

Project #: M085166

Assessing the effectiveness of management strategies in creating and maintaining stand-level biodiversity on large-scale mountain pine beetle cutblocks in the Arrow Boundary Forest District

Executive Summary

Assessing trends in forest ecosystems requires a thorough understanding of a benchmark or condition against which changes can be measured. Pre-harvest data, specifically timber cruise information and pre-harvest FREP data are a valuable source of baseline data, and have the potential to be used in monitoring the effectiveness of management actions taken to maintain biodiversity and other societal values during and after salvage harvesting. The objective of this study was to assess the efficacy of using these data as baseline information in FREP (Forest and Range Evaluation Program) Stand Level Biodiversity (SLB) assessments on mountain pine beetle salvage cutblocks in the Arrow Boundary Forest District.

Using three different data sources (timber cruise data, FREP pre-harvest data, and FREP post-harvest data), I conducted a pre- and post-harvest survey and evaluated trends in indicators within and across seven cutblocks. Mean densities for live and standing dead trees by diameter class, total live and dead trees, functional snags, large trees, tree species composition, and a number of qualitative indicators were analyzed.

Results indicate that there was substantial overlap between many stand structural characteristics assessed by the three methods. However, a few discrepancies were identified that could impede the use of these data as baseline information for post-harvest stand-level biodiversity assessments. Forests are dynamic, especially in the context of the mountain pine beetle epidemic, and timber cruise data are static. In addition, large trees (live, dead and live and dead combined) were evident in very small numbers in both the timber cruise and post-harvest FREP samples, but were not recorded in the pre-harvest FREP data. The number of tree species identified in FREP data was generally lower than timber cruise data, with the species absent in the FREP data generally being recorded as rare in the timber cruise. Lastly, some important stand structural attributes, such as coarse woody debris and wildlife tree classifications (i.e. ecological decay class) are not collected under the current timber cruise protocol.

This research has identified some possible limitations of using timber cruise statistics and other pre-harvest information as baseline information for FREP Stand Level Biodiversity monitoring. Rare forest elements may be misrepresented in both timber cruise and FREP samples, and some potentially valuable data are currently missing from timber cruise statistics. However, the opportunities that timber cruise data provide as a provincial

baseline dataset are immense, and further exploration and study could identify ways to improve the compatibility, efficiency, and utility of these data in FREP Stand Level Biodiversity monitoring.

This project represents one snapshot in time of stand structure prior to and after salvage logging on mountain pine beetle cutblocks in the Arrow Boundary Forest District. The results are only applicable to mountain pine beetle cutblocks with stand structure characteristics similar to these seven cutblocks. Consequently, replication across ecosystems, both that have been impacted by the recent outbreak and those that have not, is necessary before inferences can be extended to other areas. Even with the limitations discussed, timber cruise data are available for all cutblocks that are being harvested, and should be taken advantage of as baseline information when assessing whether we are effectively maintaining forest values, including stand-level biodiversity.

This project was a two year project which started in April 2006. The Forest Investment Account Forest Science Program, the Ministry of Forests and Range, the Ministry of Environment, and the University of British Columbia all contributed funding to this project.

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