

Effects of Forest Fires and Forest Management Practices on Genetic Diversity in White Spruce in Northern Alberta

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Theme: Tree Genetics

Status: Continuing

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Participants

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Background

Forest management practices relying on forest harvesting and natural and/or artificial regeneration systems, and natural disturbances such as forest fires may significantly impact genetic diversity and biological processes controlling genetic diversity in residual and subsequent forest populations. White spruce (*Picea glauca*) is naturally as well as artificially regenerated in Alberta, and generally regenerates well after forest fires. For effective sustainable management and conservation of white spruce genetic resources, and implementation of CSA criteria and indicators for registration, certification and audit of sustainable forest management, it is essential to determine the amount and pattern of genetic diversity inherent in natural populations, and to determine the comparative effects of forest fires and forest harvesting practices on genetic diversity of the post-fire and post-logged residual and regenerated stands.

Objectives

1) To determine genetic diversity of white spruce populations/stands as they occur in northern Alberta at the EMEND project sites in conifer-dominated and mixed-wood forest types in: (a) pristine mature/old-growth stands, (b) post-logged naturally-regenerated populations in blocks harvested under different harvesting intensities, and (c) post-fire naturally-regenerated populations in blocks burnt under different fire intensities.

2) To gain an understanding of the impacts of forest harvesting and forest fires of different intensities on genetic diversity in regenerated white spruce forests.

3) To generate benchmark information for genetically-sustainable forest management practices, future monitoring of genetic diversity and developing genetic biodiversity indicators, criteria and guidelines for sustainable management of white spruce forest genetic resources.

Key Results