

Executive Summary:

Implementing Climate Change Adaptation in Prince George, BC

Volume 3: Forests

The City of Prince George is the largest city in northern British Columbia and has a long history tied to forestry. Although the local economy is becoming increasingly diversified, 28% of the city's income is dependent on the forest industry, which also represents 22.1% of the total revenue for the region. Natural forests, greenbelts, and landscaped areas (such as parks) represent over 65% of the land within the Prince George city limits and are central to the identity and well-being of Prince George residents.

The vulnerabilities of Prince George's natural forests, greenbelts and landscaped areas, as well as the forests in the surrounding region, have been realized in recent years with the outbreak of the mountain pine beetle (MPB; *Dendroctonus ponderosae*). From 2001 to 2007, the City salvage harvested the equivalent of 733 logging truck loads of MPB-affected lodgepole pine from within the city limits. Forest management practices that have increased the amount of mature lodgepole pine in forest stands (notably fire suppression and planting pine monocultures) and warmer than average winter temperatures are considered the main contributing factors to the MPB epidemic. Between 1918 and 2006, Prince George's mean annual temperature has increased by 1.3°C, and the annual minimum temperature has warmed even more, rising by 2.3°C. Prince George temperatures are projected to increase an additional 2.2–3.7°C by the 2080s and precipitation is predicted to increase 6–15% annually.

Extreme events, such as wildfires, windstorms, and extreme precipitation events, are also predicted to increase in the region. Wildfires have already increased in part due to the additional fuel load caused the MPB-killed trees. Fires have caused significant air quality problems in Prince George in recent years, representing a major potential risk for the city. Projected changes in temperature and precipitation may lead to increased evaporation rates in the summer months, which can reduce soil moisture and stress trees. These impacts may lead to changes in species suitability for the environment and the introduction of new species, pests and diseases, impacting the health of individual tree species and the health and productivity of the forest ecosystem.

Over the last decade, the City of Prince George has been adapting its forest management and operations to the changing climate. Many strategies for Prince George's forested areas have been primarily focused on reducing the risks of wildfires. These include the following initiatives:

- Developing a Community Wildfire Protection Plan for natural forested areas, focusing on public education on how to reduce wildfire hazards, implementing guidelines for new developments, and identifying fire hazard areas for abatement operations
- Developing and implementing a Fuel Management Program to manage local fire hazards primarily related to the MPB within the municipal boundary
- Managing Crown natural forest land within the municipal boundary through a Community Forest Agreement and exploring opportunities to expand and diversify the community forest to extend to wildfire hazard areas outside of the municipal boundary

The City has also been undertaking many management strategies that will allow landscaped areas to be more resilient to the uncertain future climate. Some examples of these strategies include:

- Selecting and recommending more pest-tolerant species for new plantings in parks, streets, and new developments
- Planting a variety of tree species in landscaped areas rather than a single species to avoid losing all trees to a single pest like the MPB
- Introducing tree species that traditionally grow in warmer and/or wetter climates
- Creating inventories and databases to aid in monitoring species health and reduce impacts of potential pest and disease outbreaks

Although Prince George has led the way in addressing the challenge of climate change impacts on forests, there are many more opportunities for Prince George to continue to plan for climate change. Opportunities to further adaptation efforts related to natural forests, greenbelts, and landscaped areas include:

- Incorporating climate change impacts and adaptation into public documents and resources to create more community awareness of the importance of adaptation
- Discussing information needs and further modelling requirements that will inform adaptation strategies for future forest management
- Identifying key linkages and partnerships with other levels of government as well as industry to help develop policies and management objectives regarding climate change adaptation and forest management
- Developing more opportunities for planting pest-tolerant and diverse species to better prepare for the uncertain future climate
- Conducting seminars and workshops with local tree nursery professionals, tree experts, and arborists to create awareness and to gather data on potential stresses to trees and the arrival of pests and diseases that may impact tree health
- Increasing public education of current forest management by partnering with local post-secondary educational institutions to educate students (e.g. natural resource management students) on the impacts of climate change to Prince George's forests and how management has been adapted to these impacts

Together, these adaptation strategies may enable the City to minimize negative impacts from climate change while providing opportunities to take advantage of some possible benefits associated with the changing climate. These strategies may be used as guidelines for resource managers and decision makers in communities similar to Prince George, where forests and forestry are important to the livelihoods of the community residents.