

Climate Based Seed Transfer Policy and Implementation

Presentation to the FGC Interior Technical Advisory Committee Extension Event

January 31, 2018



Part 1 – Background

Part 2 – CBST Policy and Implementation

Part 3 - Impact Assessment and Gap Analysis

Part 4 – Road Map



PART 1

Background Brief Overview of CBST Science Foundation and Policy Framework



What is Climate Based Seed Transfer (CBST)?

"Climate Based Seed Transfer (CBST) refers to a seed transfer system <u>based on climate</u> for the movement (transfer) of seed used in reforestation, to adapt to and mitigate the impacts of climate change."





How does CBST compare with BC's current seed transfer approach?

Both systems are science based and supported by data from provenance trials

Current

• A geographically-based methodology using, longitude, latitude, elevation and biogeoclimatic zone,

CBST

- A climate-based methodology that matches the climate of the seed source with the current and (near) future climate of a planting site.
- Based on new and emerging climate and forest genetic science.
- Includes "assisted migration."



"Assisted Migration" is a climate change adaptation strategy that involves the intentional movement of tree seed, from areas they grow naturally, to planting sites that are climatically suitable for their growth at the present time and in the near future."





CBST Science Foundation

- Based on climate and forest genetic (provenance) data
- Climate represented by BEC variants
- CBST accounts for <u>both</u> past (adaptation lag ~70years) and future climate change (15yrs coast; 20yrs interior)
 = Climate migration distance is

to the <u>firs</u>t quarter rotation

Baseline data sets

- BEC10
- ClimateBC
- Transfer functions
- Minimum genetic and species suitability thresholds
- Expert opinion

For more information, on the science foundation, see Technical Report No. 099

Example of Shift to a Seedlot Area of Use

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CBST Seedlot Selection Tool Version 1.0

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The CBST seed deployment area (i.e. CBST Area of Use) comprises the **orange** <u>and</u> **purple** areas marked on the map. The current seed deployment area (or Area of Use) is marked in the **brick red** colour.



Assessing Risks

- Doing nothing about climate change is high risk
 - Losses from increased wildfire and pests
 - Loss of productivity through maladaptation
- Using CBST mitigates the impacts of climate change and reduces risk
 - We are currently planting into sites that are too warm for the seed
 - With CBST, we will be planting into sites that are slightly colder (in anticipation of ongoing climate change)
 - CBST takes a conservative approach focusing more on catching up with climate change to date, rather than projecting too far into the future



Related Reforestation Considerations

- You can also lower your risk by investing a bit more:
 - Use Class A seed with highest genetic worth
 - Make robust stock choices
- Climate change affects other reforestation decisions

 species selection, microsite selection, pests and
 diseases, wildlife, etc
- A monitoring and evaluation program to support an Adaptive Policy approach to CBST is under development



PART 2 CBST Policy and Implementation

CBST Policy Timeline

(Revised January 2018)





Seed Transfer Policy Options starting April 1, 2018

When selecting suitable seedlots for reforestation can use:

- Existing Seed Transfer Limits Chief Forester Standards for Seed Use, existing Section 8, or
- Climate Based Seed Transfer Standards New optional section to the Chief Foresters Standards for Seed Use,* or
- **Mix of both** Use of both approaches *identified above* (e.g. to address "gaps" where suitable seed is not identified under CBST).

*Before April 1, 2018, can use an approved CBST alternative



Transition Period

The Transition Period

- Provides time to learn a new system
- Maximize flexibility to address gaps in both systems (orphaned BECvars and orphaned seedlots)
- Opportunity to use up seed that you may no longer be able to use in your operating area under CBST
- EVENTUALLY the pre-CBST Standards will be removed as an option.
- Current thinking is a 2 to 5 year transition
 - From discussion with a Stakeholders Advisory Group
 - Broader stakeholder consultation to be undertaken.



