



FFT ASSISTED SPECIES MIGRATION GUIDANCE

Scope

This guidance covers the assisted movement of species into biogeoclimatic zones/subzones where they are not currently considered as preferred or acceptable in response to anticipated climate change.

1. Introduction

The primary objective of Forests for Tomorrow (FFT) Program is to improve the long-term timber supply through the establishment of new forests on areas impacted by the mountain pine beetle (MPB) and catastrophic fires outside licensee and BC Timber Sales basic reforestation obligations¹.

Climate change will result in significant alterations to natural systems challenging the ability of natural resource managers and resource-based communities to adapt². However, there are opportunities to minimize the impacts of climate change including the assisted migration of species in response to anticipated environmental changes and managing for diversity to increase resiliency to biotic and abiotic influences.

FFT-funded silviculture operations will contribute to achieving diverse mixes of desirable tree species within FFT treatment units, subject to applicable site management objectives, site limitations, and considerations of economic return. The use of genetically improved suitable seedlings is one of the program's nine guiding principles³ (**FFT Principle 5**. Species diversification and utilizing genetically desirable seedlings are reforestation and restoration objectives).

2. Purpose and Objectives

Under FFT Policy 1, MANAGEMENT OF TREE SPECIES COMPOSITION, direction is given to promote the use of a diversity of species when feasible and ecologically appropriate to do so in order to increase resilience.

The purpose of this Ministry of Forests and Range (MFR) FFT ASSISTED SPECIES MIGRATION guidance is to provide direction on assisted migration of species into biogeoclimatic (BEC) zones/subzones where they do not currently occur in response to anticipated climatic changes in those zones/subzones.

The objectives of this guidance is to ensure that the assisted migration of species considers:

- The existing species diversity within each current BEC zone and subzone

¹ Forest for Tomorrow Program Management Plan, June 15, 2005, p. 5

² Preparing for Climate Change: Adapting to impacts on British Columbia's forest and range resources, May 18, 2006

³ Forest for Tomorrow Program Management Plan, June 15, 2005, p. 14



- [Climate change information](#) that could influence species vulnerabilities
- Current and future stand resilience to biotic and abiotic influences
- Species growth requirements individually and in mixtures
- Appropriate density ranges and variability
- Maintenance of natural diversity at the landscape level
- Site and stand objectives (i.e. timber, water, wildlife, etc)
- Timber supply implications

3. General Guidance:

Choosing a species

An ecological and ecosystem-specific approach to the selection of tree species and stocking is essential because each tree species has adapted to a specific range of environmental conditions, and its growth and behaviour depend on the ecosystem in which it grows. In an unfavourable environment, that species growth potential will not be realized, and its susceptibility to damaging agents will increase.

The challenge is to predict how a changing climate will impact the range of environmental condition on a site and how those changes will impact the growth and behaviour of the species on that site. The deployment of species on a site not only has to consider the impacts of the current climate on the growth and behaviour of that species but also the impacts of future climate.

Appropriate species for a site are typically determined on the basis of a species' productivity, reliability, and silvicultural feasibility based on current knowledge of the productive capability of each site series, the silvics of the tree species, and the growth and development of existing second growth forests. When choosing a species for assisted migration one will have to consider these factors not only for the current climatic conditions but also for the anticipated future climate.

When prescribing a species to be migrated onto a site the prescriber should consider:

- the desired stand structure
- the non-timber objectives for the area
- the desired reproduction method
- the potential for natural regeneration
- the role of advance regeneration
- the interaction of the migrated species with anticipated and or planned local tree and non-crop vegetation species
- biotic and abiotic hazards, such as pests, likely to affect the stand throughout the rotation (e.g., in areas with a high risk of leader weevil infestation, spruce should be limited to mixed-species stands.
- the feasibility of the treatments required to establish the stand under existing management constraints



- the effect of the species or combination of species on the site
- the maintenance of biological diversity.

Non-indigenous exotic species and provenances

Seed of non-indigenous exotic species or provenances intended for use on Crown land must be registered. In order to be registered, the seed must meet the criteria outlined in the *Chief Forester’s Standards for Seed Use*.

The use of non-indigenous exotic species within the FFT program is not encouraged and any use must be approved by the FFT program managers.

Forest health

When making the species selection decision, consider forest health concerns for the specific species and site combination. Consult with local forest health specialists for more information.

Soil fertility

When selecting a tree species, consider the effect that the tree species, or a combination of tree species, will have on soil fertility. For example, on nutrient-poor sites, successive rotations of western hemlock or white spruce monoculture may result in a decline in productivity by increasing soil acidity. The relative availability of many plant nutrients is reduced by increasing soil acidity. On such sites, the addition of tree species with base-rich litter, such as western redcedar, trembling aspen, or red alder may ameliorate these conditions and improve soil fertility.

Biodiversity

British Columbia’s forests contain a wide variety of ecosystems and species and land managers should be aware of the need to maintain the biological diversity of these ecosystems. Forest trees, while only one component of a forest environment that includes a variety of life processes, are very important in providing structure and habitat for other organisms.

Tree species composition and stand structure are important variables that affect the biological diversity of a forest ecosystem. When considering the assisted migration of a species, consider the following points.

- Trees provide food, shelter, or substrate for other organisms. Since local tree species have evolved with the local flora and fauna, they are more likely to furnish these needs than are tree species transferred in from other areas.
- If assisted migration species is chosen as part of the reforestation strategy, it should be established in mixes with local species.



4. Specific Direction:

When planning for the assisted migration of a species onto a FFT reforestation site it must be ensured that:

- 1) the current climate is suitable for establishment
- 2) the climate suitable for the alternate species growth will reside at the site within 30 years,
- 3) the alternate species should comprise no more than 10% of the total trees planted in the targeted unit and the alternate species must be dispersed over the planting site, (unless very specific rationale can be provided such as targeting specific micro-sites, etc.)
- 4) the deployment of the alternate species is consistent with the Chief Foresters Standard on Seed Use,
- 5) the seedlots chosen are suitable for the planting site and consistent with current direction on the movement of that seed,
- 6) when using Pw, rust resistant phenotypes be used,
- 7) the deployment of the alternate species is consistent with that species edaphic and hydrologic requirements (moisture/nutrient grid),
- 8) the alternate species is able to with stand the climate extremes of the ecosystem that you are moving it to (i.e snow load, frost threat, drought stress, etc.),
- 9) the movement and use of this species is recorded in RESULTS,
- 10) a monitoring process that focuses on the survival and growth of the alternate species in comparison to the current preferred species (such as survival lines or plots and spatial map) is established,
- 11) a FFT Adaptive Management project worksheet for this deployment of alternate species is prepared.
- 12) MFR research and Tree Improvement Branch staff are consulted prior to planning assisted migration of a species for advice and recommendations.

This direction does not supersede any refined direction that may come from the Chief Forester or the Species selection working group. This guidance will be modified to be consistent with that direction when it is released.

It is recommended that the tree species compendium be used for pertinent information on each alternate species being considered for deployment

<http://www.for.gov.bc.ca/hfp/silviculture/Compendium/>.