

# **Fort St. John Pilot Project**

## **Mixedwood Management Guidelines**

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## **TABLE OF CONTENTS**

<b>I. STRATEGY OBJECTIVES</b>	<b>3</b>
<b>II. BACKGROUND</b>	<b>3</b>
<b>III. CLASSIFYING AND TRACKING FOREST TYPES</b>	<b>3</b>
<b>A. Initial Cutblock Classification</b>	<b>4</b>
<b>B. Defining Initial Area targets</b>	<b>4</b>
<b>C. Ledger System for Balancing Forest Types Over Time</b>	<b>5</b>
<b>IV. PROPOSED METHODS OF REFORESTATION</b>	<b>8</b>

## **Mixedwood Management Guidelines under the Fort St. John Pilot Project SFMP**

### **I. GUIDELINE OBJECTIVES**

The guidelines are designed to provide foresters with the direction for choosing and managing reforestation pathways that will produce successful mixedwood stands at the landscape level and meet the commitments made in the Sustainable Forest Management Plan (SFMP). It will also be an evolving document that can incorporate new ideas, science and methodologies, as they become better known.

The objective of this mixedwood management strategy is:

- To describe the method for classifying and tracking forest types for forest management purposes.
- To describe some possible methods that will be implemented to achieve the desired future forest conditions and forest types described in the SFMP.

### **II. BACKGROUND**

In the SFMP, Section 4.7 (Reforestation Strategy) states that the participants must declare to reforest an area within a cutblock as a coniferous area, a deciduous area or a mixed wood area. The prescribing and implementing foresters are responsible to ensure stocking on the site is managed to provide forest establishment sufficient to meet the landscape level targets. This section also says that the short-term mixedwood management will be achieved primarily through reforestation strategies that maintain **separate deciduous and coniferous strata**. The reforestation guideline will involve approaches that stratify the area to be reforested into discrete deciduous and coniferous strata. For the term of this SFMP, mixedwood regimes for intimate mixtures of conifer and deciduous will be established on 10% of the harvested mixedwood landbase as operational trials. Over the longer term, a strategic approach will be developed to guide the deployment of reforestation strategies that will establish an appropriate desired future forest condition.

Mixedwood forests will be sustained by managing forest type distribution as per Section 6.1 (Forest Types). Section 6.1 indicates the percent distribution of forest type (deciduous, deciduous mixedwood, conifer mixedwood, conifer) >20 years old by landscape unit.

### **III. CLASSIFYING AND TRACKING FOREST TYPES**

In accordance with the Fort St. John Pilot Project Regulation (FSJPPR) and SFMP, the participants will declare to reforest the cutblock as a coniferous area,

a deciduous area, or a mixedwood area in the Site Level Plan by incorporating the appropriate stocking standards. The mixedwood forest type area will be further defined into deciduous leading or coniferous leading mixedwoods.

### A. Initial Cutblock Classification

The following process will be used to categorize a cutblock into a forest type class:

Prescribing foresters will review the gross volume for a grouping of blocks such as in a Timber Sales Licence or Timbermark grouping. This grouping of blocks may be larger if more blocks are ready to be submitted for declaration and are in close vicinity (for example, blocks managed by the same participant but being harvested under different licenses). The source of the volume statistics shall be the timber cruise block-method compilation summary. Forest Types shall be classified according to the percentage of gross volume by species type. The species types are **coniferous** and **deciduous**. The tree species included in each species group, and the corresponding cruising codes, are listed in the following table.

SPECIES TYPE	TREE SPECIES	CRUISE COMPILATION CODE
Coniferous	White spruce ( <i>Picea glauca</i> ) Black spruce ( <i>Picea mariana</i> ) Lodgepole pine ( <i>Pinus contorta</i> ) Subalpine fir ( <i>Abies lasiocarpa</i> ) Tamarack ( <i>Larix laricina</i> )	S S PL B L
Deciduous	Trembling aspen ( <i>Populus tremuloides</i> ) Balsam poplar ( <i>Populus balsamifera</i> ) Paper birch ( <i>Betula papyrifera</i> )	AT AC E

If the leading species type in the block contains greater than 75% of the gross volume, it shall be considered 'pure' Forest type – either 'pure' deciduous or 'pure' coniferous. If the species types are between 25% and 75% of the gross volume, the block shall be classified as a 'mixedwood' Forest type – either deciduous-leading or conifer-leading mixedwood.