Strategic Use of Policy Options in Transition Period

If your goal is to maximize productivity of your site, use policy options is this order of priority:

- 1. Use CBST seed transfer and Class A seed with the highest Genetic Gain
- 2. Use Current transfer standards with Class A seed with the highest Genetic gain
- 3. Use CBST seed transfer and Class B seed
- 4. Use Current transfer standards and Class B seed

If none of these policy options have seed availability – consult with FIRM.



The CBST Seedlot Selection Tool developed by Forsite Consultants, Ltd, Vernon, BC, has enabled mapping of shifts in seed deployment and procurement areas through CBST and has been used to support the Alternatives process in 2017.

"I have a Seedlot"

To identify suitable plantation BEC variants based on climate "I have a Cutblock"

To identify Suitable Seedlots based on climate

Functionality and data are being moved into SPAR for April 1, 2018 to align with the option to use CBST Transfer Standards ¹⁶

'I have a Seedlot'



CBST Seedlot Selection Tool Version 1.0

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Step 1: Enter seedlot, or set species and BEC variant

Step 2: <u>Click</u> 'Go' **Step 3:** <u>View</u> seed deployment map, and the list of suitable plantation BEC variants

'I have a Cutblock'



CBST Seedlot Selection Tool Version 1.0





Step 1: Enter species and BEC variant (of cutblock)

Step 2: <u>Click</u> 'Go' **Step 3:** View seed procurement map, and a list of suitable seed BEC variants and seedlots



PART 3 Impact Assessment and Gap Analysis



Key questions

- To what degree does CBST impact seed use, investments, and assets, including impacts to:
 - Seed Users
 - Seed Owners; and
 - Seed Producers?
- How are CBST impacts characterized (losses, gains)?
- What are the opportunities (e.g. new seed sources moving in)?
- Are there gaps in CBST coverage? If yes, are there opportunities to fill them (e.g. with Class B)?



- Creation of an Interim CBST "SPU" for analysis and planning purposes
- Seed of the same species, from same seed source BEC variant, has the same CBST deployment area = "BECvar Group Name"

SXTOLOW1

SpeciesSXSource_BECvarIDFdk2

ESSFdv1 ESSFxc1 ESSFxc3 ICHmk2 **IDFdc** IDFdk1 CBST IDFdk3 AOU IDFdk4 BEC **IDFdw** vars MSdc1 MSdc2 MSdc3 MSdm1 MSdm2 MSdm3 MSdv MSmw2 MSxk1 MSxk2 MSxk3 MSxv SBPSdc SBPSmc SBPSmk SBPSxc 21 SBSmc3

SRSmm



Schematic of Quantified Impact Analysis:





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74																		
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405																		
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591																		
F03	A	PLI	Arrow TSA	PLITOLOW2	ICHmk1	set([338, 311])	403	100%	0	0%	403	100%	3-H	0	0%	0	0%4	4SLoss
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GIS SLIDES



PART 4 Road Map



Road Map

Near Term (now to 2 years)

- Complete impact and gap analysis, make tools available
- First revisions to Standards August 1, 2018 Effective Date
- Broader stakeholder engagement on draft policy and transition plans
- Transition strategy and full implementation plan
- Ongoing data and climate updates
- Monitoring framework



Road Map

Short Term (2 to 5 years)

- New SPUs/Breeding Zones defined
- Amendments to Chief Foresters Standards to end transition period
- Monitoring and Evaluation

Longer term (5+ years)

- New Seed Orchards
- Coordination with the Climate Informed Species Selection (CISS) Tool, led by RPB.



For more information, contact:

- Margot Spence, Seed Policy Officer/CBST project lead, Forest Improvement and Research Management Branch (<u>Margot.Spence@gov.bc.ca</u>)
- Susan Zedel, Seed Resource Specialist, Forest Improvement and Research Management Branch (<u>Susan.Zedel@gov.bc.ca</u>)
- Leslie McAuley, Decision Support Officer, forest Improvement and Research Management Branch (<u>Leslie.Mcauley@gov.bc.ca</u>)



See, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, **Tree Seed** and **CBST** webpages,

www.gov.bc.ca/climatebasedseedtransfer

