

Beetles, biodiversity and blind-ass guesses

By Fred L. Bunnell, PhD, RPBio

If anything like the current beetle outbreak happened in the past, no one recorded the consequences. Estimating the impact on biodiversity is thus a guess, but not a blind-ass guess.

We can make well-reasoned evaluations. The reasoning derives from what we do know. Here is some of what we know. . .

BC is not the stable environment of the tropics, jammed with narrow, specialized niches. Only a few thousand years ago much of BC was under ice. Many of our species show the flexible habitat requirements of recently colonizing populations.

Only three vertebrates seek lodgepole pine (caribou, three-toed woodpeckers and black-backed woodpeckers, the latter two after beetle eruption). No vertebrate is restricted to lodgepole pine, nor is any lichen or bryophyte. Even the mountain pine beetle enjoys other pine species.

In the three timber supply areas for which uplift in annual cut was first granted, about 180 terrestrial forest-dwelling vertebrates are present. About 115 of these (greater than 60 per cent) either prefer sizeable tracts of early seral forest or are generalists with respect to seral stage, provided some older structures are present.

In this same area, about 90 of the 180 species are more abundant or productive in riparian areas. These proportions are broadly representative of other areas of the province where the beetle appears to be winning the war.

Within those same timber supply areas, there are 29 species of fish, about 11 of which are sensitive to the kinds of changes that can be induced by large-scale salvage operations.

Caribou, which often change patterns of behaviour unexpectedly, are God's joke on biologists, and the impacts of mountain pine beetle and salvage operations on caribou are difficult to estimate.

Ignoring caribou, what we do know makes it relatively easy to behave in a responsible, professional manner. Some obvious approaches at the stand level

mountain pine beetle on terrestrial and aquatic vertebrates" (bookstore.cfs.nrcan.gc.ca/index.htm).

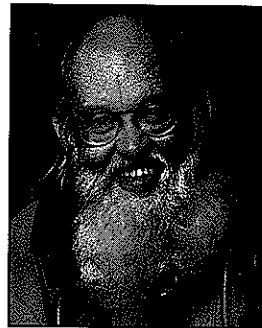
A fertile imagination can argue both ways for the caribou, especially where they are foraging on lichen mats under lodgepole pine. Harvest large tracts and the big yellow machines will destroy the lichen mats.

Leave large areas and the increased radiation

will allow shrubs to out compete lichens, then the dead pine will fall down and make the areas inaccessible. As entertaining as it would be to have a competition for the relative fertility of imagination, it probably would avail us little. To avoid any charges of cowardice, following my reasoning for all of biodiversity I come down on the side of leaving large areas.

Our real problem is unlikely to be sustaining biological diversity now.

Recommendations like those noted will go a long way to accomplishing that. Our problem is the future. There are situations where recommendations intended to sustain biological diversity may eventually work against particular components of biological diversity. For example, there are compelling reasons for planning salvage and leave areas as large blocks, including leaving entire small watersheds. That, however, may mean no roads into those areas thus little chance to introduce the desired regeneration and perhaps future difficulty in accessing fire.



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during salvage include retaining species other than lodgepole pine, controlling minor vegetation sparingly, leaving slash greater than 15 centimetres in diameter and staying out of riparian areas. At the broader scale, other recommendations are apparent. Plan both areas to be reserved from harvest and areas to be harvested as large blocks. Avoid salvage in selected areas where intermixed pine represents less than 40 per cent of the species mix. And get in and out of salvage areas quickly, deactivating new roads wherever possible. A more complete list of such reasoned recommendations can be found in the paper, "Evaluating the effects of large-scale salvage logging for

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We could have a silvicultural slum with a bleak future and reduced biodiversity.

Conversely, recommendations such as leaving species other than lodgepole pine during salvage not only benefit biodiversity, but ensure that something harvestable will be present in the future. These recommendations have a social and economic foundation as well as an ecological one.

Given that we are going where no one has ever been, it seems the only professional course is to provide our reasoned guesses transparently, plan for safe failure rather than assume fail safe, and honestly confess that we do not really know what will happen.

I have been involved in forestry education for 40 years, but I have never encountered a course in augury or foretelling. But *Forum* insisted. So, 40 years from now. . .

There will be no appreciable dent in native species richness where the bark beetle has struck. In fact, richness will be greater because geneticists will have designated some isolated fish populations as full species. Many will be pondering the wisdom of having relied on lodgepole pine regeneration. Silvicultural tours will struggle with conditions in some areas where lodgepole pine was not salvaged but has broken up in place; regeneration appears impossible and we have not figured out how to burn in winter. Some will still be arguing that the mill would still be running if the salvage had left more spruce and other species. Creative minds will contemplate the mouldering heaps that were once lodgepole pine log piles and wonder what the hell to do with them. And caribou will remain God's joke on biologists.

Fred Bunnell, PhD, RPBio, has researched forestry-wildlife relations in British Columbia for the past 40 years and published more than 200 scientific articles. He is now theoretically retired and an honorary professor in forestry at the University of British Columbia. He is happily married, a father and a Quaker, and he loves life immensely.

Strategy provides blueprint for beetle research program

By Canadian Forest Service

What will the post-epidemic world be like? "That is the question people are asking us most often about the current mountain pine beetle outbreak," says the director of the Canadian Forest Service's Mountain Pine Beetle Initiative, Bill Wilson, PhD. "We don't know the answer."

Nobody can forecast the total impact on industry, communities and other stakeholders by the mountain pine beetle infestation—estimated in 2004 to affect eight million hectares of pine forest in British Columbia, in addition to areas in Alberta—but the Canadian Forest Service is gathering the information that will enable such predictions and allow those impacts to be mitigated.

A blueprint called the epidemic risk reduction and value capture research and development strategy drives the initiative's search for answers. The strategy, developed in consultation with stakeholders, outlines an integrated plan for epidemic-related research to be funded under the \$40-million, six-year initiative. Key research areas include identifying and measuring relationships between the epidemic and ecological, economic and social environments of beetle-affected regions, and reducing risk during both the current epidemic and future infestations.

"We're building a foundation of scientifically sound information on which management and mitigation decisions can be based," says the initiative's chief implementation officer, Dave Harrison, RPF. "Instead of providing money to researchers to go charging madly off in all directions to find answers, the strategy points them directly and very specifically towards knowledge gaps that need to be filled."

With the second year of funding drawing to a close, initiative managers find that research results often pave the way for other questions within the strategy to be studied. This allows Harrison and Wilson to fine tune subsequent calls for research proposals. For example, a study evaluating effects of large-scale salvage of beetle-killed timber on forest animals identifies questions to be answered when researchers measure salvage programs for their ability to maintain non-timber forest values—questions that range from the effects of deadwood stands and salvage on terrain hydrology, to shifts in vertebrate populations as deadwood stands age or are salvaged.

The strategy also allows initiative managers to identify broader projects that will be the bases for subsequent studies. A series of field plots in three different vegetative zones in British Columbia, for instance, will provide chronosequence data for other beetle-related research projects, including assessment of residual biomass, of post-beetle ecological character and regeneration, and of merchantable lifespan of beetle-killed timber.

"The epidemic is going to affect us for a long, long time, but stakeholders need to make some decisions regarding risk now," Harrison says. "The strategy helps us to gather together the needed information efficiently and effectively to support those decisions."

For more information, visit the Mountain Pine Beetle Initiative web site (mpb.cfs.nrcan.gc.ca).