

Prince George Timber Supply Area Deciduous Vegetation Resources Inventory

Statistical Analysis and Adjustment

**FIA Numbers:
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EXECUTIVE SUMMARY

The Prince George (PG) Timber Supply Area (TSA) forest cover inventory is based on photo-interpreted inventory attribute estimates. Stakeholders in the TSA require a separate adjustment of the operable deciduous leading polygons to provide more reliable attribute estimates for deciduous species. These stand types exist in both the Fort St. James (FSJ) and Prince George (PG) Forest Districts.

The Net Volume Adjustment Factor (NVAF) sampling program was completed during the 2009 field season and the ratios were calculated by Timberline Natural Resource Group Ltd. (Timberline).

Height, age, basal area, stems per hectare, Lorey height, and total live net merchantable volume were adjusted following Ministry of Forests and Range (MFR) VRI adjustment methods.

The target population represents components of the FSJ and PG Forest District target populations as defined in the separate VRI programs.¹ In 2008 the deciduous target population was defined as the operable and deciduous leading polygons in both Forest Districts. In the FSJ Forest District the deciduous component used for this analysis was approximately 88,000 ha. In the PG Forest District the deciduous component used for this analysis was approximately 114,000 ha. The total deciduous target population represents approximately 202,200 ha. The target population was stratified by maturity class into the following two strata:

1. Immature – 80 years or less.
2. Mature – 81 years or greater.

After adjustment, **height did not change and age decreased by 17%. Basal area decreased by 7% and stems per hectare increased by 8%. The overall impact on site index was an increase of 10% and Lorey height decreased by 7%. The current Phase I live volume increased by approximately 16%.** The sampling error for the volume adjustment was $\pm 15.5\%$ (95% probability)

The main source of uncertainty in the inventory is variability in the volume in the Immature stratum. The sampling error for this stratum was approximately $\pm 29\%$ which is relatively high compared to the Mature stratum ($\pm 19\%$).

The recommendations from this project are that the adjusted height, age, basal area, stems per hectare, Lorey height, and volume for the deciduous population be used in TSR3.

¹ Timberline Natural Resource Group Ltd., 2010. *Prince George Forest District Vegetation Resources Inventory – Statistical Analysis and Adjustment*. January 2010. 63 p.

Timberline Natural Resource Group Ltd., 2010. *Fort St. James Forest District Vegetation Resources Inventory – Statistical Analysis and Adjustment*. January 2010. 68 p.

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1.0 INTRODUCTION

1.1 Vegetation Resources Inventory Overview

The Vegetation Resources Inventory (VRI) is the Ministry of Forests and Range's (MFR) forest inventory standard on public lands in BC. Where possible, forest licensees must use the VRI standard in their Data Package submission for Timber Supply Review (TSR).

The VRI is a four-step process (Figure 1):

1. Phase I (unadjusted inventory data) – Estimates of polygon attributes are derived for the target population, usually from photo-interpretation.
2. Phase II (ground sample data) – Measurements are taken from randomly located ground samples in the target population.
3. Net Volume Adjustment Factor (NVAF) sampling – Random trees are selected for stem-analysis from the Phase II samples to develop adjustment ratios that correct taper and decay estimation bias.
4. Statistical Adjustment Phase – The Phase I estimates are adjusted using the NVAF-corrected Phase II ground samples to provide an adjusted unbiased estimate of forest inventory attributes. The final product is an adjusted VRI database.

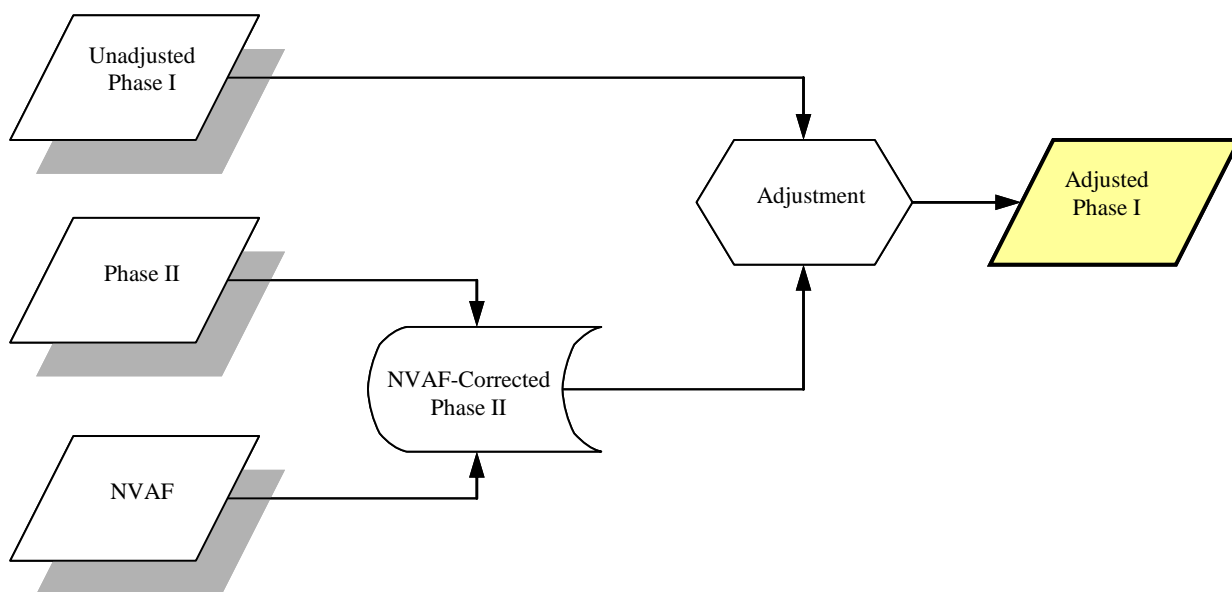


Figure 1. VRI Flow-chart.

1.2 Prince George Timber Supply Area VRI Program

The Prince George (PG) Timber Supply Area (TSA) is composed of the Vanderhoof, Fort St. James (FSJ) and PG Forest Districts. VRI programs were completely separately by these Forest Districts to reduce the size of the overall program and because timber supply analyses were analyzed separately by Forest District.

The PG TSA VRI program was initiated in 2000. The TSA Phase I was completed over three years by Timberline Natural Resource Group Ltd. (Timberline), Geowest Consultants, Arc Alpine Resource Consultants, Triathlon Forest Dimensions, and Integrated Resource Consultants (IRC). All Phase I work concluded in 2005. Forsite Consultants Ltd. and Timberline Natural Resource Group Ltd (Timberline) completed the majority of the Phase II program over the 2006 and 2007 field seasons. All Phase II sampling that occurred during the 2008 field season was completed by Terrestrial Information Systems. Twelve (12) NVAF trees were destructively sampled by McColl Forestry Ltd. in the 2009 field season and added to ten (10) existing deciduous trees destructively sampled in 2007. Timberline completed the design, NVAF analysis, and statistical adjustment of the Phase I.

1.3 Problem Statement

The PG TSA forest cover inventory is based on photo-interpreted inventory attribute estimates, which are assumed to have some bias. Stakeholders in the TSA require an adjustment of the operable deciduous leading polygons to provide more reliable attribute estimates for deciduous species. These stand types exist in both the FSJ and PG Forest Districts.

1.4 Project and Report Objectives

The project objectives were to:

1. *Compile the VRI Phase II (ground data) samples located in the deciduous target population to MFR standards;*
2. *Complete a statistical adjustment of the deciduous target population and report on the results; and*
3. *Deliver the adjusted data to the MFR and report on the results.*

The report objective is to:

- a. *Document the statistical adjustment procedures used in the Deciduous population;*
- b. *Identify areas of uncertainty in the data; and*
- c. *Provide recommendations for its use in TSR.*

1.5 Terms of Reference

Timberline prepared this report for the PG TSA licencees. Bruce Bradley, *RPF* (Canadian Forest Products Ltd.) was the licensee contact person. Hamish Robertson, *RPF* (Timberline) was the project manager and Hugh Carter, *MSc, RFT* (Timberline) completed the analysis and prepared

the report. The results from this report will be reviewed by the MFR Forest Analysis and Inventory Branch (FAIB) prior to use in TSR.

