

## **Appendix 5: Reforestation Strategy: Survey Design and Field Procedures**



## Survey Design and Field Procedures

### I) Conifer Survey Design and Field Procedures

#### Scope of this document

This document describes only the survey methods to be employed to meet the requirements of yield assessment and inventory labels. It is limited, at this time, to data collection for conifer plantations.

Prior to collecting plot data in the field the following information should be reviewed and used to develop strata within each cutblock. Minimum strata size is 2 ha.

#### 1. Pre-harvest prescription or plan

Ensure survey map reflects original prescription or plan map and any subsequent revisions. Place SU boundaries with different species or stocking standards on the survey map. Review the prescription or plan for any other requirements or conditions that would affect stocking levels and set boundaries as required.

#### 2. Establish plot locations

Locate 100m grid locations on the survey map following NAD 83 datum. If the survey map has not been accurately geo-referenced then this step will not be practical and plots will need to be established in the field and added to the map. Plots that fall outside the NAR will be null plots.

#### 3. Block assessment in the field

A block walkthrough prior to plot establishment is required to complete the following:

- 1) Review blocks in the field and update the map. This may require identification of unmapped features, traversing of boundaries, etc.
- 2) Map inventory polygons utilizing current procedures by reviewing species composition, site productivity and stocking. Separate those areas below minimum stocking levels.
- 3) Identify and map areas that may require further treatment to reach well growing status

#### Data Collection

##### Count Plot

A count plot is located where the last three digits of either or both of the UTM easting and northing are 100, 300, 500, 700, or 900. Area for the plot is 50m<sup>2</sup> (3.99m radius). Quadrants are established along cardinal directions. At a count plot, the following is done:

##### a) Record the Strata

Based on the strata mapping as above.

**b) Count stocked quadrants**

Record the number of quadrants that contain at least one acceptable tree. An acceptable tree is:

- i) Preferred or acceptable species (as listed in the SP for the SU)
- ii) Healthy (Meets forest health standards)
- iii) Acceptable advance regeneration (meets adv. regen. standards)
- iv) Well Growing

**c) Count potential stocked quadrants after brushing**

Record the number of quadrants that would contain at least one acceptable tree following a brushing treatment.

**d) Record UTM coordinates**

Record the UTM coordinates of the plot.

**Data Collection at Full Measure Plot**

A Full Measure Plot is one where the last three digits of both the UTM easting and northing are 000, 200, 400, 600, or 800. At an enhanced plot, collect all of the data required at a Count Plot plus the following:

**a) Record BEC**

Assess site series in an area approximately 5.64 m around plot center. Based on a rough ocular estimate, assign the area to the dominant site series. Record BEC zone/subzone/variant/site series.

**b) Record species class.**

Assess species composition in an area approximately 5.64 m around plot center. Based on a rough ocular estimate, assign the area to 1 of 3 species groups:  $\geq 80\%$  PI,  $\geq 80\%$  Sx, or mix based on 20% divisions.

**b) Height Measure tree**

In a 5.64 m radius plot, make a rough ocular estimate of whether PI or Sx is more common. Locate the tallest tree of this species that is live and not a residual. Measure and record total height and species code. If this tree is also a suitable growth intercept sample tree (healthy, undamaged and unsuppressed), record breast height age by counting whorls.

**c) Additional Data**

In a 3.99 m plot, collect total tree count, and total conifer count and average height by species.

**Map areas of low stocking**

If during the survey, a mappable patch (2 ha or larger) of low stocking was found, transfer its boundaries onto the survey map. Map patches that a rough ocular estimate suggests have < MSS preferred and acceptable species, free from brush and healthy. And provide a description of the area and recommendations for treatment.

**Map treatment units**

If during the survey a mappable area (2 ha or larger) that would benefit from further treatment i.e. fill planting, vegetation control, etc. is found then transfer the boundaries to the map and provide a description of the area and recommended treatment.

**Map areas of high density stocking**

If during the survey, a mappable patch (2 ha or larger) of stocking >20,000 stems per hectare was found, transfer its boundaries onto the survey map and provide a description of the area and recommendations for treatment.

