



Transitioning British Columbia To Climate Based Seed Transfer

CBST and Assisted Migration

Information Bulletin 2

July 2019

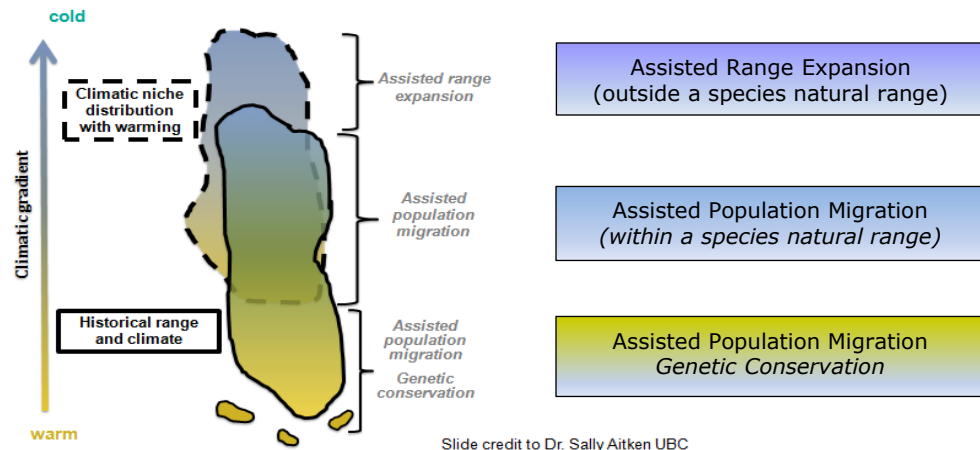
In This Issue

- Assisted migration explained
- Assisted Migration within the context of CBST
- CBST and Adaptation Lag
- CBST and species range expansion
- Assisted Migration Adaptation Trials (AMAT)

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 Implementation of CBST is phased (incremental) with a minimum of 2 to 3 years anticipated for full transition to CBST.

Assisted migration explained

Climate Based Seed Transfer (CBST) is a science-based methodology and framework that uses climate variables to match seed sources (seed and vegetative lots) to climatically suitable planting sites. CBST in BC² also includes the use of **assisted migration (AM)** as a climate change adaptation strategy. The AM used under CBST accounts for both historical climate change (commonly referred to adaptation lag) and future climate change. Assisted range expansion and population migration (within a range) span historical and future climate envelopes (Figure 1).



Slide credit to Dr. Sally Aitken UBC

Figure 1: Schematic of assisted range expansion and population migration across historical and future climate envelopes. Source: Dr. Sally Aitken, UBC

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

² O’Neill G, Wang, T, Ukrainetz N, et al. 2017. *A proposed climate-based seed transfer system for British Columbia*. Prov. B.C., Victoria, B.C. Tech. Report 099. www.for.gov.bc.ca/hfd/pubs/Docs/Tr/tr099.htm

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>
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Assisted Migration within the context of CBST

Assisted migration is the practice of helping a plant or animal move to a different place. Within the context of CBST, assisted migration is the deliberate movement of tree species and seeds/seedlings to planting sites that will be most suited to them in predicted future climates. The goal of this strategy is to maintain the health and productivity of planted forests in a changing climate, given the expectation that local climate on some sites is currently, or may, in the near future become, poorly suited to local seed.

CBST and Adaptation Lag

As the climate changes, a time lag can develop in the capacity of trees to adapt. Therefore, CBST is primarily designed to catch up with past climate change (1940s – 2016) or "**adaptation lag**". Whereas, future climate change is projected forward only 15 years on the coast and 20 years in the interior (a representative quarter harvest age rotation). This conservative approach is aimed at balancing the need for adaptation (in a changing climate) without compromising plantation establishment. This quarter rotation adjustment will be updated as we move forward in time. In addition, CBST foundational and baseline data sets (transfer functions, BEC, Climate BC) will be updated as new information becomes available.

CBST and Species Range Expansion

AM is comprised of two distinctive components: assisted population migration (seeds are moved within the current, known range of the species), and **assisted range migration** (seeds are moved beyond the current, known range of the species). Under the current legislative framework, CBST can identify seed sources for those species that are moving beyond their current range. However, the Resource Practices Branch, through the climate-informed tree species selection project, is responsible for determining what species will be acceptable in those areas.³

Assisted Migration Adaptation Trial (AMAT) and CBST

The **AMAT** seeks to better understand the growth and health of reforestation seed sources from BC and north western United States when planted across a range of climates and latitudes. This information will be used to identify species and seed sources best adapted to future climates of planting sites, in order to maintain healthy productive plantations. The Forest Improvement and Research Management Branch (FIRM) is currently analyzing the first measurements (5 year). AMAT is in its early stages with 5, 10, and 15 year measurements planned. It is anticipated that AMAT results will be incorporated into CBST as new information becomes available.



³ In the interim, see the Reference Guide for Forest Development Stocking Standards (updated March, 2019).