

QuickNotes

Science summaries from fRI Research

Introducing: Development of fine spatial resolution tree species information for MPB-impacted ecosystems for Species-at-Risk habitat assessment

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It is well established that Mountain Pine Beetle (MPB) outbreaks cause ecological changes to pine forests which in turn have impacts on the range and abundance of key species-at-risk, specifically woodland caribou. Mountain pine beetle outbreaks change species at risk habitat by altering understory vegetation composition and changing overstory forest cover, which have cascading impacts on snow and hydrology. As a result, accurate information on the current condition of caribou habitat is critical to inform future management strategies as well as understand future risks to the species. As forest management and mitigation activities associated with the MPB continue within caribou ranges, it is critically important to understand the extent and distribution of key forest species and their associated structure (i.e. height, volume and basal area). There is a need for accurate, fine spatial scale, species information, wall to wall, across the entire caribou range in western Canada (in AB, BC and the Yukon).

Federal-Provincial MPB Research Partnership

Mountain Pine Beetle remains a severe threat to Alberta's pine forests despite the province making positive progress in controlling its spread within the province and reducing the risk to the rest of Canada.

Natural Resources Canada and Alberta Agriculture and Forestry have provided funding to a suite of projects with the goals of limiting the spread of Mountain Pine Beetle and mitigating damages where it has already invaded.



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Objectives

1. To develop high spatial resolution contemporary, accurate species predictions, for key overstory tree species found in MPB-impacted forested ecosystems (across AB, YK and BC), including individual species of pine, spruce, and deciduous.
2. Examine the availability and structural composition of the stands within caribou population ranges in Alberta.
3. Provide the resulting species layers free and open-access to managers and researchers across Canada at a spatial scale previously unavailable for caribou and MPB-management

Expected Outcomes

1. This project recognizes the importance of free and open data for decision making in Alberta around MPB impact. As a result, the predicted species layers will be publicly available and distributed through web sites.
2. We will also be providing our research results to the fRI Caribou Program and anticipate two peer-reviewed publications will result, this first on big data model development and species prediction, and the second will focus on habitat requirements of species at risk utilizing these species and structural layers. All publications will be published as Open Access to ensure the wide dissemination of the methods.
3. Code to develop these layers will be made available on a repository, for example GitHub, to allow reproduction of the results as needed in particular across other areas of Canada.

Implications for Land Management

The value proposition of producing accurate tree species maps is that such maps will allow accurate spatially explicit information on species to drive landscape plans that consider species-at-risk. The expected impact of this project therefore is large, as current maps of caribou habitat are critical in determining how to manage caribou habitat for caribou and resource extraction. By refining our understanding of where caribou habitat occurs based on tree species and stand structure, and by assessing the susceptibility of that habitat to MPB, we anticipate this research would allow modification of management plans that balance caribou habitat, timber extraction, and MPB.

Social, Economic, and Ecological Value

Accurate information on the current condition of caribou habitat is critical to inform future management strategies as well as understand future risks to the species. As forest management and mitigation activities associated with the MPB continue within caribou ranges, it is critically important to understand the extent and distribution of key forest species and their associated structure (i.e. height, volume and basal area). This information will allow tradeoffs to be made, informed by spatial data, with respect to species-at-risk management and MPB mitigation efforts, and define focused areas of mitigation and conservation activity which is currently impacted by, or susceptible to, MPB outbreak.

Expected Completion Date

August 2023