

**Taking Effective Action to Sustain and Restore
Conservation Values During and After the Cariboo
Chilcotin Mountain Pine Beetle Epidemic**

Friends of Nemaiah Valley Input

into

Development of an Effective Conservation Strategy

for the

Cariboo Chilcotin Beetle Action Coalition

Prepared by

O.R. Travers R.P.F.

O.R. Travers Forestry Consultants Inc.

February 22, 2007

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Acknowledgements

I would like to acknowledge all who assisted in providing information and insights for the preparation of this report. All opinions, and if there are any errors and omissions, are my own.

Summary

The large-scale mountain pine beetle (MPB) epidemic and the cumulative effects of a changing climate are the driving force for the creation of the multi-sector Cariboo Chilcotin Beetle Action Coalition (CCBAC). This report, commissioned by the Friends of Nemaiah Valley, provides input into the CCBAC's Conservation Strategy. Economic and social issues are more directly addressed in other strategies of the CCBAC.

This report has a solutions focus, not a problem focus. Its premise is the assertion that effective action can only occur with a transformation of the existing forest policy paradigm to the knowledge economy,

By going back to the founding values and principles of conservation, this strategy reconnects the past to the present, in order to go forward. Conservation means harmony between people and land, where both are better off in the short and long term as a result of this partnership. The ultimate end of conservation is a mutually beneficial relationship between people and land, ecologically, economically and socially. When either people or the land becomes poorer, conservation suffers.

A whole new approach is needed.

- Get the Cariboo Chilcotin land use mission right. What are the positive outcomes and impacts we really want?
- Get the diagnosis of the MPB problem right. Is the beetle epidemic a problem of simplicity? Disorganized complexity? Or organized complexity?
- Conduct a conservation needs assessment for the Cariboo Chilcotin.
- Use the Kellogg Logic model to map out the policy and program process of getting from "here" to "there".
- Get the decision making process right. Test alternatives to assess their ecological economic and social merits before decisions are made.
- Choose the most effective actions for accomplishing the mission.
- Conserve the ecological complexity, biodiversity and resiliency of Cariboo Chilcotin forests. A safe minimum standard of conservation is a pre-condition.
- Monitor, learn, and replan to incrementally produce the results we really want.

A Logic Model that describes the relationship between the resources needed (inputs) with intended results (outcomes and impacts) provides an efficient and effective thought process for enabling policy and decision makers to implement human and financial investments, incrementally over time. An effective conservation strategy will be enhanced by its use.

*“ The best way to predict the future is to create it.”
Peter Drucker*

*“To produce a healthy forest, managers need to expand their vision.”
Jay O’Laughlin et. al.*

I: Introduction

The Cariboo Chilcotin Beetle Action Coalition (CCBAC) has initiated an integrated multi sector process to help local communities prepare for the ecological, economic and social challenges being thrust upon everyone by climate change and the associated large-scale mountain pine beetle (MPB) epidemic.

The Friends of Nemaiah Valley (FONV) welcome this opportunity to provide input into the development of the CCBAC regional conservation strategy so communities can better anticipate the future and take initiatives that will assist them to survive and prosper. This document supports the FONV’s contribution to the development of this strategy. Its premise is the assertion that effective action can only occur with a transformation of the existing forest policy paradigm to the knowledge economy.

The FONV have a different perspective of the MPB epidemic in lodgepole pine forests, a different diagnosis of the consequences of the MPB on forest productivity and values, and a different view of how to take effective action required to manage these forests, than the existing policy of the Ministry of Forests and its licensees

David Williams, a director of the FONV, has stated that should an industrial scale salvage logging regime be implemented in the Brittany Triangle, “...the result will be ecosystem disruption and habitat loss. It will mean social disruption to the Nemaiah Valley community. That means a loss of community stability and social unrest in a community that is strongly resistant to intrusions into its territory without consent. This community has consistently rejected such intrusion in the form of the industrial logging model despite great pressure from the provincial government ...The Xeni Gwet’in are developing their own plans for wilderness tourism and are working on cultural tourism initiatives. Both of these will be compromised by inappropriate industrial development. ...Combined with the access resulting from logging, wilderness qualities in the area will not just be compromised – they will be destroyed.”

The FONV believe the best use for the Brittany Triangle, is that it remain in its natural state to serve as a population reservoir and a baseline for guiding the wise management of compatible human uses in suitable areas elsewhere in the Cariboo Chilcotin.

II Conservation: A Partnership Between People and Land

By going back to the founding values and principles of conservation, this strategy reconnects the past to the present, in order to go forward. Conservation means harmony between people and land, where both are better off in the short and long term as a result of this partnership. The ultimate end of conservation is a mutually beneficial relationship between people and land, ecologically, economically and socially. When either people or

the land becomes poorer, conservation suffers. Conservation means thinking in terms of community well being, as well as the long and short term.

Conservation means maintaining both land health as well as resource supply, and require the ability to discern sound from unsound land use. Conservation practices keep the land in good working order, as well as preventing over use.

Nature is the standard in forest and land conservation. The land is a very good “bookkeeper” and its condition is an accurate measure of the quality of conservation being practiced. Prudent careful management is at the heart of conservation, and is focused on maintaining the ecological health of the land as a whole. The goal is a close connection between humans and forests, by restoring resiliency, complexity, biodiversity and allowing for uncertainty – while producing commodities on the land best suited for this purpose.

III Some Differences Between Conservationists and Conventional Forest Management

There are significant differences between the conventional existing model of forest management and the conservation model. The existing model is based on maximizing resource extraction, with recent major increases in allowable cuts in response to the MPB outbreak. Its practices include large-scale road building, clear-cutting, planting, and spacing, all which create uniform age classes, homogenize the forest and narrow diversity. Conservationists believe the severity and extent of the MPB outbreak has been exacerbated by existing forest management practices, such as very effective fire suppression since 1950 that helped create large areas of older susceptible pine.

Conservationists are not surprised that a strategy of MPB control has not worked in the present outbreak, and agree with the opening statement in the 2004 Ministry of Forests Mountain Pine Beetle Action Plan Update that says, “ The pine beetle is a natural phenomenon that only sustained cold weather can stop.”¹

The best forest is what exists naturally, not some abstract ideal such as the fully regulated forest with an equal distribution of age classes. A conservation vision of natural order includes disturbances caused by fire, insect, disease and wind. Conservationists do not agree that forests must always be cut in order to save them. Conservationists agree that natural and other disturbances should continue within the historic range of natural variability. Conservationists are concerned by forests practices, which incrementally create simplified ecosystems that can become increasingly susceptible to insect and disease epidemics. Conservationists believe that forest practices will be much more effective, especially in an era of climate change, when informed by a rich historical understanding of the ecosystems being managed. Conservationists believe that existing practices do not leave enough structure intact to sustain the future forest. Forests cannot be sustainably managed by removing key structural and functional elements, which may seem superfluous, but in fact can be cumulatively critical.

¹ http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/actionplan/2004/update.pdf

- Large-scale MPB outbreaks in the Chilcotin are not new²

The forest insect and disease survey records confirm “ During the past 85 years there have been four large-scale outbreaks by the mountain pine beetle (*Dendroctonus ponderosae*) in the pine forests of British Columbia.”³ There have been epidemics in the Chilcotin reoccurring about every 40 years, with one in the 1890’s, another in the 1930’s, and another in the 1980’s.⁴ These epidemics have left a legacy of biodiversity and ecological complexity that has enriched the productivity and values of Chilcotin forests.

- An ecological perspective of forest health includes natural disturbances

Aldo Leopold, North America premier ecological forester said “Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity”.⁵ Most conservationists see natural disturbances (especially in moderation), including fires, insects, disease and wind, not as an aberration, but as nature’s way of keeping a forest healthy. Tree mortality, which opens up growing space and creates the opportunity for new forest structures, is not an indication of an unhealthy forest, but rather part of the process of forest renewal that permits the achievement of many conservation objectives. Natural disturbances are not an “external” problem that “good” forest management should eliminate. They are an intrinsic property of community dynamics necessary to maintain the productivity and health of an ecosystem.

- Dead trees are not waste in an ecosystem.

Old natural forests have often been seen as a place of decay and waste, and it is the human role to prevent waste and increase efficiency by growing a clean productive fast growing forest stand. Most conservationists see contributions of dead wood, not as waste, but as an essential addition of organic matter, especially in dry cold forests, to maintaining and restoring soil productivity, moisture storage and creating microhabitats for many plants and animals. What is output from one part of the carbon cycle becomes and input for the next part. Short-term economic efficiency, which reduces resilience, biodiversity and complexity, can mean irreversible changes in the ecosystem.

- Even aged forest management seldom mimics natural disturbances

Even if natural and human disturbances in a forest were not intrinsically different, industrial large-scale logging has surpassed in scale and intensity the pre-industrial disturbances that natural forests in the Chilcotin have survived. To the contrary, a focus on large-scale clear cuts and roads does not replace natural disturbances; they result in cumulative impacts, which simplify and homogenize a forest. It is common in the

² <http://www.pfc.forestry.ca/entomology/mpb/historical/images/mpb986.gif>

³ Taylor, S.W. and A.L. Carroll. 2003. Disturbance, Forest Age and Mountain Pine Beetle Dynamics in B.C., a Historical Perspective, Pp 41- 51 in Shore, T.L., J.E. Brooks and J.E. Stone. October 30-31, 2003. Mountain Pine Beetle Symposium: Challenges and Solutions. Natural Resources Canada

⁴ Alfaro, Rene L. et al 2003 Dendroecological Reconstruction of Mountain Pine Beetle Outbreaks in the Chilcotin Plateau of British Columbia Pp. 245- 256 in Shore, T.L., J.E. Brooks and J.E. Stone. October 30-31, 2003. Mountain Pine Beetle Symposium: Challenges and Solutions. Natural Resources Canada

⁵ Leopold, Aldo. 1949 A Sand County Almanac, and Sketches Here and There, Oxford University Press, Inc Pp 221

Chilcotin for the interaction of MPB and fire, some times on a large scale, to increase the diversity of trees in age, size, condition, structure and species composition. Clear cutting incrementally reduces this diversity, complexity and resiliency. When fast growing uniform plantations make land “efficient”, there is a risk that resiliency will be incrementally eliminated.

- Increased forest diversity increases resiliency to forest stresses

Dead wood is integral to maintaining many ecological functions including capture (input), production, cycling, storage and outputs. Ecosystem resilience is the sum of these functions.⁶ Pre-industrial disturbances in a forest occurred in a buffered, complex landscape that provided refuges for insects, soil fauna, and old growth dependent species such as fur bearing mammals, and vulnerable wildlife species such as woodland caribou and grizzly bears that require large unroaded forests to survive.

- Forest roads are not benign

Roads may be intended as benign corridors for transporting the flow of objects across the landscape. Instead they fragment the forest into remnants of its pre-industrial state, allowing access for motorized vehicles, weeds, pests and diseases to the point where the cumulative impact overwhelms the inherent natural values of the whole. Typically as road density increases, vulnerable wildlife species incrementally disappear.

- Nature functions as a whole, not separate parts

Nature is a complex community of organisms and web of interrelationships, not simply a collection of separate parts competing with each other. If light, water and soil nutrients are not immediately used, this does not mean inefficiency. What is often considered the productive part of the forest (green plants) cannot exist without the “unproductive” (decaying) part. All are part of the carbon cycle, absolutely essential to supporting all life on earth.

IV Critical Issues to be Addressed in an Effective Conservation Strategy

Conservation strategies are of three general types:⁷ (1) species protection (e.g. endangered species legislation) (2) land protection (e.g. protected areas); and (3) natural resource management (e.g. ecosystem management). The FONV focus is on type 1 and 2, with the potential to function as a baseline for type 3 conservation.

In wildlife management, a conservation strategy has been defined as “ A management plan for a species, group of species, or ecosystem that prescribes standards and guidelines that if implemented provide a high likelihood that the species, groups of species, or ecosystem, with its full complement of species and processes, will continue to exist well-distributed throughout a planning area, i.e., a viable population.”⁸

⁶ Diaz, and Apostol. 1992. Forest Landscape Analysis and Design. A Process for Developing and Implementing Land Management Objectives for Landscape Patterns. USDA Forest Service, Pacific Northwest Region, R6 ECO-TP-043-92. Pp. 2.4

⁷ Noss, Reed F. and Allen Y. Cooperrider. 1994. Saving Nature’s Legacy. Protecting and Restoring Biodiversity. Island Press. Pp. 67

⁸ Source: <http://www.streamnet.org/ped/ff/Glossary/glossaryhabitat.html>

Critical issues that must be addressed in an effective conservation strategy in the Cariboo Chilcotin, must include:

- Accommodation of First Nations aboriginal rights and title;
- Updating the Cariboo Chilcotin Land Use Plan (urgently required);
- Adaptation to climate change;
- Prescribing practices that maintain resiliency, complexity, biodiversity and the health and productivity of the whole forest;
- Returning oversight of forest planning on public lands to the Ministry of Forests and other government land management agencies;
- Promoting positive impact forest management;
- Sustainability of ecosystem patterns and processes, within the historic range of natural variability;
- Optimizing benefits and minimizing losses;
- Forest restoration;
- Reducing negative impacts of forest roads;
- Conducting triple bottom line decision-making;
- Producing social and economic benefits for dependent communities;
- Monitoring outcomes, learning and replanning;
- Transition to the knowledge economy.

V Conservation Needs Assessment

A Conservation Needs Assessment (CNA) can provide a comprehensive evaluation of the ecological condition of the Cariboo Chilcotin's forests and lands. With input and resource data from all interested parties, the CNA would take into account the condition of all ecosystems and the ongoing impacts of the principal land uses in the area. Public input and science-based information will be essential.

The CNA would serve as a starting point for making informed decisions about policies and practices for conservation programs. It can also recognize the various local, provincial, and

federal laws and regulations that may apply. The CNA will also provide the scientific basis for setting funding priorities and selection of the most effective conservation practices.

The CNA would identify the work that needs to be done to achieve conservation goals.

VI The Safe Minimum Standard of Conservation

Sustainability, irreversibility, and safe minimum standard are three terms associated with management, protection and restoration of conservation values. The concept of sustainability underlies many forest management plans. In the context of environmental restoration, sustainability means the restored ecosystem can self renew without continued intervention. If a highly altered ecosystem is in an irreversible condition, then it is unlikely to be restored. To achieve sustainability across the landscape, safeguards can be necessary to protect ecosystem integrity, to prevent damage, or to ensure sustainability. The concept of the “safe minimum standard of conservation” can help managers reduce the resultant risk and uncertainty of high impact logging practices. The safe minimum standard is defined as “...a restriction (taboo, prohibition, harvesting season), which limits the use of resources to levels that are thought to be safe, e.g. conservation of a sufficient area of habitat to ensure the continued provision of ecological functions and services, at the ecosystem level.”⁹

The basic idea of the safe minimum standard is that resource depletion (i.e. degradation) is not permitted to occur beyond a certain point, to ensure the resource is resilient enough to recover following an impact. An example is the protection of minimum escapements of fish stocks, where the catch of all fishers is restricted to ensure enough spawning fish is conserved to replenish the next cycle of fishing. The greater the risk and uncertainty, the larger the safe minimum standard of conservation must be.

VII How to Get to “There” from “Here”: Kellogg Logic Model

A logic model helps policy and decision makers think through the entire policy and planning process in the development of effective programs and practices. An example is the Kellogg Logic model.¹⁰ A logic model provides a road map describing the sequence of related events connecting the need for the planned program with the program’s desired results. This helps the policy and decision makers visualize and understand how human and financial investments can be made to effectively contribute to the intended program goals and results. A logic model describes the relationship between the resources needed (inputs) to conduct a program with the quality of the intended results (outcomes and impacts).