2.0 DATA

2.1 Land Base

The FSJ and PG Forest Districts are situated in the north-central interior of BC and cover approximately 6.6 million ha. The cities of PG and Fort St. James are the main urban centres in these Forest Districts respectively.

Deciduous stands in the FSJ and PG Forest Districts represent a strategically important component of future timber supply.

2.2 Target Population

The target population represents components of the FSJ and PG Forest District target populations as defined in the separate VRI programs.³ In 2008 the deciduous target population was defined as the operable and deciduous leading polygons in both Forest Districts. These areas were segregated from District target populations and combined to make up the deciduous population. The combined target population covers 202,000 ha; approximately 6% of the total combined area of the two Forest Districts.

Table 1. Deciduous population net down.

| Land Class | Area (ha) | % District |
|--|-----------|------------|
| <i>Total FSJ FD</i> | 3,185,198 | 100% |
| FSJ Target Population | 1,910,822 | 60% |
| FSJ Deciduous Population | 88,407 | 3% |
| Problem polygons ² | 48 | 0% |
| <i>Total PG FD</i> | 3,396,737 | 100% |
| PG Target Population | 1,529,063 | 45% |
| PG Deciduous Population | 114,323 | 3% |
| Problem Polygons | 471 | 0% |
| <i>Total Deciduous Target Population</i> | 202,211 | 6% |

2.3 Stratification

The target population was stratified based on maturity class. Stands less than 81 years (in 2007) were deemed Immature, and Mature otherwise (Table 2). The population was further substratified by site index class and samples were distributed by these substrata. Originally the target population was selected using an operability definition that resulted in split VRI polygons (operable and inoperable). For this analysis if a polygon was split it was deemed to be operable and the total polygon was used for analysis. This was done to reduce the risk of different adjustment ratios being applied to the same polygon. This resulted in slight changes in the areas of each stratum. The sampling weights were recalculated to account for these changes.

² Fifty-three (53) polygons (approximately 519 ha) in the deciduous population had the same species called twice and VDYP7 would not produce any outputs. These polygons were excluded from the target population and not used in the analysis

³ Timberline Natural Resource Group Ltd., 2009. *Prince George Forest District Vegetation Resources Inventory – Statistical Analysis and Adjustment*. March 2009. 55 p.

Timberline Natural Resource Group Ltd., 2009. *Fort St. James Forest District Vegetation Resources Inventory – Statistical Analysis and Adjustment*. March 2009. 60 p.

Approximately two thirds of the deciduous target population (64%) was located in Mature stands. Stands in the 15.0-19.0m site index class made up the majority of the population (59%). Adjustment statistics were computed at the stratum level only; sub-strata were only used for sample selection.

Table 2. 2007 stratification scenario.

| Stratum | Sub-Stratum | PG Area (ha) | FSJ Area (ha) | Total Area (ha) | % Pop. | % Stratum |
|--------------|------------------|----------------|---------------|-----------------|--------------|--------------|
| Immature | <15.0 m | 10,208 | 10,101 | 20,309 | 10.0 | 27.9 |
| | 15.0-19.9 m | 27,633 | 10,738 | 38,372 | 19.0 | 52.6 |
| | ≥20.0 m | 12,442 | 1,766 | 14,208 | 7.0 | 19.5 |
| | <i>Sub-Total</i> | <i>50,283</i> | <i>22,605</i> | <i>72,888</i> | <i>36.0</i> | <i>100.0</i> |
| Mature | <15.0 m | 7,275 | 19,700 | 26,975 | 13.3 | 20.9 |
| | 15.0-19.9 m | 41,486 | 39,249 | 80,735 | 39.9 | 62.4 |
| | ≥20.0 m | 14,808 | 6,806 | 21,614 | 10.7 | 16.7 |
| | <i>Sub-Total</i> | <i>63,569</i> | <i>65,755</i> | <i>129,323</i> | <i>64.0</i> | <i>100.0</i> |
| <i>Total</i> | | <i>113,851</i> | <i>88,360</i> | <i>202,211</i> | <i>100.0</i> | |

The overall average height, age, site index, and net merch. volumes were 22.7 m, 96 yrs, 17.3 m, and 189.4 m³/ha respectively. The Phase I averages were highest for height, age, basal area, and volume in the Mature stratum. The site index on average was very similar between the strata (Table 3).

Table 3. Phase I (photo-interpretation) inventory statistics.

| Stratum | Area (ha) | Height (m) | Age (yrs) | SI (m) | BA (m ² /ha) | SPH (trees/ha) | Lorey Ht. (m) | Vol. 12.5cm+ (m ³ /ha) |
|--------------|----------------|-------------|-----------|-------------|-------------------------|----------------|---------------|-----------------------------------|
| Immature | 72,888 | 17.9 | 61 | 17.2 | 28.6 | 1,218 | 16.4 | 126.0 |
| Mature | 129,323 | 25.5 | 115 | 17.3 | 37.5 | 703 | 23.1 | 225.1 |
| <i>Total</i> | <i>202,211</i> | <i>22.7</i> | <i>96</i> | <i>17.3</i> | <i>34.3</i> | <i>889</i> | <i>20.7</i> | <i>189.4</i> |

2.4 NVAF

A focused destructive sampling program for deciduous trees was completed during the 2009 field season. Twelve (12) trees were selected and sampled, then added to the eleven (11) existing deciduous trees previously sampled in the FSJ and PG Forest Districts (for a total of 23 deciduous trees). The data was combined to generate deciduous ratios that were applied to the three different populations. All ratios were calculated by Timberline and approved by the MFR Volume and Decay Sampling Officer (January 2010).

Table 4 provides a summary of the cruiser called Phase II volumes for deciduous and coniferous trees compared to the destructively sampled volumes as supplied by the MFR. In general, the

Phase II overstated tree volumes in all land bases.⁴ Phase II overstated the volume by approximately 5% on average (Refer to Appendix I for all deciduous NVAF trees).

Table 4. NVAF tree summary statistics.

| Original Unit | Live/Dead | Spp | No. Trees | Avg. Volume (m ³) | | | |
|--------------------------------|--------------|--------------|--------------|-------------------------------|---------------|---------------|--------------|
| | | | | VRI | NVAF | % Diff. | |
| Prince George Forest District | Live | Immature | All | 15 | 0.5107 | 0.5237 | +2.5% |
| | | Mature | Balsam | 20 | 0.3988 | 0.3793 | -4.9% |
| | | | Cedar | 12 | 1.2470 | 0.8286 | -33.6% |
| | | | Spruce | 20 | 0.9609 | 0.9672 | +0.7% |
| | Others | 15 | 0.3642 | 0.3533 | -3.0% | | |
| Dead | All | All | 25 | 0.4113 | 0.4174 | +1.5% | |
| <i>Total</i> | | <i>Total</i> | <i>107</i> | <i>0.5667</i> | <i>0.5218</i> | <i>-7.9%</i> | |
| Fort St. James Forest District | Live | Immature | All | 23 | 0.1717 | 0.1643 | -4.3% |
| | | Mature | Bl | 24 | 0.3166 | 0.3086 | -2.5% |
| | | | Pl | 23 | 0.4798 | 0.4849 | +1.1% |
| | | | Others | 23 | 0.6022 | 0.5427 | -9.9% |
| | Dead | All | All | 30 | 0.2794 | 0.2828 | +1.2% |
| <i>Total</i> | | <i>Total</i> | <i>123</i> | <i>0.3037</i> | <i>0.2964</i> | <i>-2.4%</i> | |
| Deciduous Population | Live | Immature | Deciduous | 8 | 0.1910 | 0.1704 | -10.8% |
| | | Mature | Deciduous | 15 | 0.4733 | 0.4618 | -2.4% |
| | <i>Total</i> | | <i>Total</i> | <i>23</i> | <i>0.3456</i> | <i>0.3299</i> | <i>-4.5%</i> |

Table 5. Phase II plot distribution.

| Label | No. Plots | (%) |
|---------------------------|-----------|-------------|
| Samples Established | 57 | 100% |
| Dropped ⁵ | 1 | 2% |
| Valid Plots | 56 | 98% |
| Existing PG | 13 | 23% |
| Existing FSJ | 3 | 5% |
| New PG | 19 | 34% |
| New FSJ | 21 | 38% |
| <i>Total for Analysis</i> | <i>56</i> | <i>100%</i> |

2.5 Phase II (Ground Sampling)

2.5.1 Actual Sample Size

Fifty-seven (57) plots were selected; 17 from the initial Phase II program and 40 from plots selected specifically for this program. One sample landed in a problem polygon and was dropped because Phase I attributes could not be generated in VDYP7. Therefore, 56 plots remained for analysis (Table 5). Thirteen (13) of these 56 plots were part of the original PG sample selection, and three were part of the original FSJ sample selection.

