

Five Year Business Plan
Mountain Pine Beetle Ecology Program
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1. Summary

This summary document provides an overview of the Mountain Pine Beetle Ecology Program (MPBEP) direction for the next 5 year period. The Foothills Research Institute (FRI) Mountain Pine Beetle Ecology Program was born out of the Wildland Fire Research Program proposal, submitted for funding in March of 2007, to focus research and investigations in forest ecology as it is impacted by mountain pine beetle infestations. The initial funding of \$300,000 per year for a three year period (2007 to 2009), has grown as more agencies join the effort. In 2008, the Alberta Forest Research Institute committed a further \$100,000 per year for three years (2008-2010).

Established under FRI's Landscape Dynamics Theme, the research and projects conducted by this Program examine current and emerging aspects of the effects of mountain pine beetle on forest ecology and wildland fire management in the foothills and mountainous areas of Alberta.

The research and projects to be funded and their deliverables are determined on a priority basis as reviewed and recommended by the program's Activity Team, which has identified, and regularly updates a list of priorities, direction for projects and a funding strategy.

A major concern lending urgency to this research imperative is the emerging infestation of mountain pine beetle. Much uncertainty surrounds the potential impacts of mountain pine beetle on forest ecology and the related implications. Some areas of concern are fire intensity and frequency, vegetation change in unsalvaged infested stands, effects on the growth and yield of lodgepole pine, effects on ground water hydrology.

Mountain pine beetle and climate change together will have implications for forest ecology and silviculture strategies, including for example dealing with predicted increases in wildfire risk, intensity and severity. Will stands from such unprecedented fires replace themselves naturally as they have in the past or would intervention be required? How will the ecology of forest stands in these new circumstances affect decisions on silviculture strategies including the choice of species for reforestation? These questions are being asked today, and the information and data is required to populate forest management planning models. Unfortunately, little is known at this time, except that business as usual will not be the norm.

Over the next 5 years, the Activity Team has identified four objectives for the program that will guide project prioritization and selection:

- 1) Maximize the ecological integrity of the affected forest landscape
- 2) Adjust practices to minimize disturbance factors affecting the landscape
- 3) Understand and mitigate related disturbance factors such as; wildfire occurrence and intensity, hydrology changes
- 4) Plan for resource management knowing the changes to the forest ecology and landscape

2. Research Priorities and Funding:

The Mountain Pine Beetle Ecology Program of the Foothills Research Institute was established in 2007 for an initial period of three years, for program management and the funding of research that is pertinent to the priorities identified by the MPBEP Activity Team. As of autumn 2007, two projects were granted partial funding and both are underway with supplementary funding supporting their approved programs.

The following priority areas bring focus to the program and provide direction to the Activity Team in putting together work plans.

2.1 Natural disturbance and stand dynamics research, which includes the relationship of fire, pine beetle and the eventual community impacts

- Benchmarking the independent stand dynamics of both fire and pine beetle¹
- Quantifying the additive impact of fire and pine beetle on long term stand dynamics
- Include both Limber and White bark Pine studies
- Identification of species at risk impacted by fire and pine beetle
- Implications of pine beetle mortality on watershed integrity²
- Identification of wildlife species habitat, inclusive of endangered species, impacted by fire and pine beetle events
- Post beetle successional strategies¹
- Climate change implications
- Impacts to economic and social factors of affected communities
- How MPB manifests itself in Alberta and boreal forest

¹ 1, 2, 3 - Projects underway with partial MPBEP funding:

1. Monitoring and Decision Support for Forest Management in a Mountain Pine Beetle Environment – FGYA
2. Effects of Mountain Pine Beetle attack on hydrology and post-attack vegetation and hydrologic recovery in lodgepole pine forests in Alberta – U of A
3. FERIC Wildfire Operations Research Group (WFORG)

2.2 Understanding forest management implications and options associated with pine beetle infestations e.g.

- Rehabilitation of plantations
- Regeneration challenges at the landscape level
- Regeneration of harvested vs. unharvested stands and associated shrub and/or lichen persistence or regrowth. 1,2
- Climate change implications
- Silviculture and growth and yield implications 1

2.3. Quantification of the short and long-term changes to the fire regime that includes fire intensity and severity in beetle infected stands (FP Innovations FERIC WFORG focus)

- Fire fighter safety and community FireSmart protection planning requires this information in association with FP Innovations WFORG
- Radiation outputs need to be calibrated
- Safety and evacuation zones need to be redefined
- Re-development of suppression strategies in beetle infected stands with FP innovation WFORG 3
- Climate change implications

2.4 Understanding the mpb biology and impact in Alberta

- MPB population dynamics and dispersal in Alberta
 1. Climatic impacts to MPB development and distribution
 2. Control options and control impacts to other values (including prescribed burning, pheromone use, beetle proofing)
 3. MPB impacts and interactions with threatened species including whitebark pine and limber pine

3. Strategies:

The strategies are taken from the Terms of Reference to guide implementation of the priorities.

