Assessing the Economic Impacts of Mountain Pine Beetle Infestations in the Northern Interior of British Columbia

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Abstract

The current mountain pine beetle infestation in British Columbia has the potential to significantly impact the economy and forest-dependent communities of the northern interior. This study uses a hybrid approach in the construction of region-specific economic impact models for the Morice Lakes Innovative Forest Practices Agreement Area, the McGregor Model Forest Region, and the larger combination of the two regions. The results will also identify the impacts on the rest of the province. The hybrid approach involves the collection of secondary data to mechanically regionalize provincial data, and the collection of primary data in the form of a business survey examining economic activity to improve the regional nature of the models through a process of superior data insertion. The surveys and model construction are currently underway and the comprehensive project results will be available in the summer of 2004.

Introduction

The current mountain pine beetle infestation in the British Columbia (BC) Northern Interior Forest Region will have serious implications for the state of the economy and the affected human communities. While BC as a whole may be able to assimilate the economic impacts related to natural disturbance, concentrated regional impacts may transform small economies and thus have serious consequences for forest-dependent communities. This study seeks to identify and quantify the socio-economic impacts associated with the current mountain pine infestation in two regions of BC (the Morice-Lakes Innovative Forest Practice Agreement Area and the McGregor Model Forest Region). This study will examine the economic impacts using a general equilibrium analysis on a provincial and a regional scale.

Study Sites

The study region for this project consists of the combined area of the Morice-Lakes Innovative Forest Practices Agreement (ML IFPA) Area and the McGregor Model Forest Region (MMF) (Fig. 1). Sub-projects are also underway examining specific models for each of the two component regions. The ML

Mountain Pine Beetle Symposium: Challenges and Solutions. October 30-31, 2003, Kelowna, British Columbia. T.L. Shore, J.E. Brooks, and J.E. Stone (editors). Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre, Information Report BC-X-399, Victoria, BC. 298 p.

IFPA Area is also known as the Nadina Forest District (formerly the Lakes Forest District and the Morice Forest District). The main communities in the ML IFPA Area are Burns Lake, Houston, and Granisle. The MMF Region is comprised of the Fort St. James Forest District, the Prince George Forest District, and the Vanderhoof Forest District. The main communities in the MMF Region are Fort St. James, Fraser Lake, Prince George, and Vanderhoof.

Figure 1. Map of the project study region (dark area) within British Columbia.

Regional Economic Impact Assessment

In 2002, a project was initiated to examine the socio-economic impacts of varying natural resource management scenarios under the ML IFPA. This initial project was then expanded under the Government of Canada's Mountain Pine Beetle Initiative (MPBI) to include an assessment of the impacts of mountain pine beetle on community sustainability in the MMF. The ML IFPA project will also be expanded under the MPBI to specifically address mountain pine beetle scenarios.

General equilibrium methods are commonly applied by economists to assess the economic impacts of changes in natural resource management (Richardson 1985; Loomis 1993; Alavalapati et al. 1996, 1999; Patriquin et al. 2002, 2003a, b). The regional economic impact assessments for the study areas identified under the MPBI will each consist of a regional economic overview and a computable general equilibrium economic impact model.

Regional Economic Overview

The purpose of the regional economic overview is two-fold. First, it provides a means for compiling and reporting indicators of the state of the economy. This involves data collection from a variety of primary and secondary sources. A baseline year is selected (usually the most recent census year) and where possible, trend data is also reported. Second, the baseline data will be used to calibrate the region-specific economic impact models. Secondary data sources include the Statistics Canada 2001 Census of Population, the Statistics Canada 2001 Census of Agriculture, the 1999 British Columbia Input-output Tables, and previous research reports. Primary data is being collected through two separate surveys of local businesses, one in the ML IFPA Area and the other in the MMF Region.

In addition to asking business respondents to identify quantitative levels of business activity in the region, they were also asked a number of questions about their perceptions of the local economy and the impacts of mountain pine beetles and other natural disturbance on their business and the overall economy.

Economic Impact Modelling

The second major component of the regional economic impact assessment is the construction of region-specific impact models. General equilibrium impact models will be constructed for three regions; the ML IFPA Area, the MMF Region, and the combined area of the previous two regions. In addition, the impacts on the economy of the "rest of British Columbia" will also be examined at the provincial accounting stance. A hybrid methodology is being used to gather region-specific information to populate the computable general equilibrium (CGE) models following the methods identified in Richardson (1985) and Patriquin et al. (2002). The hybrid methodology involves a mechanical regionalization of provincial data followed by a process of superior data insertion where primary data exists. Following the literature review, the Johansen CGE structure and solution techniques have been adopted for this project (Johansen, 1974; Patriquin et al., 2003a).

Project Status

The ML IFPA sub-component of this project began in the fall of 2002. The larger assessment project was approved under the Government of Canada Mountain Pine Beetle Initiative in the spring of 2003. Previous literature for the ML IFPA was reviewed over the winter of 2002 and the British Columbia Input-output Tables were obtained and transformed into a social accounting matrix.

Sub-project 1 – the Morice Lakes Innovative Forest Practices Agreement

The ML IFPA business survey was delivered or conducted in person over the period of June 9th to June 15th, 2003. Non-respondents were contacted by telephone from July 7th to August 29th, 2003. In total, 191 (24.4%) businesses were sampled from the ML IFPA population of 782 active businesses across all major industrial sectors. There were 67 respondents and 124 refusals for an overall survey response rate of 35.1%. The population, sample, and respondents were approximately split evenly between the Lakes District and the Morice District that comprise the ML IFPA Area. Survey data entry is complete and the analysis is underway. Survey results to date have been used to construct a region-specific social accounting matrix that will be used to construct the ML IFPA computable general equilibrium model for scenario analysis.

The preliminary ML IFPA sub-project is scheduled for completion in December of 2003. A specific mountain pine beetle analysis for the ML IFPA under the Mountain Pine Beetle Initiative (including a comprehensive survey analysis) is scheduled for completion in the summer of 2004.

Sub-project 2 – the McGregor Model Forest

The MMF sub-project commenced under the Government of Canada Mountain Pine Beetle Initiative upon approval in the spring of 2003. The MMF business survey was mailed out to more than one thousand businesses on September 29th and 30th, 2003. Depending on response rate, a second survey mail out is scheduled for the end of October 2003. This sub-project and the overall study area assessment are scheduled for completion in the summer of 2004.

Acknowledgements

Michelle Spence and Nancy Leake, Canadian Forest Service, research assistants.
Project partners include the Canadian Forest Service; the Morice-Lakes Innovative Forest Practices Agreement; and the McGregor Model Forest.

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