⁴ This could be due to cruiser called decay and/or volume calculation differences. An investigation of taper would need to be completed to determine if volume calculation differences were significant.

⁵ Sample 49 was located in a problem polygons as explained in Footnote #2 and dropped from the analysis.

2.5.2 Sampling Weights

Forty (40) plots were initially selected in 2008 with equal probability (i.e., each plot represented the same amount of area) and these were added to the existing 16 samples located in the deciduous population. The weights were re-computed based on the final list of plots (56) located in the target population (Table 6). Sampling weights ranged from 2,842 ha to 4,496 ha or in relative terms from 1 to 1.6. The average weight was 3,611 ha/plot or 1.3 in relative terms. The sampling weight for each individual ground sample is provided in Appendix II.

Table 6. Phase II plot sampling weights.

| Stratum | Sub-Stratum | Previously Adjusted | | |
|--------------|------------------|---------------------|-----------|-----------|
| | | Area (ha) | No. Plots | Area/Plot |
| Immature | <15.0 m | 20,309 | 6 | 3385 |
| | 15.0-19.9 m | 38,372 | 9 | 4264 |
| | ≥20.0 m | 14,208 | 5 | 2842 |
| | <i>Sub-Total</i> | 72,888 | 20 | 3,644 |
| Mature | <15.0 m | 26,975 | 6 | 4,496 |
| | 15.0-19.9 m | 80,735 | 24 | 3364 |
| | ≥20.0 m | 21,614 | 6 | 3602 |
| | <i>Sub-Total</i> | 129,323 | 36 | 3,592 |
| <i>Total</i> | | 202,211 | 56 | 3,611 |

2.5.3 Phase II Statistics

The overall average Phase II plot height, age, site index and live volume were 22.4 m, 79 yrs, 19.2 m, and 220.2 m³/ha respectively. The Mature stands in the deciduous target population had relatively higher basal areas, heights, and volumes as one would expect (Table 7). The site index was higher on average in the Immature stratum. The Phase I and Phase II data is provided in Appendix III.

Table 7. Deciduous Phase II inventory statistics.

| Stratum | n | Height (m) | Age (yrs) | SI (m) | L. Ht. (m) | BA (m ² /ha) | SPH (trees/ha) | Vol (m ³ /ha) | | |
|--------------|----|------------|-----------|--------|------------|-------------------------|----------------|--------------------------|------|-------|
| | | | | | | | | Live | Dead | Total |
| Immature | 20 | 18.2 | 56 | 20.5 | 15.0 | 23.2 | 974 | 129.2 | 7.4 | 136.6 |
| Mature | 36 | 24.5 | 91 | 18.6 | 21.7 | 37.2 | 882 | 271.5 | 26.3 | 297.8 |
| <i>Total</i> | 56 | 22.4 | 79 | 19.2 | 19.3 | 32.2 | 915 | 220.2 | 19.5 | 239.7 |

Note: Phase II (ground sampling) volume was whole-stem volume less tops, stumps, NVAF-corrected cruiser-called decay, waste, and breakage.

3.0 METHODS

3.1 Phase I Projection

The photo-interpretation for both the PG and FSJ Forest Districts was based on photos taken between 1959 and 2004. The majority of the Phase II plots (42 of 56 plots) were sampled in 2008 and all polygons were projected to 2008. The photo-interpreted age was projected to 2008 by adding the required number of years. The photo-interpreted height, stocking class, and corresponding net merchantable volume were projected to 2008 using VDYP7 (version 7.5c.27). The model did not project BA, SPH, or volume where heights were less than 7.6m so these polygons were assumed to have no volume, BA, stems per hectare. All other critical VDYP7 inputs (species composition, crown closure, forest inventory zone, inventory standard, and BGC) were not modified.

3.2 NVAF

The NVAF ratios were generated by Timberline in January 2010 and approved by the MFR Volume and Decay Officer. Ratios were computed using the design-based method and applied to the Phase II net merchantable volume computed from the raw data. Twelve (12) deciduous trees were destructively sampled during the 2009 field season to account for decay differences in deciduous trees. These trees were pooled together with the eleven (11) existing deciduous trees sampled in the FSJ and PG Forest Districts. Deciduous ratios were computed for both the PG and FSJ Forest Districts combined. All appropriate weights were applied for the design-based method and approved by the MFR Volume and Decay officer on December 23rd 2009.

Coniferous ratios calculated for the Fort St. James and Prince George Forest Districts were applied to the conifer trees in the deciduous population samples depending on which Forest District the sample was located. No dead deciduous trees were sampled and no deciduous dead ratios were generated. The dead ratios calculated for the conifer trees were applied to dead trees based on the Forest District in which they were located.

3.3 Phase II Compilation

The Phase II (ground sampling) data was compiled using the MFR SAS VRI Phase II compiler.⁶ Dead trees (standing and fallen) were recorded in all auxiliary plots. The plot type_cd⁷ attribute was changed in the samples established prior to 2008 to initiate the proper compilation of this dead tree information. It was important to include dead tree attributes to get a reasonably accurate representation of the dead tree information in both Forest Districts. Auxiliary plot inclusion in the cluster was based on the crew decision at ground sampling time. It is therefore possible that a field crew identified an auxiliary plot as inside (or outside) the sampled polygon despite the polygon boundary indicating the opposite.

⁶ The SAS compiler was supplied by the MFR on February 4, 2009.

⁷ Based on communication with Gitte Churlish the type_cd was changed to "Nxx" to allow for the proper compilation of this dead tree information.

3.4 Statistical Adjustment

The most recent MFR VRI statistical adjustment standards⁸ were used to adjust height, age, basal area (7.5cm+), stems per hectare (7.5cm+), Lorey height (12.5cm+), and live net merchantable volume (12.5cm+). The MFR adjustment procedures assume that the unadjusted (Phase I) inventory volume is biased due to two sources of error:

1. An attribute bias associated with the photo-interpreted height, age, basal area, and stems per hectare; and
2. A model bias inherent to the growth and yield model used to estimate volume (VDYP7).

Three critical attributes needed for volume prediction are not adjusted in the process but are important for determination of other critical attributes. The “inventory standard” attribute determines how basal area and stems per hectare are either used or generated, BGC zones are important for estimating volume loss and are needed for every polygon, and species composition is used to distribute the volume. Leaving species composition unadjusted is assumed to create a negligible bias.

The interim attribute adjustment procedure is a two-step process (Figure 2) described as follows:

- Step 1: Phase I height, age, basal area (7.5cm+), and stems per hectare (7.5cm+) bias are corrected using an adjustment ratio of means (ROM) calculated from the Phase I and Phase II plots. An attribute-adjusted volume is then estimated using VDYP7 with the adjusted height and age.
- Step 2: An adjustment ratio estimated from the attribute-adjusted volume (12.5cm+) and the NVAF-corrected Phase II volume is calculated and this ratio is used to correct the model bias in the attribute-adjusted volume.
- Step 2b: An adjustment ratio estimated from the attribute-adjusted Lorey height (12.5cm+) and the Phase II Lorey height (all live trees including ones with broken tops [i.e., ht_mean1])⁹ is calculated and this ratio is used to correct the model bias in the attribute-adjusted Lorey height.