**Data Format**

In an ASCII or excel format file provide the following:

For each plot:

1. Cutblock identity (e.g., CP838 Block 1A)
2. Plot identity (e.g., plot # 1)
3. UTM coordinates of the plot (e.g., 307200; 5639200)
4. Stratum identity (e.g., species class, density class, target stocking class)
5. Stocked quadrant tally (e.g., 0, 1, 2, 3, or 4)
6. Potential stocked quadrant tally following a brushing treatment (e.g., 0, 1, 2, 3, or 4)
7. Plot type (S=count plot, E=full measure plot)

In addition to the above, for each enhanced plot:

1. Height sample tree species (e.g., PI or Sx)



2. Sample tree height (e.g., 2.5 m)
3. If height sample tree is suitable GI tree, record breast height age (e.g., 4 years)
4. BEC classification (zone/subzone/variant/site series) (e.g., MSdm2 01)
5. Average height by species
6. Total tree count (e.g., 25)
7. Total conifer count (e.g., 21)

### Supporting Data

**Stratum Description** - Brief description of stratum and criteria used to establish the stratum.

**Inventory Label** - Requires a label for each stratum

## II) – Deciduous Survey Design and Field Procedures

### Scope of this document

The intention is to utilize the Mean Stocked Quadrant (MSQ) procedure as the desired assessment method throughout the establishment to well growing period. While many of the processes of the assessment are comparable, this document describes only the survey methods to be employed to meet the requirements of yield assessment and inventory label creation.

Prior to collecting plot data in the field the following information should be reviewed and used to develop strata within each cutblock. Minimum strata size is 2 ha.

#### 1. Pre-harvest prescription or plan

Ensure survey map reflects original prescription or plan map and any subsequent revisions. Place SU boundaries with different species or stocking standards on the survey map. Review the prescription or plan for any other requirements or conditions that would affect stocking levels and set boundaries as required.

#### 2. Establish plot locations

Locate 100m grid locations on the survey map following NAD 83 datum. If the survey map has not been accurately geo-referenced then this step will not be practical and plots will need to be established in the field and added to the map. Plots that fall outside the NAR will be null plots.

#### 3. Block assessment in the field

A block walkthrough prior to plot establishment is required to complete the following:

- 4) Review blocks in the field and update the map. This may require identification of unmapped features, traversing of boundaries, etc.

Map inventory polygons utilizing current procedures by reviewing species composition, site productivity and stocking. Separate those areas below minimum stocking levels.

### Data Collection

#### Count Plot

A count plot is located where the last three digits of either or both of the UTM easting and northing are 100, 300, 500, 700, or 900. Area for the plot is 50m<sup>2</sup> (3.99m radius). Quadrants are established along cardinal directions. At a count plot, the following is done:

- a) Record the Strata

Based on the strata mapping as above.

- b) Count stocked quadrants

Record the number of quadrants that contain at least one acceptable tree. An acceptable tree is:

- i) Preferred or acceptable species (as listed in the SLP for the SU)
- ii) Healthy (Meets forest health standards)
- iii) Well Growing
- d) Tally total tree count
- e) Tally countable deciduous stems
- f) Assess forest health factors
- g) Record UTM coordinates

Record the UTM coordinates of the plot.

#### Data Collection at Full Measure Plot

A Full Measure Plot is one where the last three digits of both the UTM easting and northing are 000, 200, 400, 600, or 800. At an enhanced plot, collect all of the data required at a Count Plot plus the following:

- a) Record BEC

Assess site series in an area approximately 5.64 m around plot center. Based on a rough ocular estimate, assign the area to the dominant site series. Record BEC zone/subzone/variant/site series. This will assist in determining the associated BEC site index grouping the stratum will be placed in.

**b) Height Measure tree**

In a 5.64 m radius plot, locate the largest diameter tree of the leading species that is live and not a residual. Measure and record total height and species code.

**c) Additional Data**

Inventory label data collection

**Map areas of low stocking**

If during the survey, a mappable patch (2 ha or larger) of low stocking was found, transfer its boundaries onto the survey map. Map patches that a rough ocular estimate suggests have < MSS preferred and acceptable species, free from brush and healthy. And provide a description of the area and recommendations for treatment.

**Data Format**

In an ASCII or excel format file provide the following:

For each plot:

8. Cutblock identity (e.g., CP838 Block 1A)
9. Plot identity (e.g., plot # 1)
10. UTM coordinates of the plot (e.g., 307200; 5639200)
11. Stratum identity (e.g., WG versus NSR )
12. Stocked quadrant tally (e.g., 0, 1, 2, 3, or 4)
13. Plot type (S=count plot, E=full measure plot)

In addition to the above, for each enhanced plot:

8. Sample tree species
9. Sample tree height (e.g., 2.5 m)
10. BEC classification (zone/subzone/variant/site series) (e.g., BWBS mw 01)



**11. Average height by species**

**12. Total tree count (e.g., 25)**

**Supporting Data**

**Stratum Description - Brief description of stratum and criteria used to establish the stratum.**

**Inventory Label - Requires a label for each stratum. Those strata that did not have a plot established within it must still have an inventory label ocularly assessed.**