### B. Defining Initial Area targets

The process for defining area targets is designed to give prescribing foresters a method for assigning the original declarations on a Standard Unit (SU). The

areas determined in this original forest type declaration will form the baseline proportions in each ledger population described in section C below for future balancing. This process for defining the area targets is described below:

- If the block is considered pure coniferous (>75% conifer), then 100% of the NAR will be tallied as conifer reforestation.
- If the block is considered pure deciduous (>75% deciduous), then 100% of the NAR will be tallied as deciduous reforestation.
- If the block is considered a conifer leading mixedwood (50 to 75% coniferous), then minimum of 51% of the NAR is tallied as coniferous reforestation and a maximum of 74% of the NAR is tallied as conifer.
- If the block is considered a deciduous leading mixedwood (50 to 75% deciduous), then minimum of 51% of the NAR is tallied as deciduous reforestation and a maximum of 74% of the NAR is tallied as deciduous.

Once the areas have all been accounted within the grouping of blocks, the prescribing foresters will stratify standard units (SU), assign the appropriate SU forest types, assign stocking standards and develop silviculture regimes for each cutblock designed to achieve the required area targets determined above.

### **C. Ledger System for Balancing Forest Types Over Time**

In accordance with the Fort St. John pilot project SFMP landscape level reforestation strategy, the process for tracking the declaration of the forest type areas determined above needs to be flexible enough to allow Professional Foresters to exercise their professional judgment at the cutblock level to vary regimes and/or make corrective actions as required to achieve the landscape level targets.

This concept will require participants to maintain a ledger or tracking system to ensure forest type groups are maintained on the landscape within the scope of the participants' management. The ledger or tracking system should maintain a history of the original declarations as determined above. The original declarations will form the baseline proportions for balancing future area exchanges of conifer and deciduous strata. The ledger or tracking system must also track future reclassifications to ensure the original baseline proportions, as determined at the Standard Unit level (original forest type declaration), are being maintained. Progress will be tracked internally and on an annual basis.

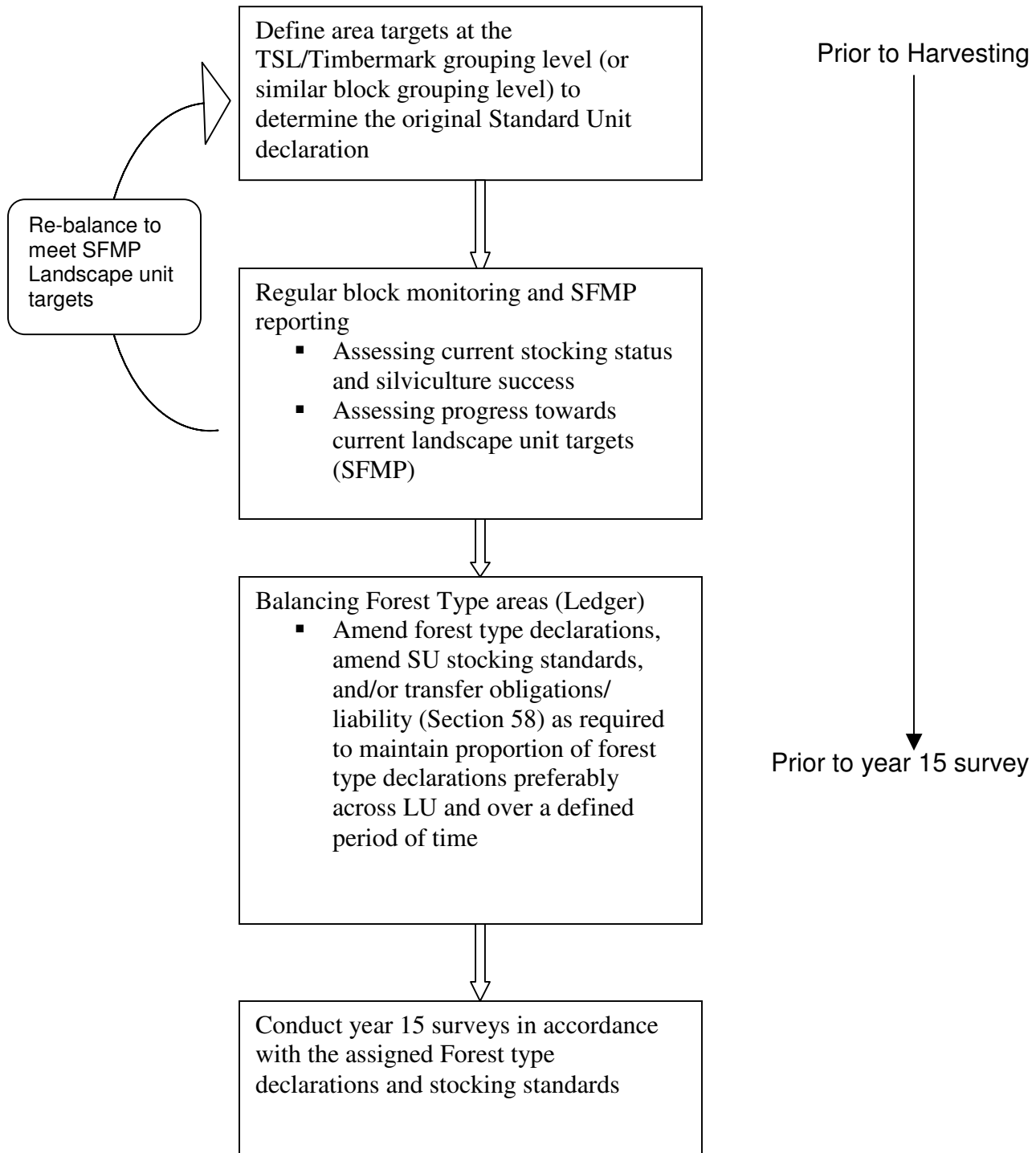
The population of standard units to be balanced should be within a defined period of time, using the harvesting commencement dates, and preferably within the same landscape unit. However, if there are not suitable areas within the

