



# Transitioning British Columbia To Climate Based Seed Transfer



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

## What is Climate Based Seed Transfer?

Information Bulletin 1

July 2019

### In This Issue

- Seed transfer explained
- Why a new seed transfer system is needed
- What is Climate Based Seed Transfer (CBST)?
- Assisted Migration and CBST
- Migration Distance

*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.<sup>1</sup> Implementation of CBST is phased (incremental) with a minimum of 2 to 3 years currently anticipated for full transition to CBST.*

### Seed Transfer explained

**Seed transfer** is one of the foundation tools used in reforestation practices to ensure that trees planted are genetically adapted to the environment in which they grow. This is fundamental in meeting reforestation objectives and sustainable for management in BC. **Seed transfer policy** is a formal mechanism used to support seed movement to reduce the risk of poor adaptation in regenerating stock to the climate and conditions of its planting site.

### Why a new Seed Transfer System is needed

The current **geographically-based seed transfer (GBST)** system in BC, is a system of "fixed" seed zones originally developed in the early to late seventies and refined in the late eighties to incorporate geographic transfer limits (latitude, longitude and elevation). These limits were the result of extensive provenance testing and research trials reflecting the science of the day.

Climate and forest genetic science has since advanced, and we now know that current seed deployment is unnecessarily restricted in some places. In addition, GBST does not lend itself to a province-wide, effective system of assisted migration to address a changing climate. **Climate Based Seed Transfer (CBST)** is a strategy for use in forest tree adaptation (Figure 1).

<sup>1</sup> 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](http://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

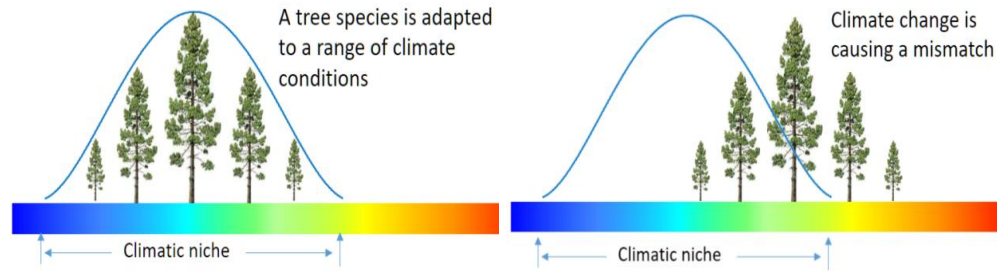


Figure 1 Illustration of climate change impacts on forest tree adaptation.  
Source: Dr. Tongli Wang, UBC

### What is Climate-Based Seed Transfer (CBST)?

**CBST** is a science-based methodology and framework that uses climate variables to match seed sources (seedlots) to climatically suitable planting sites. CBST in BC<sup>2</sup> 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 as adaptation lag) and future climate change.

### Assisted Migration and 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 adaptability (resilience), 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.

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.<sup>3</sup>

### Migration Distance

In BC, the movement of seed/seedlings to sites that represent the predicted climate appropriate for the seed is small, representing only a **quarter of a rotation** into the future (i.e., 20 years in the Interior and 15 years on the Coast). This 'quarter rotation' adjustment will be updated as we move forward in time.

<sup>2</sup> 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](http://www.for.gov.bc.ca/hfd/pubs/Docs/Tr/tr099.htm)

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