



Mid-Term Timber Supply

June 14, 2012

Climate Change Impacts on Resource Values

State of Knowledge:

- In 2012 B.C.'s Future Forest Ecosystems Scientific Council will complete a \$5.1 million research initiative that assesses climate change risks to forests and seeks ways to enhance resilience.
- Information is available on the vulnerability of resource values to climate change in most regions of the province, including the Cariboo-Chilcotin, north central, northwest, southern interior, Kootenays, and the coast.
- Much is known about the potential impacts of climate change on tree species, natural disturbance regimes (fire, insects, disease, drought), biodiversity, hydrology, fisheries, terrain, soils, forage, and invasive species.¹
- Modelling has been done in the Quesnel timber supply area to incorporate effects of climate change on forest productivity of dominant tree species and on expected changes to ecosystems and species.
- Important questions remain, including for example how wildfires and forest insects will interact with climatic effects, how reduced snow-pack will affect water availability, and how forest practices can be adjusted to mitigate stream flow issues and mitigate potential disturbances from pests and wildfire.
- A diversity of tree species, age classes, and stand structure can enhance the resilience of forests, and contribute to biodiversity, seed production, habitat values, riparian protection, water regulation and long term timber supply.

Current condition:

- Climate change is already impacting B.C. ecosystems, and impacts are expected to accelerate over time.
- Many species rely for at least part of their life cycle on habitat conditions associated with mature forests. In some parts of the province, these mature forests have been under increasing pressure due to insect attack and salvage harvesting.
- Extensive beetle damage and accelerated logging in some areas have reduced the potential for seed collections from mature wild stands.

Sustainability Risks:

- A changing climate in British Columbia is expected to have many important effects on watershed processes that in turn will affect values such as water quality, water supplies, slope stability, and terrestrial and aquatic habitats.²
- In the Interior, there is increased risk of damage to tree species from forest insects and pathogens³.

¹ K. Weese (PC 2012)

² Pike et al (2010)

³ Haeussler et al (2012) unpub.

- There is evidence that tree species diversity is declining in some timber supply areas, and that age class distribution is uneven and trending toward younger ages. Both of these trends are not favourable for resilient forests.
- Questions remain about the adequacy of future supplies of tree seed to deal with climate change impacts and assisted migration (planting trees in different climatic zones). This is of particular note for species and seed provenances (specific areas where seed is collected from for desired species) that will be in greatest demand, and where intermittent seed crops and extreme weather may limit seed supply.
- Biodiversity concerns associated with forest harvesting under a changing climate include (a) the loss of old forest habitat and connectivity even in reserves due to increased tree mortality; (b) loss of suitable soil conditions for variety of organisms on exposed, dry sites; (c) loss of forest vigour, species and structural diversity; and (d) faster spread of invasive species⁴
- Cumulative environmental stress results in increasing uncertainty and deterioration in ecosystem services that humans have come to expect, including the provision of a reliable supply of clean water from streams, a steady flow of timber from healthy forests, and nutritious forage for livestock and wildlife from healthy rangelands⁵.

SUPPORTING DOCUMENTS:

Campbell et al. 2009. Ecological resilience and complexity: a theoretical framework for understanding and managing British Columbia's forest ecosystems in a changing climate. BC MFLNR 2009.
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Pike et al. . 2012. Climate Change Effects on Watershed Processes in British Columbia Chapter 19 in Compendium of forest hydrology and geomorphology in British Columbia.
http://www.for.gov.bc.ca/hfd/pubs/docs/Lmh/Lmh66/Lmh66_ch19.pdf

BC MFLNRO. Future Forest Ecosystems Scientific Council Summary of FFESC climate change adaptation research projects <http://www.for.gov.bc.ca/ftp/hfp/external/.../ffesc/FFESCprojects110104.doc>

Haeussler et al. 2012. Informing Adaptation of British Columbia's Forest and Range Management Framework to Anticipated Effects of Climate Change: A Synthesis of Research and Policy Recommendations. FFESC. (Unpublished Draft June 7, 2012)

⁴ Daust and Morgan 2011, in Haussler et al (2012) unpub.

⁵ Haeussler et al (2012).