3.1 Identify research priorities for Alberta concerning forest ecology, forest fire relating to mountain pine beetle and mountain pine beetle biology

Tasks

- i. Review the inter-provincial compendium on MPB research.
- ii. Review MPB research projects being done in BC, CFS Pacific Forestry Centre and British Columbia.
- iii. Hold a work shop to identify gaps and direction.

3.2 Attract and secure funding for long term program development

Tasks

- i. Seek new funding partners through face to face meetings and presentations.
- ii. Seek out and apply on grants and open funds.

3.3 Develop a multiple partner and discipline team to set direction

Tasks

- i. Invite Partner representatives to sit on the Program Activity Team
- ii. Review Team membership regularly
- iii. Create a Terms of Reference for the Activity Team and the Program

3.4 Provide funding for directed research initiatives as well as for proposed research projects that support the priorities of the MPBEP.

Tasks

- i. Provide a project review process
- ii. Identify criteria required by proponents for support and funding
- iii. Set review dates and budgets for allocation

3.5 Produce outcomes that can and will be used by resource managers

Tasks

- i. Identify practical tools, models, data sets and processes that can be used by resource managers
- ii. Provide training and extension of products developed through our research

3.6 Integrate as many other programs of the Foothills Research Institute in the work of the MPBEP as is practical and reasonable

Tasks

- i. Hold a one day work shop with FRI Program leads
- ii. Develop a plan on integration of the various programs as indicated by the work shop

3.7 Be aware of and avoid duplication of research through communications and linkages with others engaged in MPB research

Tasks

- i. Establish a contact and exchange information with the Provincial MPB research Coordinating committee.
- ii. Establish a link/contact with the Canadian Forest Service Pacific Centre
- iii. Establish a link/contact with the British Columbia MPB Program

iv. Establish links/contacts with various Universities and research organizations

3.8 Ensure dissemination of the program activities, learnings and deliverables

Tasks

i Produce quick notes annually based on projects being carried out by the MPBEP

ii Produce two reports per year for the MPBEP and as information for the Foothills Research Institute

iii As required hold conferences, workshops and do presentations for partners and interested parties

Table 1: Strategies and Timing

Strategy	2009									2010		
	A	M	J	J	A	S	O	N	D	J	F	M
3.1 Identify research priorities for Alberta concerning forest ecology and forest fire relating to mountain pine beetle								X	X	X	X	
3.2 Attract and secure funding for long term program development	X	X	X	X	X	X	X	X	X			
3.3 Develop multiple partner and discipline team to set direction	X											
3.4 Provide funding for directed research initiatives as well as for proposed research projects that support the priorities of the MPBEP						X	X					
3.5 Produce outcomes that can and will be used by resource managers						X						X
3.6 Integrate as many of the FRI programs in the work of the MPBEP	X	X	X	X	X	X	X	X	X	X	X	X
3.7 Avoid duplication of research through linkages	X							X				
3.8 Ensure dissemination of Program activities, learnings & deliverables								X	X	X	X	

4. Present Status:

The Foothills Research Institute has conducted comprehensive research programs since 1992, looking at a broad spectrum of the elements of sustainable forest management. This research is a strong foundation upon which to build a Mountain Pine Beetle research program that looks at the impacts of Mountain Pine Beetle on sustainable forest and landscape management. Among the Themes and Programs at the Foothills Research Institute which are relevant to the MPB initiative and its current and future impacts on forest management are:

- Natural Disturbance Program and projects
 - Initial focus has been on Natural Disturbance arising from fire, but Mountain Pine Beetle is also a Natural Disturbance with implications as dramatic if not more so than fire.
 - Possible projects to link fire and mpb infestations in the natural cycle of events for Alberta
- Growth and Yield research
 - The Foothills Growth and Yield Association has a number of projects underway that may incorporate MPB impacts should such occur on the installations; also, the FGYA is currently developing a MPB research program under the Foothills MPB initiative
- Silviculture Research
 - Some research plots were installed several years ago (Navratil, Lieffers, Hayward) examining mixedwood and secondary structure silviculture strategies. These may have relevance and importance in light of current developments.
- Wildlife Research
 - The work of the Foothills Landscape Management Forum will certainly need to take MPB impacts into account as they impact caribou habitat and its implications for herd and species continuance
 - Impacts of MPB on species at risk are strongly linked to both the Grizzly Bear research program at Foothills as well as Caribou – both of which species depend to a greater or lesser degree on lodgepole pines stands at various seral stages for their habitat and security needs.
 - Research project started in 2007 “Grizzly Bear/Mountain Pine Beetle interactions: Remote sensing monitoring and modeling”
- Fisheries and Watershed Research
 - The Model Forest has a long-established watershed and fisheries research program. The MPB infestation has very important implications for both these elements of forest and landscape management. For example, the impacts of MPB on water tables and large woody debris into streams is a major concern.

A Program Lead is in place – Don Podlubny - who prepared the initial work plan and schedule through consultation with the Activity Team, Executive, Board and other shareholders and research agencies. The responsibility of the Program Lead includes project and program management, funding acquisition, and networking and collaboration with other agencies involved with such research.

An Activity Team has also been appointed to give advice and guidance to the Program Lead, to identify priorities for research and make recommendations to the Executive and Board and to assist the Program Lead with his work and priorities.

The funding granted to this point is insufficient to support all the research deemed important to this major initiative. Therefore a major role for the Program Lead, as well as project proponents, will be to seek out additional funding for their work. Two projects have been approved for partial funding and these projects are underway with additional funding attracted by the proponents.

The MPBEP has been requested – and has agreed – to serve as the Science Forum for the Provincial Mountain Pine Beetle Coordinating Committee.

5. Program Deliverables:

The over all program deliverables will provide direction to the annual work plans and will be used as to project evaluation and acceptance. These deliverables are:

- a. A five year business plan for the program that includes;
 - List and prioritization of projects
 - Secure additional funding sources
 - Communication and extension plan
 - Linkages to other FRI programs and outside agencies
 - Report on the program's activities to the FRI
- b. Provide tools to land managers to work with the mountain pine beetle problem and its relationship to forest ecology
- c. Set up a working relationship with other like minded organizations working on mountain pine beetle and its affects on the landscape and environment
- d. Produce a list of identified strategies on MPB research as it pertains to the MPBEP research themes

6. Program Support Required:

The Mountain Pine Beetle Ecology Program operates as a full program under the Foothills Research Institute. The program receives financial management, and support from Foothills Research Institute's administration team, its Geographic Information System group as well as the Communications and Extension Program. This support will be evaluated annually and adjusted as required. Where required, MPBEP resources will be utilized to supplement this support provided by the FRI.

7. Management and Administration:

Activity Team members as of November 21, 2008

Don Podlubny	Program Lead	
John Stadt	Team Member	ASRD
Keith Ebbs	Team Member	GAER
Bob Udell	Team Member	FG&YA
Richard Briand	Team Member	West Fraser Mills Ltd
Pat Wearmouth	Team Member	Weyerhaeuser Canada
Steve Otway	Team Member	Jasper National Park
Joyce Gould	Alternate	Tourism, Parks and Recreation
Kyle Clifford	Team Member	Tourism, Parks and Recreation
Dennis Quintilio	Team Member	Fire Consultant
Rob Gibb	Team Member	Talisman Energy
George Hamilton	Team Member	F&W ASRD
Steve Bradbury	Alternate	F&W ASRD
Dan Lux	Team Member	FH ASRD
Anina Hundsdoerfer	Alternate	FH ASRD
Chris Stockdale	Team Member	FRI ND
Tom Archibald	Team Member	FRI
Keith McClain	Board Liaison	FRI

The Mountain Pine Beetle Ecology Program is directed by the Activity Team which gives direction through meetings and work plan approvals to the Program Lead. The Program Lead manages the day to day operations of the MPBEP following the policies and procedures of the Foothills Research Institute. Where required, the Activity Team may set up a Scientific Advisory committee to make recommendations as to various research and process programs. The Activity Team has agreed to a terms of Reference (appendix I) and will use these as their guiding principles for the program.

8. Financial Projections:

Table 2 shows amounts and sources of funding for the MPBEP. There will be opportunities to submit proposals and acquired additional funds under the direction of the Activity Team.