⁹ http://www.kbif.re.kr/chm2/glossary_keywords/S/safe_minimum_standard

¹⁰ <http://www.wkkf.org/Pubs/Tools/Evaluation/Pub3669.pdf>

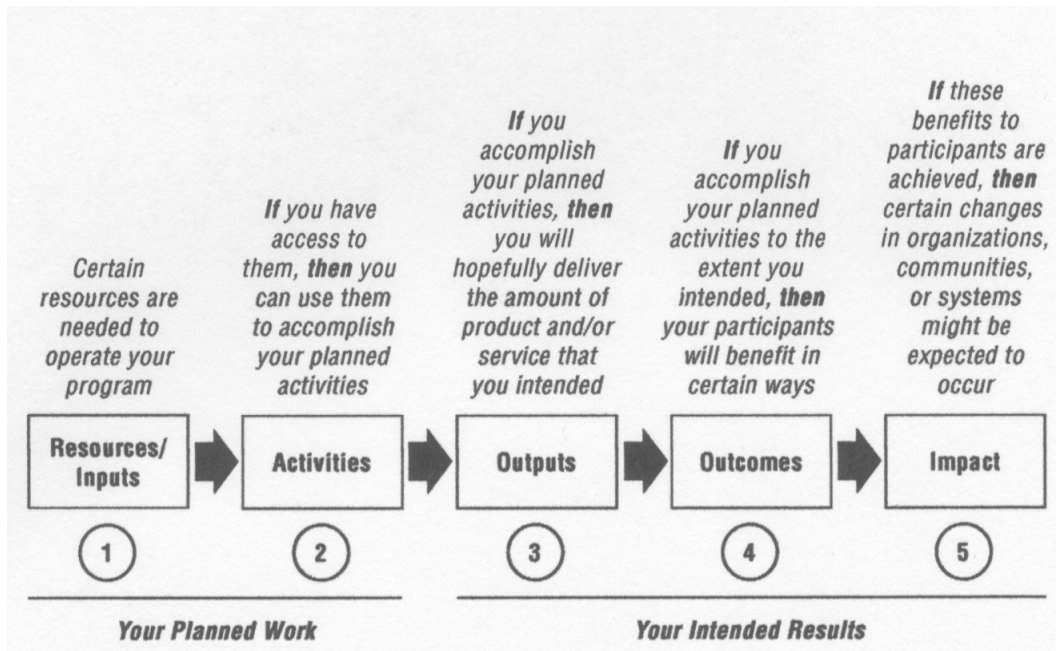


Figure 1: How to Read a Logic Model

Source: W.K. Kellogg Foundation. 2004. Logic Model Development Guide

Read this figure from left (1) to right (5). A logic model describes the program components from planning through to results. Follow the “If . . . then . . .” chain of reasoning which connects the program parts.

VIII Observations and Conclusions

- Nature is the standard for successfully managing forests and adapting to climate change;
- The current emergency large-scale salvage logging in the Cariboo Chilcotin is conserving some of the economic value of dead timber before it degrades, but it is at the expense of the short and long-term health of the land – its resilience, diversity and ecological complexity. More uniform and less diverse forests will be more vulnerable to future beetle epidemics;
- Acceptance of ongoing cumulative resource degradation as a consequence of loss of biodiversity, ecological complexity and resilience (the ability of an ecosystem to recover from disturbances) caused by large-scale salvage logging and roads is an essential precondition to development of an effective conservation strategy;
- An ecosystem is healthy when it maintains its complexity, biodiversity and resiliency. Complexity requires maintenance of the overall biodiversity of a region, by a wide array of habitats arranged in the landscape over space and time; Resiliency requires fully functioning ecological processes.
- Forest management must focus on lodgepole pine, not the MPB.

- The current forest planning and decision making process, with very limited oversight by Ministry of Forests and other government agencies, is unacceptable.
- Green up as a stewardship standard is totally inadequate.
- An effective conservation strategy will conserve the ecological complexity, biodiversity, resiliency and capacity of Cariboo Chilcotin forests to self renew.

IX Recommendations

- Get the Cariboo Chilcotin land use mission right. What are the positive outcomes and impacts we really want?
- Get the diagnosis of the MPB problem right. Is the beetle epidemic a problem of simplicity? Disorganized complexity? Or organized complexity?
- Conduct a conservation needs assessment in the Cariboo Chilcotin.
- Use the Kellogg Logic Model to map out the policy and program process of getting from “here” to “there”.
- Welcome all insights, experience, knowledge, expertise and skills to inform the decision making process (See Appendices I and II, for examples).
- Get the decision making process right. Test alternatives to assess their ecological economic and social merits before decisions are made.
- Choose the most effective actions for accomplishing the mission.
- Conserve the ecological complexity, biodiversity and resiliency of Cariboo Chilcotin forests. A safe minimum standard of conservation is a pre-condition.
- Monitor, learn, and replan to incrementally produce the results we really want.

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http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/stewardship/hydrology/index.htm

Appendix I

Definition of Terms

1. Adaptation

- To adjust to new conditions.

Source: www.methodfitness.com/fitness_glossary.shtml

- The process of making adjustments to suit the environment

Source : www.ontarioenvirothon.on.ca/Pages/Modules/Wildlife/Wdefinitions.htm

- The process of change to better conform with environmental conditions or other external stimuli.

Source: www.smu.edu/anthro/collections/glossary2.html

2. Carbon cycle

- The process by which carbon is recycled in the ecosystem.

Source: www.med.uwo.ca/ecosystemhealth/education/glossary.htm

- The process by which carbon is taken up by plants and animals and returned to the environment in a continuous cycle.

Source:

www.energex.com.au/switched_on/project_info/electricity_production_glossary.html

- The natural processes that influence the exchange of carbon (in the form of carbon dioxide, carbonates and organic compounds, etc.) among the atmosphere, ocean and terrestrial systems. Major components include photosynthesis, respiration and decay between atmospheric and terrestrial systems (approximately 100 gigatons/year); thermodynamic invasion and evasion between the ocean and atmosphere, operation of the carbon pump and mixing in the deep ocean (approximately 90 gigatons/year).

Source: www.evomarkets.com/ghg_glossary.html

3. Conservation

- Conservation is a philosophy of managing the environment in a way that does not despoil, exhaust or extinguish.

Source: Jordan, Carl F. 1995. Conservation. John Wiley and Sons, Inc. 340 Pp.

- The process or means of achieving recovery of viable populations.

Source: <http://www.streamnet.org/pub-ed/ff/Glossary/glossaryhabitat.html>

4. Stewardship

- the office, duties, and obligations of a steward
- the conducting, supervising, or managing of something; *especially*: the careful and responsible management of something entrusted to one's care *stewardship* of our natural resources.

Source: <http://www.streamnet.org/pub-ed/ff/Glossary/glossaryhabitat.html>

- Stewardship is the responsible use (including conservation) of natural resources in a way that takes full and balanced account of the interests of society, future generations, and other species, as well as of private needs, and accepts significant answerability to society.'

Source: <http://www.m-w.com/dictionary/stewardship>

5. Sustainability

- The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Source: www.umpqua-watersheds.org/glossary/gloss_s.html

- The ability of natural resources to provide ecological, economic, and social benefits for present and future generations.

Source: <https://www.uwsp.edu/natres/nres743/Glossary.htm>

- Sustainability is effectively the goal of sustainable development. It is the ideal end state which we must aspire.

Source: www.esd.rgs.org/glossarypopup.html

6. Sustainable Development

- Improving the quality of human life while living within the carrying capacity of supporting ecosystems" (Caring for the Earth, IUCN/WWF/UNEP, 1991)

Source: www.interenvironment.org/wd1intro/glossary.htm

- Forms of development that do not deplete the land or its people. Sustainable practices are ecologically sound, economically viable, socially just and culturally appropriate.

Source: www.web.net/rain/glossary.htm

- Sustainable development is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs', according to Our Common Future, a 1987 report from the UN. One of the factors which sustainable development must overcome is environmental degradation.

Source en.wikipedia.org/wiki/Sustainable_development

Appendix II
Active Canadian Forestry Service Mountain Pine Beetle Research Projects by
Strategic Initiative¹¹

Ecological Processes (1A)

Strategic Initiative: A1 - Development and delivery of decision support tools to evaluate the impacts of various MPB management scenarios on post-beetle landscapes.

Strategic Initiative: A2 - Determination of the environmental risks and opportunities associated with regeneration and ecological impacts.

Strategic Initiative: A3 - Development of stand level decision support tools to improve the ecological effectiveness of post-beetle management prescriptions.

Economic Processes (1B)

Strategic Initiative: B1 - Development and delivery of market support information on the aesthetic and performance properties of post-beetle wood.

Strategic Initiative: B2 - Development and delivery of market support information on the physical properties of post-beetle wood.

Strategic Initiative: B3 - Development and delivery of product and market support information on the chemical properties of post-beetle wood.

Social Processes (1C)

Strategic Initiative: C1 - Development and delivery of information on the potential impacts of the current beetle infestation on resource-based communities.

Reduce Future Risk (2D)

Strategic Initiative: D1 - Analyses of MPB population response across a hierarchy of scales.

Strategic Initiative: D2 - Spatial modeling of MPB populations across a hierarchy of scales.

Strategic Initiative: D3 - Enhanced tools to identify, monitor and assess response to MPB populations across forest landscapes.

¹¹ http://mpb.cfs.nrcan.gc.ca/research/projects/active_e.html