Transitioning British Columbia To Climate Based Seed Transfer

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

CBST Impacts, Risks and Opportunities

Information Bulletin 4 **July 2019**

In This Issue

*The Ministry of Forests, Lands, Natural Resource Operations and Rural Development Forest Improvement and Research Management Branch is leading the development of a Climate Based Seed Transfer (CBST) system to support forest ecosystem resilience, health, and productivity in a changing climate. On **April 5, 2018** amendments to the Chief Forester's Standards for Seed Use were published to allow the option to use CBST on Crown land reforestation.[1] A minimum of 2 to 3 years is currently anticipated for full transition to CBST.*

How far will seed be moved (migrated) in BC?

The actual distance that seed will be moved (migrated) in British Columbia varies for each tree species and seed source. For a detailed description of CBST Areas of Use by tree species, see: **"CBST Areas of Use for British Columbia"** posted on the Chief Forester's Standards for Seed Use website listed in the sidebar on the next page. It is important to note that the CBST project team is working closely with Resource Practices Branch to ensure that as species [ranges] shift across the landscape there will be climatically-suitable species selection and stocking standards available to support CBST.

Planting trees with seed adapted to warmer climates

Most seedlings are currently being planted on sites (cutblocks) with climates that are on average **1.2° C warmer than the** seedling's origin. This outcome has resulted in an "adaptation lag" in BC's forests in that the climate of the seedling's origin matches those of the industrial revolution rather than the climate of today or those of the near future.[1] To address this situation CBST matches seed (seedlings) with cutblock climates projected **a quarter of a rotation into the future.** This approach ensures seedlings are able to withstand the tough conditions of the early establishment years, while also giving them a better chance in adapting to a warming climate. The risk of mortality at planting using CBST is expected to be lower than the risk of mortality at planting under geographically based seed transfer policy.

Assessment of CBST Impacts and Gaps

Moving from our current seed transfer system to CBST will, in some cases, result in mismatches in seed inventories and seed orchard production capacity

[1] On **April 9, 2019**, further amendments were published including minor changes for some species (expansion of CBST Areas of Use).

For more information on CBST:

Climate Based Seed Transfer: www.gov.bc.ca/climatebasedseedtransfer

Chief Forester's Standards for Seed Use: https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/tree-seed/legislation-standards/chief-forester-s-standards-for-seed-use

For more general information:

BC Government, Forest Improvement and Research Management Branch: Tree Seed https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/tree-seed

FORHTIP.SEEDHELP@gov.bc.ca

with seed plans and operational seed needs. The Forest Improvement and Research Management Branch (FIRM) will be considering different approaches and transition options to minimize impacts on clients and stakeholders while maintaining acceptable risk to meeting regeneration obligations and future timber supply. This includes the assessment of **CBST impacts and gaps** at multiple scales (Provincial, Management Unit) by species and BEC variant for both orchard and natural stand seed sources.

How will Adaptation Trials inform Mitigation of Regeneration Risks?

The science behind CBST is based on extensive provenance and adaptation trials that, together with climate science and modelling tools (ClimateBC, Random Forest), allow for temporal as well as spatial adjustments to support the matching of seed to the near future climates of their planting sites. Results from the multi-species **Assisted Migration Adaptation Trail (AMAT)** will guide and inform changes to CBST, including the establishment of genetic suitability thresholds as we move forward in time.[2]

Balancing regeneration risk with productivity risk

Doing nothing about climate change is high risk. CBST is an adaptation strategy and tool for use in a forestry context – to reduce the risk associated with climate change impacts. CBST takes a conservative approach – focusing on **catching up with climate change observed to date**, rather than projecting too far into the future – this is intended to balance establishment risk with the risk of maladaptation and loss of productivity.

Licensees are responsible for stand establishment including plantations lost due to mortality and/or poor performance.[3] The need for legislation and policy to be revisited through the lens of **climate change adaptation** will likely increase as natural disturbance events (e.g. wildfire, forest health) and extreme weather events continue to be more widespread; and, as adaptation measures become more available. The same extreme weather events apply to the use of either a geographically-based or climate based seed transfer.

New opportunities under CBST

As we transition BC from a geographically based seed transfer system to one based on climate, increased opportunities are expected for seed use (selection and transfer). These new opportunities will allow for greater flexibility in seed use through **broader seed deployment** (i.e., for many species/seed sources and seed/vegetative lots, deployment areas will encompass much larger areas) as well as increased access to more (including new) seed sources. CBST as a climate change adaptation strategy and tool may also provide early indication of transitional areas likely to shift to novel climates and plant assemblages where the likelihood of limited or no seed is high (e.g. those areas at the leading/trailing edges of tree species ranges).

[2] AMAT comprises 48 sites across western North America.

[3] In 2008, the Forest Planning and Practices Regulation was amended to include FRPAs 97.1 (declaration regarding free growing stand obligations met to the extent practicable). This was intended for those situations that were outside of the control of the obligation and agreement holder or due to unforeseeable events that [meant] the FG obligation could not be fully met as outlined in the stocking standards."