Table 2. MPBEP Program Funding

Funding Source	2008	2009	2010	2011	2012
ASRD	300,000	300,000			
Open FRIAA	60,000	70,000	130,000	82,000	9,530
AFRI	100,000	100,000	100,000		
MPBEP CF	266,300	305,400	350,000	30,000	20,000
TOTALS	726,300	775,400	580,000	112,000	29,530

NOTE: The carry forwards (MPBEP CF) are only estimates with the current year being a true figure.

Budget and Schedule of Activities

Table 3. Program Funding and Activities

Activities	2008/09	2009/10	2010/2011	2011/2012	2012/2013
Program Administration	\$ 90,000	\$ 90,000	\$ 90,000	\$ 30,000	\$ 20,000
Research and Program Projects	\$563,340	\$545,790	\$490,000	\$ 82,000	\$ 9,530
Total	\$653,340	\$635,790	\$580,000	\$112,000	\$ 29,530

9. Funding Requirements and Proposals:

The Mountain Pine Beetle Ecology Program has established a project review process to evaluate all submitted and eligible proposals. The review criteria include but are not limited by:

- (a) The cost projections of the proposal must be reasonable in all the circumstances, and must not exceed the fair market value of the goods and services being provided;
- (b) The proposal must demonstrate the contribution of the activities and research to improved sustainable forest land management.

(c) The proposal must not be contrary to the objects of Foothills Research Institute, the bylaws, or the provisions of relevant regulations or legislation;

(d) The proposal, must in the opinion of MPBEP provide knowledge, data or tools that benefit resource managers in addressing the affects of mountain pine beetle infestations;

(e) The proposal must not, in the opinion of MPBEP, have a significant adverse impact on other forest resources or the environment as a whole;

(f) Favorable regard will be given to proposals which demonstrate that MPBEP funds will be utilized for the benefit of the province of Alberta;

(g) The proposal should demonstrate the applicant is able to complete the proposed project economically and efficiently. The MPBEP project reviewers may take into consideration the applicant's proximity to the location of the project, the applicant's experience in performing such projects, the availability of resources to the applicant;

(h) All matters of administration of, and accountability for, the project shall be the sole responsibility of the applicant;

(i) Applicants for project funding, along with their sponsors, will be responsible for ensuring the project is completed in accordance with the terms and conditions proposed and approved.

(j) Applicants are to demonstrate in their proposal that there is committed funding and or in-kind to a minimum of 50% of the project cost.

Presently the MPBEP has approved 2 projects;

- "Monitoring and Decision Support for Forest Management in a Mountain Pine Beetle Environment" \$157,300
- "Effects of Mountain Pine Beetle attack on hydrology and post-attack vegetation and hydrologic recovery in lodgepole pine forests in Alberta" \$210,000

Both of these projects submitted successful proposals to the Forest Resource Improvement Association of Alberta for additional funds and are underway. Additional funding will be requested through the Alberta Water Research Institute to supplement the Hydrology funds.

For operations annually the Activity Team has approved the following; \$90,000 this is to cover 120 days for the Program Lead time and travel, as well as Activity Team meeting expenses.

10. Implementation:

The MPBEP does not expect there will be any major decisions required of the board of the FRI during the term of this plan with the exception of entering into various contracts through the FRI and funded by the MPBEP. Any communications and potential influences on government policies or programs will be vetted first through the Activity Team of the MPBEP and through the FRI executive when necessary. All annual work plans are subject to FRI Board approval and the policies and procedures of the FRI.

11. Program Risk Management:

The implementation of the Mountain Pine Beetle Ecology Program will address for the partners of the Foothills Research Institute the data, knowledge and tools required to;

- a. Maximize the ecological integrity of the affected forest landscape
- b. Adjust practices to minimize disturbance factors affecting the landscape
- c. Mitigate related disturbance factors such as; wildfire occurrence and intensity, hydrology changes
- d. Better plan for resource management knowing the changes to the forest ecology and landscape

12. Conclusion:

The Mountain Pine Beetle Ecology Program is designed to look at, question and provide information, recommendations and tools in dealing with the mountain pine infestation along the Eastern slopes of Alberta, its effects on forest ecology and the strategies that will be required to regenerate and sustain forests after the infestation. These affects range from forest dynamics to hydrology and the social and economic impacts on resource based communities. This threat goes beyond the Eastern slopes and holds the potential to decimate the pine forests of Alberta and the rest of Canada. The research and processes developed through the MPEP will help mitigate this impact and increase our understanding of a pandemic infestation. All efforts and resources are to be utilized in taking proactive steps in dealing with this national issue.

This Business Plan will be updated annually to reflect on progress to date and projections for the ensuing five years.

Appendices: