

Climate-Informed Investments for Forest Enhancement and Carbon

Information Note #1 Best Practices for Climate Adapted Tree Species Selection

October 26, 2017

Introduction

The current distributions of tree species in British Columbia are in part associated with regional climate. As the climate changes rapidly, it outpaces adaptations in plant physiology and the pace of species range expansion. The result in many cases is the maladaptation of tree species to local climate and/or site conditions. Forest management has the potential to mitigate potential losses to maladaptation of tree species, if forests are regenerated to tree species which are adapted to current and future climates.

Purpose

Best practices for climate adapted tree species selection are necessary to support the resilience of future forests to changes in climate.

Objectives

Proposals reflect beneficial practices when they help meet the following objectives:

1. Stands are resilient to climate change as a result of tree species selection decisions;
2. Uncertainty about future climate is addressed through tree species diversity; and,
3. Climate extremes that may potentially affect climate adapted tree species (e.g., frost, drought) are mitigated through harvesting and site preparation activities.

Strategic, Operational and Tactical Approaches

Proposals reflect beneficial practices when the following are incorporated:

Strategic Approaches

- Use the [FRPA tests for approval of stocking standards](#) to guide decision making;
- Refer to the [Updates to Reference Guide for FDP Stocking Standards \(2014\): Climate-change Related Stocking Standards](#) and the [Chief Forester's memo on assisted migration for western larch](#), for tree species selection;
- Consider the range of possible future climates and select tree species that reflect the spectrum probable futures;
- Undertake tree species selection in tandem with Climate Based Seed Transfer (CBST), to ensure climatically adapted seed sources are used (*See Info Sheet #1 – Seed Use in a Changing Climate*);
- Evaluate landscape-scale tree species diversity using the Shannon Diversity Index. Identify areas where diversity is low, practices that lower diversity, and harvest and reforestation strategies to increase diversity;
- Plan to prioritize harvest scheduling where diversity can be increased;
- Plan for a variety of silvicultural systems to provide a wider range of regeneration habitats beyond those provided by clearcuts, that are suitable for greater diversity of tree species;
- Integrate climate adapted tree species selection with silvicultural systems to optimize opportunities for adaptation; and,
- To enhance diversity and resilience, use [mixed species guidance](#) (originally developed for the Forests For Tomorrow (FFT) program).

Operational and Tactical Practices

- Plan regeneration around any mitigating elements remnant in the stand (e.g., residual structure) particularly where this may help tree species selected for climate adaptation to survive potential climate or site extremes (e.g., early and late season frost, drought);
- Implement climate adapted species selection with other stocking approaches, like stocking density, to address concerns about tree species suitability; and,
- Plant a mixture of preferred and acceptable species on a block.

Cumulative Effects and Potential Impacts on Other Values

- Forest health issues interact with climate change; consider the strategies raised by the Chief Forester in the memo, [*Consideration of Climate Change When Addressing Long-Term Forest Health in Stocking Standards*](#) and [*Guidance for Assessing FSP Stocking Standards Alignment with Addressing Immediate and Long-term Forest Health Issues \(2012\)*](#);
- Consider known, existing plantation issues in the location where reforestation is planned; (e.g., presence of rusts), and ensure proposed projects address known issues through tree species selection, where appropriate;
- Consider wildlife habitat values;
- Consider landscape level issues (see Info Sheet #5 Best Practices to meet landscape level objectives and non-timber values Best Practices Info Sheet); and,
- Consider other resource value objectives contained in Higher Level Plans and Land Use Orders.

Additional Resources

- FLNRORD Stocking Standards website:
https://www.for.gov.bc.ca/hfp/silviculture/stocking_stds.htm
- Tree Species Selection Tool (a web compendium):
<http://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/tree-species-selection/tool-introduction>
- Climate Change Adaptation Strategies for tree species selection:
<http://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/silviculture/tree-species-selection/tool-introduction/climate-change-adaptation>

Contacts

Pamela Dykstra, Research Leader, Forest Ecology Interpretations, Resource Practices Branch, BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)

Email Pamela.Dykstra@gov.bc.ca Tel. (250) 387-5676.

Caren Dymond, Forest Carbon and Climate Change Researcher, Climate Change and Integrated Planning Branch, Office of the Chief Forester, FLNRORD

Email Caren.Dymond@gov.bc.ca Tel. (778) 747-2727