 - 79% of infested trees.

On page 23 it was claimed that: “*To date, there has not been a test of the efficacy of the MPB management strategy, as applied on the ground, in achieving these objectives.*” For your

information, Phero Tech Inc. and Deloitte Touche conducted a detailed cost-benefit of beetle management in 2 Districts in 1993 in the modern equivalent of suppression BMU's. The analysis showed that an annual expenditure of \$4.5 million in MPB management resulted in a net benefit of \$72 million province-wide in stumpage and lumber recovery values (Miller *et al.* 1993). Even though the magnitude of the present infestation is vastly larger today, the economic analysis from this report is still valid in suppression BMU's located in areas like the Peace River and in portions of the Mackenzie, Merritt, and a few other Timber Supply Areas.

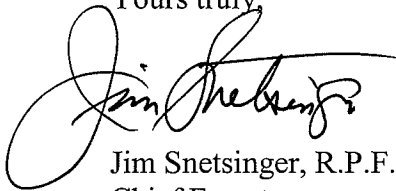
On page 32 it was claimed that "*The high level of salvage implies that such stands are capable of high production of MPB*". While new salvage zones may contain high MPB numbers, older salvage zones are seeing populations collapse because of host depletion.

It seems that the above text was not reviewed by a forest entomologist (as per the report's acknowledgements). Although we appreciate the difficulty in acquiring a qualified forest entomologist in this busy climate, we feel that the report could have greatly benefited from such a specialist's review of the draft before it was finalized. This would have facilitated a more appropriate interpretation of various documentation and suggested management approaches.

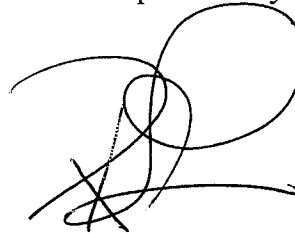
Since the release of this report, several of our staff have attempted to answer questions from various members of the public and forest practitioners about the Board's newly proposed "*trailing edge strategy*." We have been unable to provide much relevant comment in light of the concerns expressed above.

We look forward to continuing to work with you in future audits and investigations of beetle-related and other matters and we anticipate your response to these points. If you have any questions or concerns, please contact the undersigned.

Yours truly



Jim Snetsinger, R.P.F.
Chief Forester



Bob Clark
Provincial Bark Beetle Co-ordinator

c.c. R. Archibald
Regional Executive Directors
District Mangers
D. Routledge (COFI)

Reference:

A Socio-economic Analysis of Mountain Pine Beetle Management in British Columbia.
Miller, D., Carlson, J., and M. Stemeroff (1993). Phero Tech/Deloitte and Touche, 60 pg.



File : 00100-20\

February 2, 2005

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Bob Clark
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Dear Jim Snetsinger and Bob Clark:

Re: *Forest Practices Board Special Report "Evaluating Mountain Pine Beetle Management in British Columbia"* Response to MoF letter to Bruce Fraser from Jim Snetsinger and Bob Clark

Thank you for your recent letter regarding our mountain pine beetle report. This was the first response we have had from the Ministry of Forests on this report since it was released, so we welcome the feedback and the opportunity to respond to technical issues identified by ministry staff. This letter is intended to clarify the intent of the report in relation to those issues.

1. Letter page 1, paragraph 2: Definitions of terms used, in particular MPB status (endemic, incipient and epidemic) and beetle management types (suppression, salvage, trailing edge).

Our intent was to follow the same usage of MPB status terms as in the provincial bark beetle management technical implementation guidelines and by the Canadian Forest Service. On review, I didn't find any use of the terms "endemic" (populations at low levels typical of areas without growing populations) and "epidemic" that was not consistent with the CFS usage. For example, on page 9, the report says "If the infestation level within the stands is endemic, (at natural low population levels) then the MPB generally attacks trees which are physiologically weakened. Under epidemic conditions it kills healthy, vigorous trees."

The FPB report does not mention the term "incipient", and should perhaps have used this term instead of "transition". However, there is perhaps a slight distinction. Incipient populations are defined as "those that exceed a minimum size necessary to overcome the resistance of the average large diameter tree in the stand" (CFS), whereas we defined transition populations as the "threshold period when the current MPB infestation starts to exceed the harvesting/treatment capacity within an area. Transition period between endemic to epidemic translates into a significant increase in the MPB population whereby most of the MPB population is coming from outside the transition zone area." (page 53). This definition should perhaps have appeared earlier in the report, as it is first used on page 24.

We coined the term "trailing edge" as a form of beetle management strategy that hasn't been explicitly specified or applied by the ministry to date. It is a strategy that focuses on areas with several years of attack, containing substantial salvage volume as well as MPB populations. One of the key findings of our study was to show that targeting such stands has the potential of recovering high levels of salvage as well as still removing beetles. As such, it is a strategy that is useful to apply as an interim measure when MPB populations rise above levels for which leading edge suppression/holding is no longer effective, but before a full switch to only salvage.

These terms were, I feel, consistently used in our report, so I am not quite sure why a semantic dispute over definitions would lead you to state that this "led our entomologists to disagree with portions of the report's conclusions".

