Project Number: Y072148

Contact Information

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Project Team:

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ii) Dr. Phil Burton, RPBio, Manager, Northern Projects, Pacific Forestry Centre, CFS, Prince George, BC
iii) Erin Hall, RPF, Assistant Research Silviculturist, BC Forest Service, Smithers, BC.
iv) The Bulkley Valley Centre for Natural Resources Research and Management is a not-for-profit society committed to engaging in high-quality research, which advances understanding of ecosystems in northwestern BC and their sustainable management.

Abstract:

Due to the overwhelming magnitude of the Mountain Pine Beetle (MPB) epidemic, management emphasis has shifted from efforts to control the epidemic to efforts to mitigate its impact on communities and the environment. The Allowable Annual Cut has been increased in most management units which may lead to a fall-down in timber supply in the medium to long term. It is likely that significant areas of infested forest will never be salvaged due to the large area that is impacted. Forest managers must now make decisions about which stands should be salvaged, which should be left to regenerate naturally, and which stands may require rehabilitation.

Managers are using a variety of modelling tools to assist with these decisions, to predict the long-term consequences of the beetle infestation, and to explore possible management responses to it. These modelling efforts face two barriers: incomplete data on regeneration and stand structure following Mountain Pine Beetle, and models are not available for these ecosystems to predict growth and yield in complex stands.

The mountain pine beetle outbreak is leaving residual stand structures consisting of scattered or clumped surviving lodgepole pine trees, interior spruce and subalpine fir of different sizes and ages, and patches of assorted hardwood species. As many of the heavily hit stands (especially the remote ones) will never be salvaged, the future dynamics of these stands and their ability to contribute to the timber supply is largely unknown. There is little or no data on how these complex, unmanaged stands will regenerate nor is regeneration after MPB attack well understood.

This project will prepare a comprehensive data set that describes stand structures and regeneration found following pine beetle attack, across diverse site types, from one to ten years following attack, and across several biogeoclimatic subzones in the north-central Interior. This

data will have immediate application through the analysis and description of relationships between ecosystems, stand structure, and regeneration. The data will be collected so that it can be applied in various modelling environments to improve models of regeneration, growth and yield, and timber supply. Those models are widely applied in forest management, so the impact of improved data is widespread. The data will be collected so that it can specifically be used in models that are currently being applied in the study area. Models used for Sustainable Forest Management Plans in the Lakes and Morice IFPA area can be updated with the data that is collected, with a focus on successional pathways and growth and yield. This dataset will also be used to refine tree recruitment models for use within SORTIE.

Objectives:

The overall objectives of this project are to:

1. Quantify tree seedling recruitment across the full range of stand types affected by MPB in the northern interior. Two critical factors affecting recruitment success will be assessed: abundance of parent trees and seedbed substrate favourability.
2. Develop, test and parameterize non-spatial recruitment models for MPB damaged forests that can be incorporated into stand and landscape dynamics models.
3. Determine the relative importance of long-distance versus local dispersal.

The specific objectives for the 2006/2007 year are to:

1. Based upon analysis of 1st year data, establish and measure required additional plots
2. Conduct the final data analysis
3. Complete the final report and undertake extension activities.

Linkages:

The project is not contingent on any other projects, but is closely linked and will benefit considerably from two other 2005/06 FSP projects:

a) FSP Project Y061134, Deborah Cichowski, BV Centre, "Regeneration and Stand Structure in Stands in the East Ootsa and Entiako Areas after Infestation by Mountain Pine Beetles".
b) FSP Project Y061184, Dr. Phil Burton, CFS, "Predicting Advanced Regeneration Density in Lodgepole Pine Stands in the Northern Interior of British Columbia".

Project Y061134 is providing data on regeneration from plots re-measured in 2005. Our current project and Project Y061184 are sharing data on recent and advanced regeneration.

Deliverables and Extension:

- Extension Plan

We identify three primary end user groups. First, the forest industry, government, and consulting foresters assessing the impacts of mountain pine beetle (including DFAM), preparing beetle management strategies and prioritising stands for harvest through Forest Stewardship Plans. Second, the Forests For Tomorrow Program which is preparing rehabilitation plans for MPB damaged stands. Third, the research and academic community interested in a mechanistic understanding of tree recruitment in forests. We will endeavour to make all groups aware of our work via personal contact and publications. Publications will be posted on the Bulkley Valley Research Centre website and the results will be circulated to our membership of over seventy decision makers, resource managers, and researchers. Further extension will be provided through a seminar as part of the seminar series hosted by the Bulkley Valley Centre for Natural Resources

Research and Management (audiences of between 20 and 40 per seminar). In addition, the results of the project will be provided to the annual Knowledge Transfer Session sponsored by the Morice/Lakes IFPA and be posted to the Bulkley Valley Centre for Natural Resources Research and Management web site: http://www.bvcentre.ca/. We will look for an opportunity to present results at a leading scientific conference.

- Deliverables and Activities

1. An **Extension Note**.
   - The target attendance is operational foresters preparing management plans and developing rehabilitation plans under the Forest For Tomorrow Program.
   - **Outcome**: As a result of this extension note, foresters developing plans in the northern interior will be aware of how MPB damaged stands are regenerating naturally.
2. A **Journal Paper**.
   - The target attendance is researchers interested in regeneration issues and researchers developing recruitment sub-models in stand- and landscape-scale simulation models.
   - **Outcome**: As a result of this journal paper, researchers will have a better understanding of the important processes controlling regeneration after MPB attack and will have parameter estimates for recruitment models that can be used in simulation models.
3. Presentations at **Workshops** and **Conferences**.
   - We will present results from this study at 1 to 3 workshops and conferences in BC.
   - The target audience is 100 to 500 people, drawn from the research, government, industry and consulting communities
   - **Outcome**: As a result of this extension activity the larger forestry community will be better informed about natural regeneration after MPB attack.

- Extension Partners

All extension activities will be carried out by the Bulkley Valley Centre for Natural Resources Research and Management and the BC Forest Service. The BV Centre is a member of the FORREX network of research and extension providers. As part of that network, extension notes and reports will be linked to the Natural Resources Information Network managed by FORREX.

Project Progress:

The project is proceeding well and no significant deviations or changes to the originally approved project have been required.

Schedule of work:

The following table summarizes the information presented in the accompanying Excel spreadsheet.

Activity	Start date	Completion	Estimated cost	Team member
2006/07				
Establishment and measurement of required additional plots	May 1, 2006	October 15, 2006	35,000	Hall/Summer Students
Final data analysis	September 1, 2006	February 15, 2007	21,060	Coates/Hall
Final Report writing	January 1, 2007	March 15, 2007	10,000	Hall/Coates
Extension activities	Ongoing		500	Hall/Coates
Delivery allowance			3,328	
Total			$69,888	

Budget Table:

Refer to accompanying Excel Spreadsheet.

Consultants/Contractors Table:

n/a

Fixed Assets Table:

n/a

In-kind and Cash Contributions:

n/a