

MPB Breaking News Workshop



fRI *Research*
Informing Land & Resource Management



Alberta  Government





fRI *Research*
informing land and resource management

Foothills Research Institute (fRI) is a leader in developing innovative science for land and resource management.

Mountain Pine Beetle Ecology Program

*Supporting operational decisions
and policy development*



RESEARCH PRIORITIES



Oversight provided by the MPBEP Activity Team Members

- Government (Provincial, Federal), Forest Industry

Priorities categorized by Research Themes and Critical Questions

Theme 1 MPB Biology and Management

Theme 2 Hydrological Impacts of MPB

Theme 3 Dynamics of Natural and Managed Lodgepole Pine Stands following MPB

Theme 4 Social and Economic Implications of a Changing Landscape

Research by Theme



Theme 1: MPB Biology and Management

Cold tolerance of MPB: Implications for population dynamics and spread in Canada (Bleiker, CFS)

To increase our understanding of the factors controlling spread

Development of monitoring tools to detect MPB at the edge of expansion into Saskatchewan and NWT (Erbilgin, UofA)

To field test new lures for MPB in novel habitats on expanding edge into SK and NWT.

Dynamics of endemic MPB populations in novel pine habitats (a genomic approach) (Carroll, UBC)

To determine if MPB will exist in the long term in the endemic phase in novel pine habitats, and if so, under what conditions will they erupt into the epidemic phase in the future?

Assessing the effectiveness of Alberta's forest management strategies against MPB: Part 1 (Carroll, Welham, Seely, Nelson, UBC)

To evaluate the efficacy of current direct control efforts and alternate strategies at slowing the immediate spread of MPB under changing climatic conditions

Research by Theme



Theme 1: MPB Biology and Management (cont'd)

Assessing the effectiveness of Alberta's forest management strategies against MPB: Part 2 (Carroll, Welham, Seely, Nelson, UBC)

Exploring long term implications of current and alternative MPB Strategies for ecosystem services within the context of a changing climate

**Persistence or extinction?
Quantifying the fate of invasive mountain pine beetles in eastern pine forests (Carroll, UBC)**

To determine the potential for MPB to persist following the invasion of evolutionarily naïve eastern pine forests and to assess future operational strategies for beetle control as it enters jack pine forest in eastern Alberta and Western Saskatchewan.

Simulating MPB spread management in Alberta and beyond using SpaDES (Eliot and Cooke, CFS)

To model MPB eruptive dynamics in lodgepole pine and invasive spread through jack pine by using SpaDES simulation, a leading edge modeling platform.

Research by Theme



Theme 2: Hydrological Impacts of MPB

Impacts of MPB on the hydrology and vegetation development in lodgepole pine forests of west central Alberta (Macdonald, Silins, UofA, and Anderson, fRI)

To examine the recovery of MPB impacted stands from the perspective of hydrology and vegetation after grey attack.

Extending the information from the Tri Creeks and MPB Eco-hydrology projects with hydrological modelling (Anderson, fRI)

To utilize historical hydrological data, and through enhanced modelling, determine the hydrological impacts of MPB on pine landscapes and assess prime sites for rehabilitation.

Research by Theme



Theme 3: Dynamics of Natural and Managed Lodgepole Pine Stands following MPB

Stand dynamics after MPB attack (Meredith, FGROW)	<i>To assess the impact of MPB attack on the <u>stand development</u> of lodgepole pine trees in the absence of <u>salvage</u> or <u>other management interventions</u></i>
Beyond Beetle: Natural and facilitated lodgepole pine regeneration after MPB outbreaks in Alberta (Macdonald, Liefers, Erbilgin and Flannigan, UofA)	<i>To provide <u>critical information</u> regarding the <u>potential of natural regeneration</u> following MPB outbreaks to <u>rehabilitate damaged landscapes</u>. Also, to evaluate the <u>health</u> of regeneration and identify <u>causes</u> of poor seedling health.</i>
Assessing trade-offs in food supply for two species at risk after MPB (Finnegan and Stenhouse fRI)	<i>To determine whether or not <u>rehabilitation</u> is warranted in lodgepole and jack pine stands following MPB mortality to maintain essential habitat for <u>caribou and grizzly bear</u>.</i>

Research by Theme



Theme 3: Dynamics of Natural and Managed Lodgepole Pine Stands following MPB (cont'd)

Rehabilitation of beetle-killed stands by improving pine seedling performance with mycorrhizal fungi (Karst and Erbilgin, UofA)

To enhance our understanding of what is required to increase the probability of successfully rehabilitating MPB damaged Alberta landscapes based on below ground dynamics of the interaction of mycorrhizal fungi and lodgepole pine.

Research by Theme



Theme 4: Social and Economic Implications of a Changing Landscape

Assessing community resilience to mountain pine beetle outbreaks (Parrott , UBC, Okanagan Campus)

To explore community and economic resiliency post MPB in the face of shortfall in mid term fibre supply. Measuring and determining impacts of MPB on ecological services.

Dissemination of Results



- Annual research forums
- fRI Web Site
- ***“Breaking news”*** workshops
 - Practitioners, scientists, students, community leaders, decision makers;