⁸ Ministry of Forests and Range. 2008. *Vegetation Resources Inventory Interim Procedures and Standards for Statistical Adjustment of Baseline VRI Timber Attributes*. Unpublished Report, January 2008. 36 pp.

⁹ As instructed by Sam Otukol in an e-mail communication December 16, 2009.

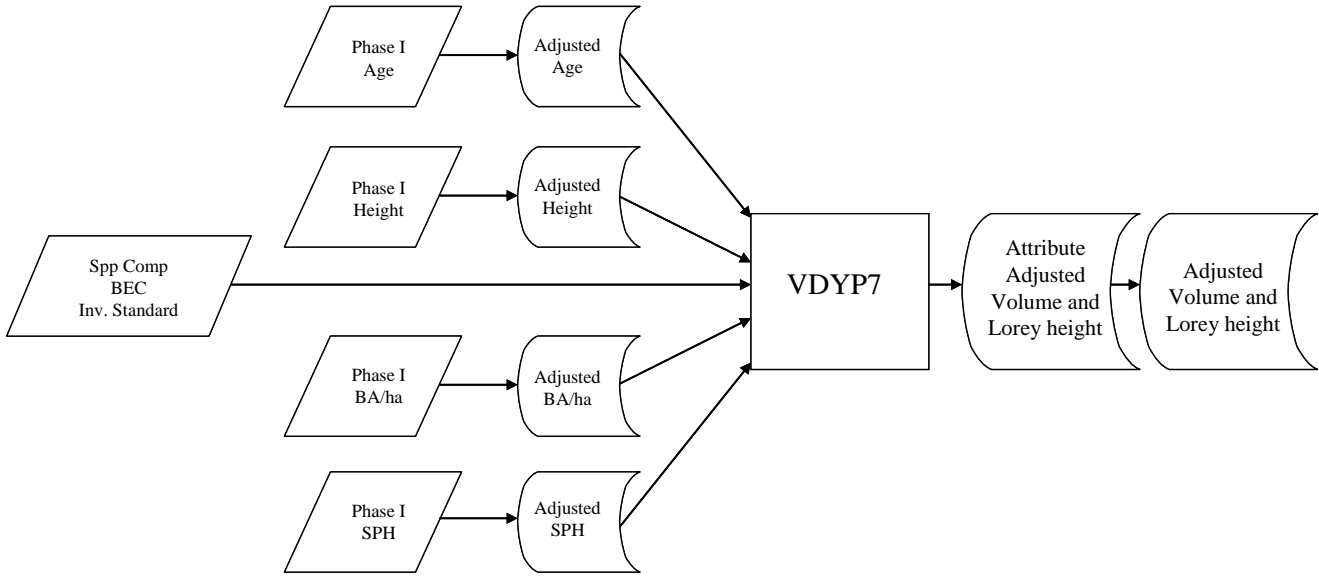


Figure 2. Interim procedures for adjustment of baseline VRI timber attributes.

4.0 RESULTS

4.1 NVAF

The average NVAF ratio for live deciduous trees was 0.892 for the Immature stratum and 0.976 for the Mature stratum, with an overall average of 0.938 (Table 8). The overall 95% sampling error (E%) for live deciduous trees was 16.5%. The individual deciduous stratum sampling errors were determined to be too high for any level of comfort and the overall average ratio (0.938) was applied to all deciduous trees. Conifer ratios were applied based on species group and Forest District.

Table 8. NVAF ratios

| Live/ Dead | Prince George ¹⁰ | | | | | Fort St James ¹¹ | | | | | Deciduous | | | | | | |
|---------------|-----------------------------|------------|--------------|------------|--------------|-----------------------------|--------------|------------|--------------|-----------|--------------|-------------|-----------|------|----|-------|------|
| | Spp | n | Ratio | 95% E% | | Spp | n | Ratio | 95% E% | | n | Ratio | 95% E% | | | | |
| Live | Imm. | All | 15 | 1.026 | 9.9 | Imm. | All | 23 | 0.957 | 11 | Imm. | 8 | 0.892 | 22.5 | | | |
| | | Mat. | Bl | 20 | 0.951 | | 7.8 | Mat. | Bl | 24 | | 0.975 | 8.8 | Mat. | 15 | 0.976 | 25.6 |
| | | Cw | 12 | 0.664 | 43.9 | | Pl | 23 | 1.011 | 3.6 | | | | | | | |
| | | S | 20 | 1.007 | 3.6 | | O | 23 | 0.901 | 11 | | | | | | | |
| | | O | 15 | 0.97 | 13.8 | | | | | | | | | | | | |
| Dead | All | All | 25 | 1.015 | 7.4 | All | All | 30 | 1.012 | 5.3 | | | | | | | |
| Total | Total | 107 | 0.958 | 4.4 | Total | 123 | 0.981 | 3.8 | Total | 23 | 0.938 | 16.5 | | | | | |

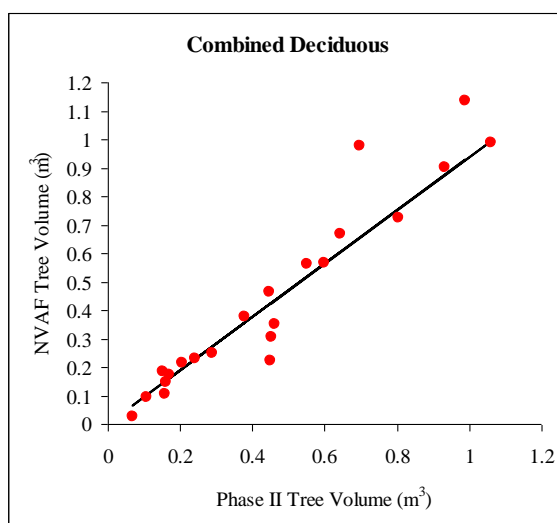


Figure 3. NVAF scatterplots.

¹⁰ Graphs and full analysis can be found Timberline Natural Resource Group Ltd., 2010. *Prince George Forest District Vegetation Resources Inventory – Statistical Analysis and Adjustment*. January 2010. 63 p.

¹¹ Graphs and full analysis can be found in Timberline Natural Resource Group Ltd., 2010. *Fort St. James Forest District Vegetation Resources Inventory – Statistical Analysis and Adjustment*. January 2010. 68 p.

4.2 Height

Ten (10) plots had no suitable height observation, leaving 46 plots for analysis. On average, there was no appreciable height difference between the Phase I and Phase II height estimates; the overall sampling error was 6% (Table 9, Figure 4). In the Immature stratum, height was underestimated in Phase I on average by approximately 8%.

Table 9. Height adjustment statistics for the target population.

| Stratum | Unadjusted Pop. | | Sample | | | ROM | Adjusted. Population | | |
|--------------|-----------------|-------------|-----------|-------------|--------------|--------------|----------------------|---------------|------------|
| | Area (ha) | Avg. (m) | n | Phase I (m) | Phase II (m) | | Adj. Avg. (m) | 95% E (m) (%) | |
| Immature | 72,888 | 17.9 | 14 | 16.8 | 18.0 | 1.076 | 19.3 | 2.9 | 14.9 |
| Mature | 129,323 | 25.5 | 32 | 25.1 | 24.5 | 0.976 | 24.9 | 1.4 | 5.5 |
| <i>Total</i> | <i>202,211</i> | <i>22.7</i> | <i>46</i> | <i>22.1</i> | <i>22.1</i> | <i>1.004</i> | <i>22.8</i> | <i>1.3</i> | <i>5.7</i> |

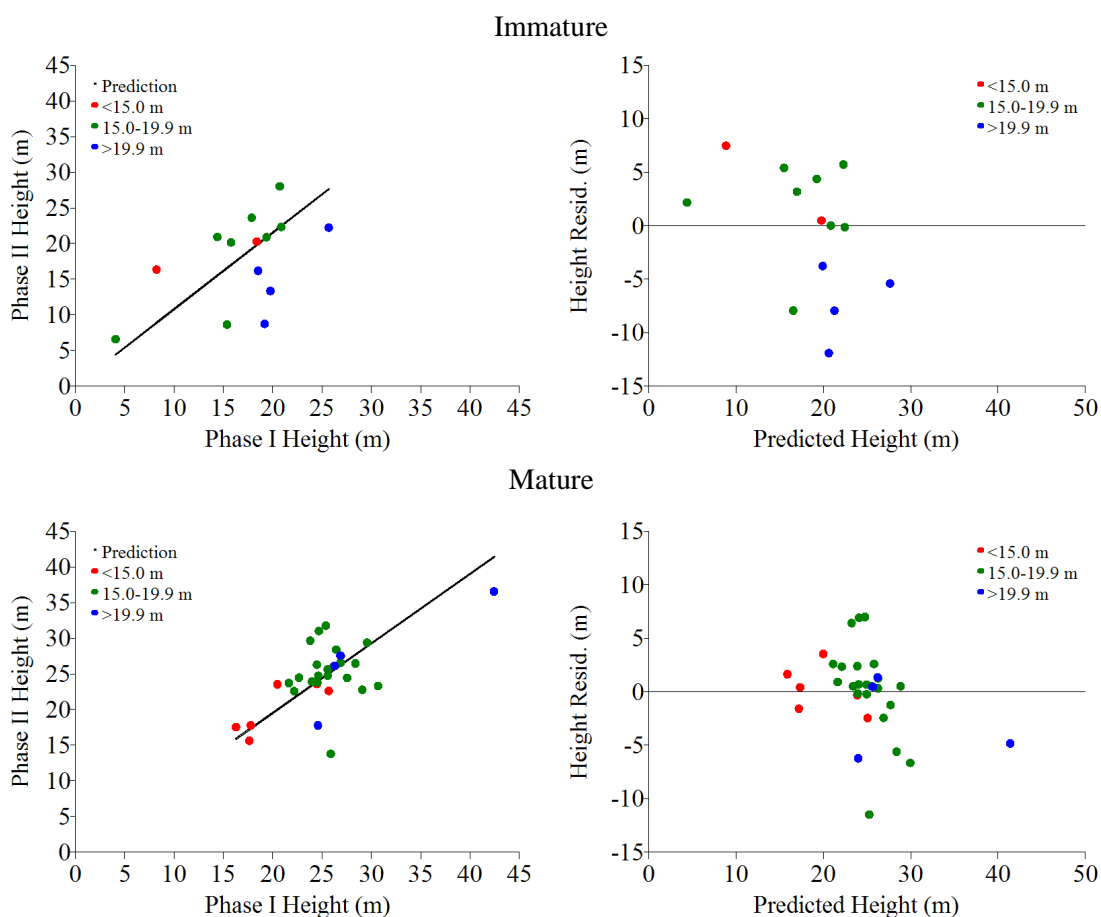


Figure 4. Height scatterplots by stratum.

4.3 Age

Ten (10) plots had no suitable age observation, leaving 46 plots for analysis. Phase I Age was over-estimated on average by approximately 17% (Table 10, Figure 5). Age in Immature stands with was over-estimated by almost 20%. The overall sampling error was $\pm 9\%$ (95% probability).

Table 10. Age adjustment statistics for the target population.

| Stratum | Unadjusted Pop. | | Sample | | | ROM | Adjusted Pop. | | |
|--------------|-----------------|------------|-----------|---------------|----------------|--------------|-----------------|-----------------|------------|
| | Area (ha) | Avg. (yrs) | n | Phase I (yrs) | Phase II (yrs) | | Adj. Avg. (yrs) | 95% E (yrs) (%) | |
| Immature | 72,888 | 61 | 14 | 57 | 55 | 0.964 | 59 | 8 | 12.8 |
| Mature | 129,323 | 115 | 32 | 116 | 91 | 0.791 | 91 | 11 | 12.1 |
| Total | 202,211 | 96 | 46 | 95 | 78 | 0.831 | 80 | 7 | 9.3 |

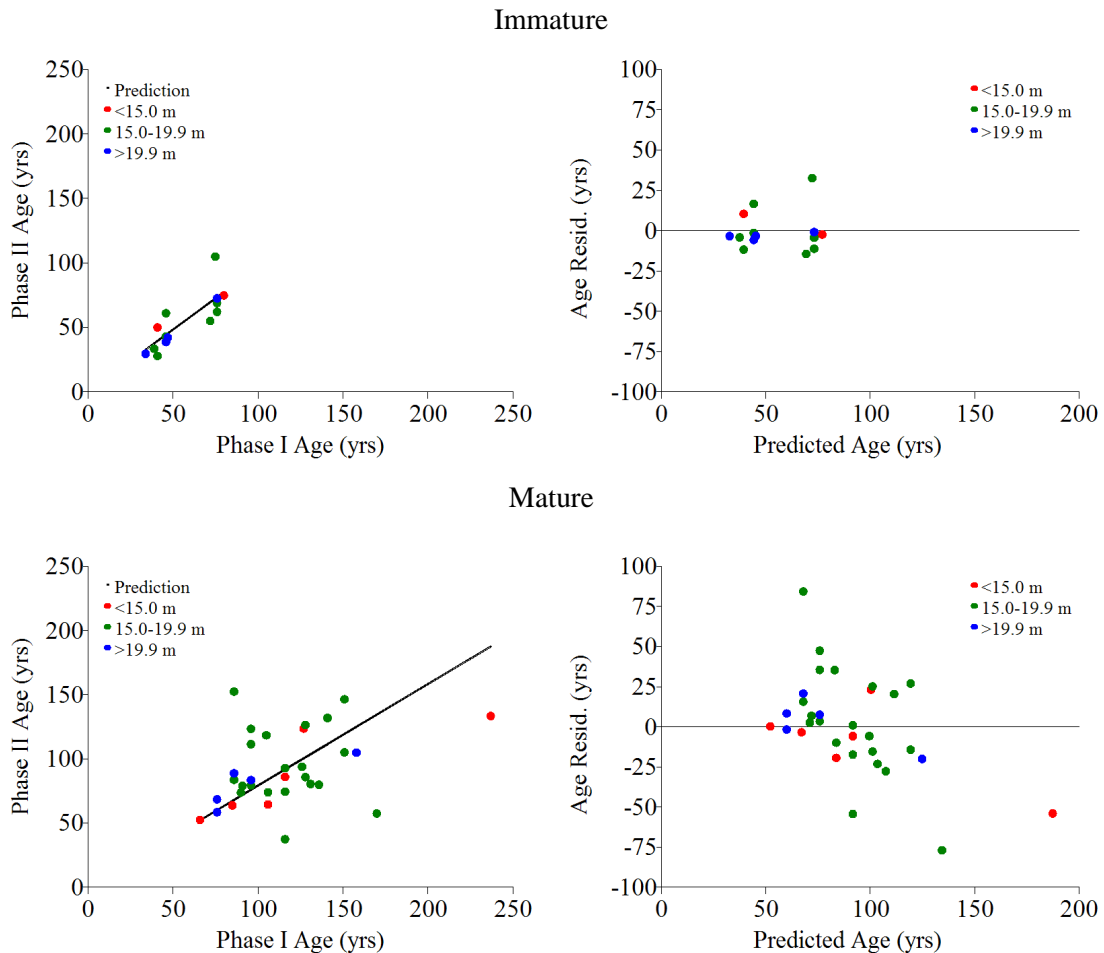


Figure 5. Age scatterplots by stratum.

4.4 Basal Area

Fifty-six (56) samples were used for the basal area analysis. Phase I basal area was over-estimated on average by approximately 7% (Table 11, Figure 6). Basal area in Immature stands was over-estimated by approximately 12%. The overall sampling error was 13% (95% probability).

Table 11. Basal area adjustment statistics for the target population.

| Stratum | Unadjusted Pop. | | n | Sample | | ROM | Adjusted Pop. | | |
|--------------|-----------------|---------------------------|-----------|------------------------------|-------------------------------|--------------|--------------------------------|--------------------------------|-------------|
| | Area (ha) | Avg. (m ² /ha) | | Phase I (m ² /ha) | Phase II (m ² /ha) | | Adj. Avg. (m ² /ha) | 95% E (m ² /ha) (%) | |
| Immature | 72,888 | 28.6 | 20 | 26.5 | 23.2 | 0.876 | 25.0 | 6.0 | 24.1 |
| Mature | 129,323 | 37.5 | 36 | 39.3 | 37.2 | 0.946 | 35.5 | 5.7 | 15.9 |
| <i>Total</i> | <i>202,211</i> | <i>34.3</i> | <i>56</i> | <i>34.7</i> | <i>32.2</i> | <i>0.925</i> | <i>31.8</i> | <i>4.1</i> | <i>13.0</i> |

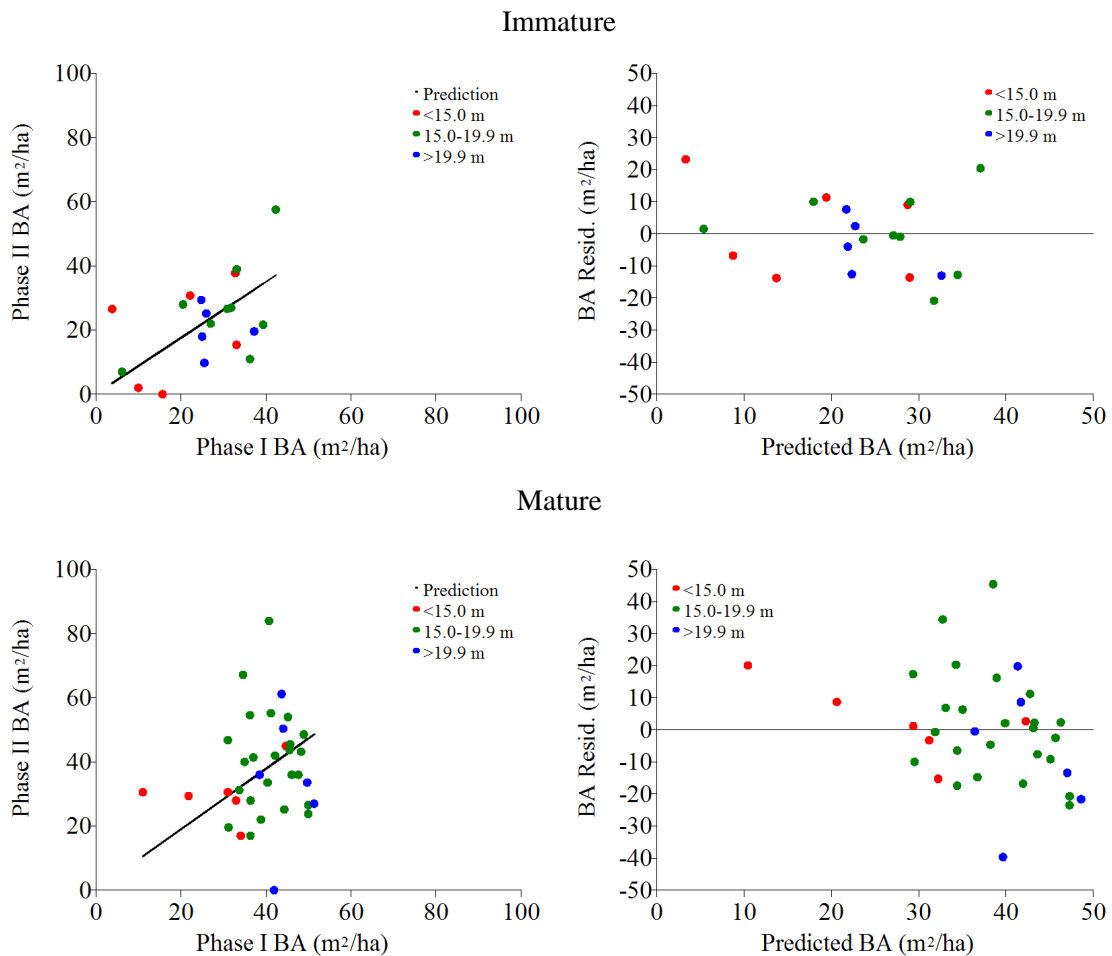


Figure 6. Basal area (7.5cm+) live only scatterplots by stratum.

4.5 Stems per hectare

Fifty-six (56) samples were used for the stems per hectare analysis. Phase I stems per hectare was under-estimated on average by approximately 8% (Table 12, Figure 7). Basal area in Mature stands was under-estimated by approximately 24%. The overall sampling error was approximately 19% (95% probability).

Table 12. Stems per hectare adjustment statistics for the target population.

| Stratum | Unadjusted Pop. | | n | Sample | | ROM | Adjusted Pop. | | |
|--------------|-----------------|-----------------|-----------|--------------------|---------------------|--------------|----------------------|----------------------|-------------|
| | Area (ha) | Avg. (trees/ha) | | Phase I (trees/ha) | Phase II (trees/ha) | | Adj. Avg. (trees/ha) | 95% E (trees/ha) (%) | |
| Immature | 72,888 | 1,218 | 20 | 1,079 | 974 | 0.903 | 1,100 | 316 | 28.7 |
| Mature | 129,323 | 703 | 36 | 709 | 882 | 1.243 | 874 | 222 | 25.4 |
| <i>Total</i> | <i>202,211</i> | <i>889</i> | <i>56</i> | <i>843</i> | <i>915</i> | <i>1.075</i> | <i>955</i> | <i>178</i> | <i>18.6</i> |

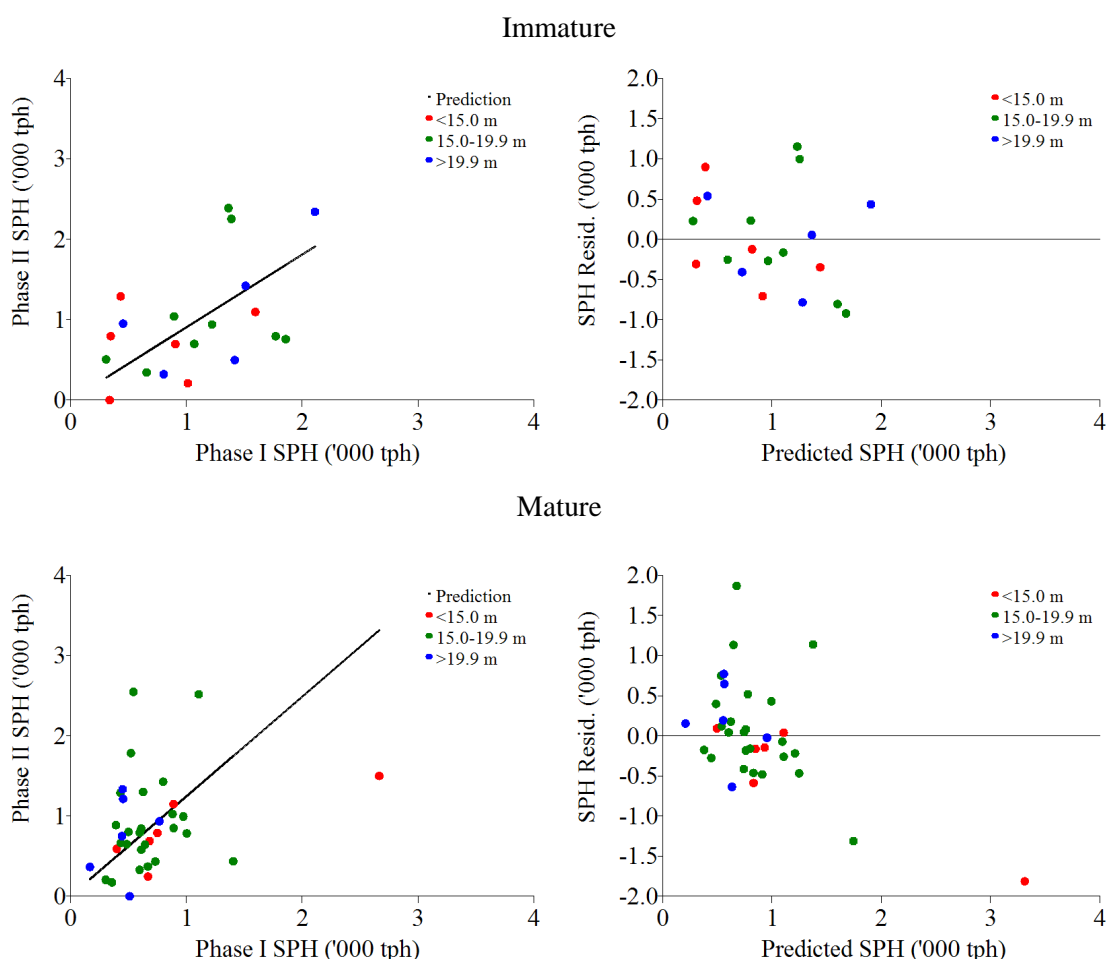


Figure 7. Stems per hectare (7.5cm+) live only scatterplots by stratum.

4.6 Input-Adjusted Lorey Height

After adjusting the bias in height, age, basal area, and stems per hectare, VDYP7 Lorey heights were re-estimated using the adjusted input (Table 13). Attribute-adjusted Lorey heights decreased 0.8%. These attribute-adjusted Lorey heights reflect the changes in basal area and stems per hectare across the deciduous population.

Table 13. Lorey Height change due to input attributes adjustment.

| Stratum | Area (ha) | Vol. (m ³ /ha) 12.5+ using live only | | | |
|--------------|----------------|---|--------------------|-------------|-------------|
| | | Phase I | Attribute-Adjusted | Diff. (m) | (%) |
| Immature | 72,888 | 16.4 | 17.2 | +0.8 | +5.2 |
| Mature | 129,323 | 23.1 | 22.4 | -0.7 | -3.2 |
| <i>Total</i> | <i>202,211</i> | <i>20.7</i> | <i>20.6</i> | <i>-0.2</i> | <i>-0.8</i> |

4.7 Input-adjusted VDYP7 Volume

After adjusting the bias in height, age, basal area, and stems per hectare, VDYP7 volumes were re-estimated using the adjusted input. Attribute-adjusted volumes decreased by 4% when compared to the Phase I volumes (Table 14). These attribute-adjusted volumes reflect the relatively small decrease in overall basal area.

Table 14. Volume change due to input attributes adjustment.

| Stratum | Area (ha) | Vol. (m ³ /ha) 12.5+ using live only | | | |
|--------------|----------------|---|--------------------|-------------|-------------|
| | | Phase I | Attribute-Adjusted | Diff. (m) | (%) |
| Immature | 72,888 | 126.0 | 120.7 | -5.3 | -4.2 |
| Mature | 129,323 | 225.1 | 216.9 | -8.1 | -3.6 |
| <i>Total</i> | <i>202,211</i> | <i>189.4</i> | <i>182.2</i> | <i>-7.1</i> | <i>-3.8</i> |

4.8 Site Index

Site index is not directly adjusted in the VRI standard statistical adjustment. Instead, an adjusted site index is derived from adjusted height and age. The inventory leading species site index increased by approximately 10% after adjustment (Table 15). The increases were consistent amongst

Table 15. Site index change after adjustment.

| Stratum | Area (ha) | Site Index (m) | Adj. Site Index (m) | Difference (%) |
|--------------|----------------|----------------|---------------------|----------------|
| Immature | 72,888 | 17.2 | 18.9 | +10.1 |
| Mature | 129,323 | 17.3 | 18.9 | +9.2 |
| <i>Total</i> | <i>202,211</i> | <i>17.3</i> | <i>18.9</i> | <i>+9.5</i> |

strata and there was very little difference when comparing the strata average site index.

4.9 Lorey Height

All fifty-six (56) samples were used for the Lorey height analysis. The Lorey height decreased by approximately 6% after adjustment (Table 16, Figure 8). The largest decrease in Lorey Height was evident in the Immature stratum where it decreased by approximately 14% with a sampling error of $\pm 18\%$ (95% confidence). The adjusted average Lorey height was approximately 19m. The overall sampling error was approximately $\pm 7\%$ (95% probability).

Table 16. Lorey height (12.5cm+) adjustment statistics.

| Stratum | Attr. Adj. Lorey Ht. | | Sample | | | | Adjusted Population | | |
|--------------|----------------------|-------------|-----------|-------------|--------------|--------------|---------------------|------------|------------|
| | Area (ha) | Avg. (m) | n | Phase I (m) | Phase II (m) | ROM | Adj. Avg. (m) | 95% E | |
| | | | | | | | | (m) | (%) |
| Immature | 72,888 | 17.2 | 20 | 17.5 | 15.0 | 0.856 | 14.8 | 2.7 | 18.0 |
| Mature | 129,323 | 22.4 | 36 | 22.3 | 21.7 | 0.972 | 21.8 | 1.7 | 8.0 |
| Total | 202,211 | 20.6 | 56 | 20.6 | 19.3 | 0.937 | 19.3 | 1.4 | 7.4 |

