Chapter 2 Sampling Methodology

2.1 Sampling Extent

The main focus of this report is the development of work plans and forest management recommendations for distinct Forest Management Areas within the Park. Forest stands were sampled (Photo 2) throughout the Park using both quantitative and qualitative sampling procedures. In addition, several other Park attributes related to vegetation management were investigated and documented, with recommendations provided. Each of these features is described below.

Photo: 2. Sampling the Park's forests

2.2 Timing of Fieldwork

All fieldwork pertaining to forest sampling, crusher dust migration documentation, wetland delineation and archaeological mapping was executed between March 12 and March 26, 2008.

2.3 Field Crews

The fieldwork conducted under this contract was performed by Clinton Pinks (CBCL), Ian Bryson (CBCL) and Kirk Schmidt (Nortek Resource Solutions Inc.) with assistance from Coastal Trilling and Restoration staff Marc Chisholm, Dave Aikens and James Bryson. The various field programs were conducted by the following team members specifically:

- Plot sampling: Bryson, Pinks, Schmidt, Chisholm, Aikens, Bryson
- Crusher dust migration: Bryson
- Wetlands delineation: Pinks, Bryson
- Trail ROW ground vegetation: Pinks, Bryson
- Archaeology: Bryson, Pinks, Schwartz & Schwartz

2.4 Forest Stand and Sampling Unit Delineation

Individual forest stands were delineated from georeferenced aerial photography from 2006. These delineations were used in conjunction with current road and trail alignments to define the practical boundaries of the Sampling Units within the Park. All data collection, analysis and treatments proposed in this report are based on these Sampling Units, including the distribution of plot sampling locations. Both, quantitative and a qualitative analysis conducted within the Park were based on theses Sampling Units and are described further below.

2.4.1 Quantitative Sampling

A 1% sampling intensity was targeted for the Park's forests. The total area of the park is 77 hectares, of which 14.4 is non-forested. 1% sampling of the balance of the Park (61.7 ha of forest) was to be achieved with the placement of a minimum of 62 sampling plots.

For each sampling plot location, a 100 m^2 (10 m x10 m) plot was delineated, with edges facing in each cardinal direction. The plot center was georeferenced using a handheld Garmin Map76Cx GPS unit. Plot centers were averaged over approximately five minutes, with a typical positional accuracy of 2.5 to 3.5 m. Four photographs were taken from each plot center, in each of the cardinal directions, for documentary purposes. Dominant cover type was noted as hardwood, softwood or mixed wood, and average mature overstory (co-dominant) height (where overstory was present) was measured. Within the 100 m^2 plot, an ocular estimate was made for percent cover of live crown, brush/slash, wood chips, rock outcrops and coarse woody debris.

Photo: 3. Laying out a 10 x10 m plot

The stand where the plot was located in was categorized as one of the following categories:

- Witness stand intact;
- Witness stand with damage;
- Disturbed stand, natural regeneration;
- Disturbed stand, planted; and
- Disturbed stand, thinned.

Abundance of vegetation was measured at 3 strata:

- Trees: > 5 m height
  - Tally for individual living species with BAF2 prism
  - Tally for snags (by species) with BAF2 prism
- Advanced growth (Trees and woody shrubs): 1 to 5 m height
  - Percent cover of each species within 100 m^2 plot
  - Mean height of each species within 100 m^2 plot
  - Percent of each species cover comprised of multiple stems
  - Stem density of each species within four 1 m^2 subplots
- Regeneration: <1 m height
  - Stem density of each species within four 1 m^2 subplots

Photo: 4. Using tree calipers to lay out a 1x 1 m subplot

Where prominent, exotic trees were encountered during sampling, either individually or in stands, these were georeferenced.

2.4.2 Qualitative Sampling

While plot sampling focused on quantitative measurements, the delineated Sampling Units were also assessed qualitatively. Qualitative observations were made on the following attributes:

- Dominant native species (list);
- Dominant exotic species (list);
- Live canopy (presence/absence);
- Understory or regeneration (presence/absence);
- Forest floor trampling (presence/absence);
- Exposed site (yes/no); and
- Thinning required (yes/no).

2.5 Crusher Dust Migration

All trails in the park were walked and areas of significant crusher dust migration were georeferenced. Location and migration distance from edge of trail was recorded for each incident observed. Results were exported to GIS for mapping and analysis.

2.6 Wetland Delineation

A number of vernal pools, wetlands, and low lying areas identified at a coarse level using LiDAR data were located on the ground and delineated using handheld GPS. Results were exported to GIS for mapping and analysis. A 5 m buffer was delineated around each of the wetlands identified.

2.7 Archaeological Features

Archaeological features/ sites of concern were compiled by Black Spruce Heritage Services. These were provided as tabular point locations (UTM), and were migrated to GIS for mapping purposes. Conspicuous earthworks and rock-walls were delineated coarsely as polygons using LiDAR and aerial photography. These polygons were subsequently ground-truthed. A number of rather inconspicuous features remained as point data. A 5 m buffer was delineated around each of the archaeological features provided. Where clusters of point features occurred, these were amalgamated into a single larger polygon.

2.8 Views and Sight-lines

A number of views and sight-lines were identified within the Comprehensive Plan. These views and lines were visited in the Park and assessed with regard to the level of effort (forest management) required to either achieve or maintain each view.

2.9 Data Collection and Determining

2.9.1 Date Record Sheets

Both quantitative (Plot sampling) and qualitative data (stand dominants, exotics, ground cover) was collected using custom-designed record sheets (see Appendix A). Record sheets were field tested and refined prior to sampling to ensure that the data collected was in fact what was needed for analysis purposes.

Photo: 5. Sampling in the Park's forest

2.9.2 GIS Integration

All tabular data and center points from plot sampling, as well as georeferenced points, lines and polygons from all ancillary surveys were migrated to a Geographic Information System (GIS) workstation for spatial analysis and cartographic production.

2.9.3 Sampling Frequency and Timing and Limitation

Seventy-one 100 m^2 plots were recorded, exceeding the targeted 1% sampling. Because sampling was conducted in March, plant identification was limited to trees and shrubs; herbaceous vegetation was not recorded. Tree identification was done by morphological means, including that of bud and twig. Appendix B presents a list of the species identified within the Park.