landscape unit to exchange, the balancing of forest types may occur within adjacent landscape units or across the TSA provided the exchanges will not result in a landscape unit exceeding the target ranges described in the SFMP. The following general principles will be used to evaluate suitable areas for conducting a reforestation declaration exchange:

- Areas considered for exchange should have a similar site index.
- Areas considered for exchange should be verified in the field to ensure they are ecologically suitable for species changes.
- Exchanges between blocks in as close proximity as operationally feasible should be considered first prior to balancing areas across the TSA.
- Areas to be exchanged should consider the operational logistics and economics associated with establishing a different crop tree species on site.
- Area exchanges must occur between areas of similar ages as described below.
- Once standard units are declared well growing, they will not be eligible for exchange, but will remain in the population for intimate mixedwood percentage calculations.

The population of blocks will include all blocks harvested since November 15, 2001 (start of the FSJPPR), and the population of blocks upon which the intimate mixture proportion is based will not contain those with a harvest start date greater than 15 years in the past (applies beyond 2016). It is preferable that the balance be maintained across each managing participant's population of blocks and areas of liability. If managing participants would like to exchange blocks and liability for the purpose of balancing forest type areas, this exchange must be done in writing in accordance with Section 58 (Assignability) of the Fort St. John Pilot Regulation. The reclassification of forest type areas, whether done through balancing individual participant's blocks or through exchange of blocks, must be completed prior to the year-15 MSQ survey for those blocks. See figure 1 below for a summary of the overall process.

**Figure 1: Forest Type Declaration and Balancing Process**



#### IV. PROPOSED METHODS OF REFORESTATION

- 1) "Large scale" un-mix the mix (each block will be managed for pure conifer or pure deciduous),
- 2) "Small scale" un-mix the mix (divide blocks into discrete strata of pure conifer and pure deciduous),
- 3) Intimate mixtures
  - Deciduous and conifer are co-dominants in the canopy, or
  - Conifer (usually white spruce) is under a taller canopy of deciduous
  - "Micro-scale" un-mix the mix (intermixing patches or strips within the blocks)

The methods for 1 and 2 can be accommodated using the process of defining area targets for discrete strata of conifer and deciduous as described above. The various levels of patch size that result from the "large scale", "small scale" and "micro-scale" methods will produce mixedwood forest at a landscape level. Methods 1 and 2 will result in distinct patches of conifer and deciduous areas that will produce landscape level mixedwoods. Methods 1 and 2 can be applied using current harvesting practices and stocking standards for conifer and deciduous, outlined in the SFMP (Appendix 6).

The commitment for the term of the current SFMP regarding intimate mixtures of conifer and deciduous is to manage intimate mixtures on 10% of the harvested mixedwood landbase as operational trials.

"Intimate mixedwood" means a stand where deciduous and conifer trees are grown side-by-side, and where deciduous and conifer trees are co-dominant in the stand canopy.

"Successional mixedwood" means a stand where deciduous and conifer trees are grown side-by-side, and where deciduous trees make up the stand canopy. Conifer trees are in the understory.

Current policies, practices and information bases in BC do not effectively support mixedwood management using intimate mixtures. Successful policy will require accountability, but should also be flexible enough for managers to adjust stand-level plans in response to variation in early stand development (e.g., poor survival of plantations, poor establishment of aspen, etc.) (Comeau *et al.* 2005). The complexity in stand development and wide variety of possible stand conditions requires greater understanding of the natural and managed stand dynamics as well as better models for forecasting growth and yield projections.

For the term of this SFMP the participants should be very clear in their prescriptions that areas managed as intimate mixtures are operational trials.