2. Trailing edge strategy

Currently, strategies within beetle management units switch from suppression/holding to salvage when control is no longer feasible. We see the "trailing edge" strategy as an intermediate strategy that appears to be useful. As beetle populations surpass management capacity, it may still be useful to focus management on areas with several years of attack rather than continue focus on the leading edge. That is, by focusing on areas with high recent dead wood (and MPB populations), not only is there potential to recover substantial salvage, but also to reduce MPB (albeit modestly). Our report does not suggest to apply trailing edge instead of salvage, but rather to switch to trailing edge earlier than typically has occurred. Perhaps we didn't communicate the trailing edge strategy adequately, since it implies more than just recovery of recently-dead timber in the salvage zones, as stated on the first paragraph on page 2 of the letter.

The quote mentioned in paragraph 2, page 2 of the letter (from page 4 of the report) has been taken somewhat out of context. For one thing, the letter's quote contains the text

'(in salvage or "trailing edge" zones"), which isn't in the report. The authors state "In new salvage zones, it is not biologically possible to reduce populations significantly given the magnitude of the beetle population that resides there". One objective of the analysis in this report was to assess Cheslatta and Burns Lake East landscape units over the past 6 years, as MPB populations grew from low levels to epidemic. We did not suggest that trailing edge strategies should apply in all cases, but, to the contrary, that the leading edge strategy employed in these landscape units should have switched to a trailing edge strategy sooner. This is not to imply that the MPB outbreak could have been stopped or slowed over the medium term, but rather that a trailing edge strategy is appropriate as an intermediate "fall back" strategy when it starts to become clear that leading edge management is not succeeding.

Under appropriate conditions (such as those analyzed in our report), reductions in MPB populations using a trailing edge strategy can be significant in the sense that it removes at least as many beetles as a leading edge strategy and, we believe, a greater number of beetles in many cases. Hence, we aimed to communicate that such a strategy presents a lower risk option than over-extending a leading edge strategy. Clearly all management efforts have been humbled by the degree of the current outbreak.

3. Emergency management unit zones (page 2, mid-page)
BMU's in general can have one of four strategies. If EMUs can contain only certain types of BMUs (suppression and holding), this should have been clarified.

4. Quote from report page 13: "The holding strategy is applicable to chronically infested stands where the MPB population has collapsed but where there are still susceptible stands."

I agree that this statement is not very clear.

5. Quote from report page 23: "To date, there has not been a test of the efficacy of the MPB management strategy as applied on the ground, in achieving these objectives."

This statement should have more clearly stated that there has not yet been a "landscape-scale retrospective test of the efficacy of the MPB management strategy, as has been applied, on the ground, in achieving these objectives". Furthermore, we beg to differ that the cited report by PheroTech and Deloitte Touche is a valid analysis of the efficacy of the current MPB management strategy. This report was completed in 1993, well before the current outbreak, and does not analyze conditions that are similar to the magnitude of the current beetle epidemic in the Nadina forest district.

6. Quote from report page 32: "The high level of salvage implies that such stands are capable of high production of MPB."

The letter author's state that "While new salvage zones may contain high MPB numbers, older salvage zones are seeing populations collapse because of host depletion." The quote from page 32 is taken out of context. Preceding text states that "Stands with high levels of merchantable salvage (as opposed to simply high levels of any type of salvage) coincide with stands that have a few years of consecutive attack due to the relatively rapid economic decay rate of pine for sawlog production." These statements are in reference to individual stand conditions, not salvage management zones. The intent was to explain the reason why trailing edge stands are a good target for management: because they contain lots of salvage, and this salvage also implies that the remaining live pine in such stands may be capable of generating lots of beetles.

7. The authors of the letter suggest that a forest entomologist should have reviewed the report.

In fact, the report was reviewed by Dr Terry Shore, a leading forest health scientist with the Canadian Forest Service and by Julie Castonguay, a consultant and former district beetle management specialist. Dr Shore concluded:

"I found the report to be well-written, logically organized and based on sound principles. ...I think the project that you have undertaken in these two landscape units is well-served by these models and has provided some very useful and insightful information."

8. The letter authors state that they are unable to provide relevant comments regarding questions about the "trailing edge strategy" in light of the concerns mentioned.

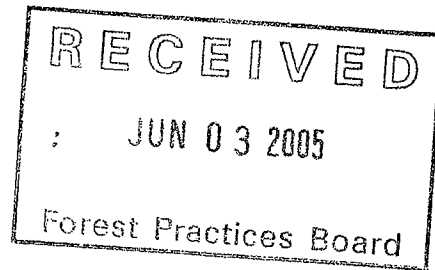
While I accept that some of the technical and terminology issues you raise could have been addressed by clarifying the text, I don't see how these issues affect the overall scientific validity of the report and the utility of the results and recommendations. It seems that most of the issues raised could be addressed with minor wording changes and clarifications.

I appreciate the detailed review that the letter's authors gave to this report.

Sincerely,



Bruce Fraser, Ph.D.
Chair, Forest Practices Board



June 2, 2005

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Dear Dr. Fraser:

Thank you for your reply to our comments of February 2, 2005, on the report titled "*Evaluating Mountain Pine Beetle Management in British Columbia.*"

I appreciate the discussion this report has raised and would like to thank the Board for providing an interesting external perspective on the current management efforts. Recent dialogue has served to clarify many of the issues raised. Upon further review, I believe that much of the Board's report is very useful and please be assured that the concepts raised will be reviewed carefully and incorporated into provincial bark beetle strategies where most appropriate.

Thank you again for the efforts made by the Forest Practices Board to provide clarity in a very complex issue.

Yours truly,

JS Jim Snetsinger, R. P. F.
Chief Forester



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