For the purpose of the final reforestation assessment, discrete strata of conifer would fall in the applicable 15-year population for the conifer MSQ surveys.

Preferably, discrete deciduous areas would be surveyed at the same 15-year period. Assessment procedures for discrete deciduous strata will be conducted using the current free growing survey procedures until an MSQ type assessment for deciduous areas is available. Growth model trial runs are currently being completed on deciduous species so a MSQ type assessment for deciduous should be available in the near future. Assessment procedures and standards will be documented as operational trials for strata with intimate mixtures.

Table 1 details some silviculture options for boreal mixedwoods forests. The practices followed depend on the current state of the stand and the desired future forest (stand) condition.

Table 1: From Kabzems, R. 2002. Silviculture options for boreal mixedwoods. [Modified from Figure 2 in Lieffers et al. (1996)]

<b>Current State</b>	<b>First Treatment</b>	<b>Secondary Treatment</b>	<b>Outcome</b>
1. Deciduous or Deciduous Coniferous (vigorous)	A) Clearcut (suckering) B) Late understory plant C) Early understory plant with wind protection	Understory protection  Understory protection	Deciduous or Deciduous-Coniferous  Stands are horizontal mixes of coniferous patches and these are of different age.  Stands are horizontal mixes of coniferous patches and deciduous patches and these are of different age.
2. Deciduous or Deciduous Coniferous (breaking up)	A) Clearcut (suckering) B) Understory site preparation and plant C) Clearcut, site preparation, plant	Understory protection  Vegetation management	Deciduous  Stands are horizontal mixes of coniferous patches and deciduous patches and these are of different age.  Coniferous or Coniferous-Deciduous (Mixture)

<p>3. Coniferous or Coniferous-Deciduous</p>	<p>A) Clearcut (suckering)</p> <p>B) Clearcut, site preparation, plant</p> <p>C) Clearcut, site preparation, plant</p> <p>D) Shelterwood</p> <p>E) Leave seed clusters</p> <ul style="list-style-type: none"> <li>▪ leave for natural</li> <li>▪ site preparation</li> </ul> <p>F) Group selection</p>	<p>Vegetation management</p> <p>Removal cut</p>	<p>Deciduous or Deciduous/Coniferous</p> <p>Deciduous/Coniferous (Mixture)</p> <p>Coniferous or Coniferous-Deciduous</p> <p>Coniferous or Coniferous-Deciduous</p> <p>Deciduous-Coniferous (Mixture)</p> <p>Deciduous-Coniferous (Mixture)</p> <p>Stands are small patches of intermixed deciduous and coniferous but the patches are of different ages.</p>
<p>4. Overstory Deciduous or Deciduous Coniferous Understory Coniferous (short even-aged)</p>	<p>A) Understory protection</p>		<p>Stands are horizontal mixes of coniferous patches and deciduous patches and these are of different age.</p>
<p>5. Overstory Deciduous or Deciduous Coniferous Understory Coniferous (tall even-aged)</p>	<p>A) Understory protection with wind protection</p>		<p>Stands are horizontal mixes of coniferous patches and deciduous patches and these are of different age.</p>
<p>6. Overstory Deciduous or Coniferous Understory Coniferous (uneven-aged)</p>	<p>A) Understory protection with wind protection</p> <ul style="list-style-type: none"> <li>▪ Tall understory cut</li> </ul>		<p>Stands are horizontal areas of young deciduous between patches of all-aged coniferous, leading to selection system.</p> <p>Stands are horizontal mixes of coniferous patches and deciduous patches and these are of different age.</p>

<p>7. Overstory Coniferous Deciduous or Coniferous Understory (uneven- aged)</p>	<p>A) Understory protection with wind protection</p> <ul style="list-style-type: none"> <li>▪ Tall understory cut</li> </ul> <p>B) Single tree selection</p>		<p>Stands are horizontal areas of young deciduous between patches of all-aged coniferous.</p> <p>Stands are horizontal mixes of coniferous patches and deciduous patches and these are of different age.</p> <p>Coniferous (all-aged)</p>
<p>8. Overstory Coniferous Deciduous or Coniferous (partly uneven-aged) Understory Coniferous (scattered pockets of advance growth)</p>	<p>A) Irregular shelterwood removal cuts</p>		<p>Coniferous or Coniferous Deciduous</p>

**Reference:**

**Philip G. Comeau, Richard Kabzems, John McClarnon, and Jean L. Heineman 2005.** Implications of Selected approaches for regenerating and managing western boreal mixedwoods. For. Chron. 81(4): 559-574

**Lieffers, VJ, RB Macmillan, D MacPherson, K Branter, and JD Stewart. 1996** Semi-natural and intensive silviculture systems for the Boreal mixedwood forests. For. Chron. 72: 286-292.