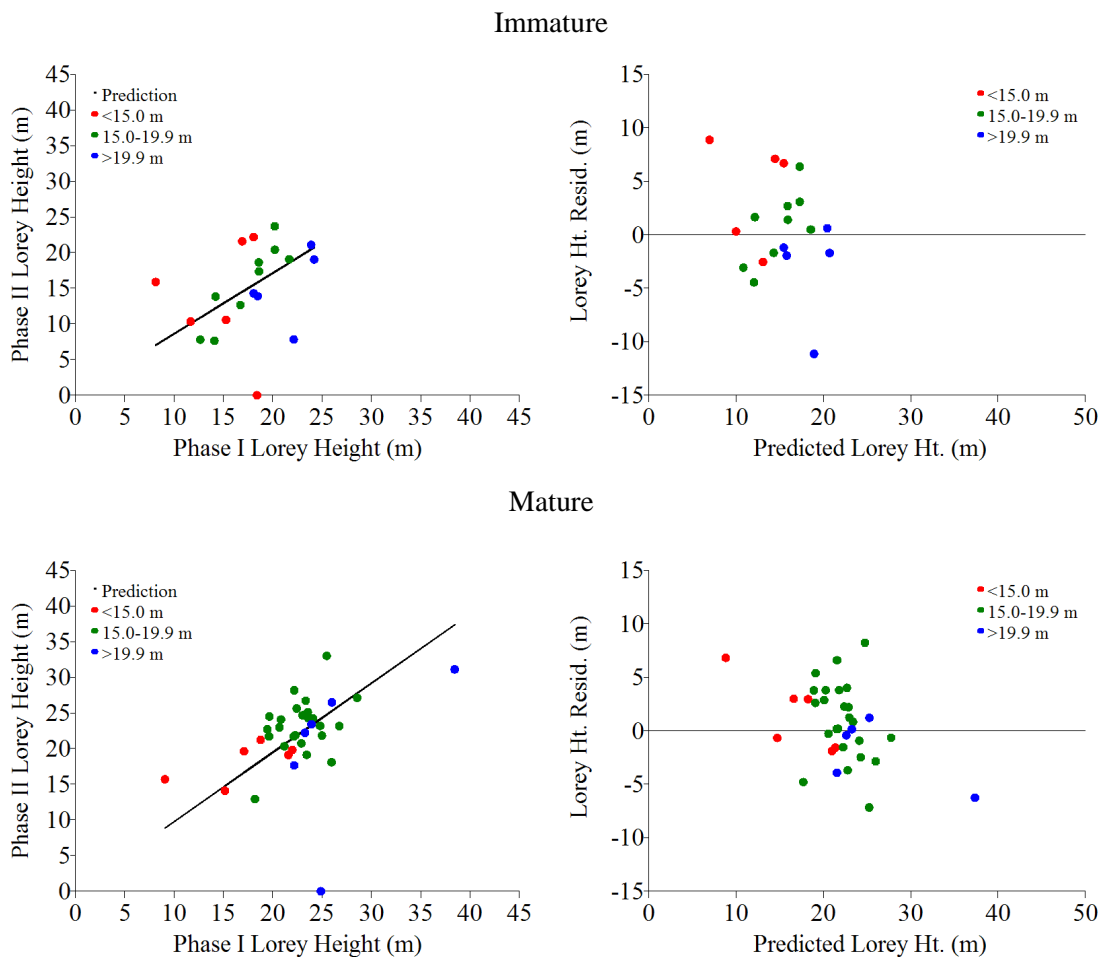


Figure 8. Lorey height (12.5cm+) scatterplots by stratum.

4.10 Unadjusted vs. Adjusted Lorey Height

After adjustment, the Phase I Lorey Height decreased by 7% (Table 17). The decrease was largest in the Immature stratum where Lorey height decreased by 10%.

Table 17. Unadjusted and adjusted Lorey height (m).

| Stratum | Area (ha) | Lorey Height (12.5cm+) | | | |
|--------------|----------------|------------------------|-------------|-------------|--------------|
| | | Unadj. (m) | Adj. (m) | Diff. (m) | Diff. (%) |
| Immature | 72,888 | 16.4 | 14.8 | -1.6 | -10.0% |
| Mature | 129,323 | 23.1 | 21.8 | -1.4 | -5.9% |
| Total | 202,211 | 20.7 | 19.3 | -1.5 | -7.0% |

4.11 Live Net Merchantable Volume

All fifty-six (56) samples were used for the volume analysis. The live net merchantable volume increased by approximately 17% after adjustment (Table 18, Figure 9). Adjustment ratios were very consistent between strata; however the sampling error for the Immature stratum was almost twice as high as the Mature. The adjusted average live volume/ha was approximately 213 m³/ha. The expected sampling error was approximately ±19% (based on 56 samples and an estimated CV of 70%) and the overall sampling error was approximately ±16% (95% probability).

Table 18. Net merchantable volume (12.5cm+) adjustment statistics.

| Stratum | Attr. Adj. Vol. | | Sample | | | Adjusted Population | | | |
|--------------|-----------------|---------------------------|-----------|------------------------------|-------------------------------|---------------------|--------------------------------|----------------------------|-------------|
| | Area (ha) | Avg. (m ³ /ha) | n | Phase I (m ³ /ha) | Phase II (m ³ /ha) | ROM | Adj. Avg. (m ³ /ha) | 95% E (m ³ /ha) | 95% E (%) |
| Immature | 72,888 | 120.7 | 20 | 110.4 | 129.2 | 1.171 | 141.3 | 41.6 | 29.4 |
| Mature | 129,323 | 216.9 | 36 | 232.2 | 271.5 | 1.169 | 253.6 | 47.9 | 18.9 |
| Total | 202,211 | 182.2 | 56 | 188.3 | 220.2 | 1.170 | 213.1 | 33.5 | 15.7 |

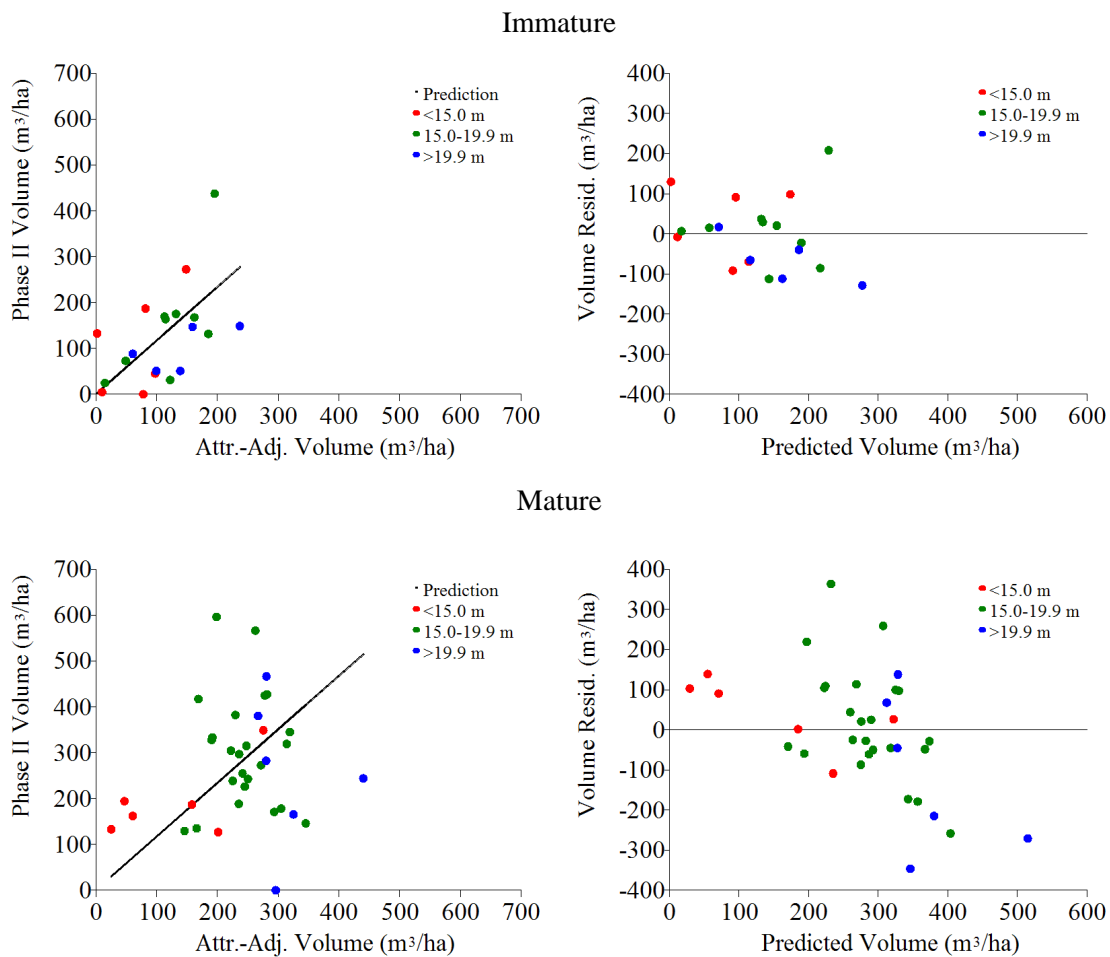


Figure 9. Volume (12.5cm+) scatterplots by stratum.

4.12 Unadjusted vs. Adjusted Volume

After adjustment, the live net merch Phase I inventory volume increased by 13% (Table 19). The increase was largest in the Mature stratum where the volume increased by approximately 13%.

Table 19. Unadjusted and adjusted live net merch volume (m³/ha).

| Stratum | Area (ha) | Volume (12.5cm+) | | | |
|--------------|----------------|------------------|--------------|----------------------------|--------------|
| | | Unadjusted | Adjusted | Diff. (m ³ /ha) | Diff. (%) |
| Immature | 72,888 | 126.0 | 141.3 | 15.3 | 12.1% |
| Mature | 129,323 | 225.1 | 253.6 | 28.5 | 12.7% |
| <i>Total</i> | <i>202,211</i> | <i>189.4</i> | <i>213.1</i> | <i>23.7</i> | <i>12.5%</i> |

5.0 DISCUSSION

5.1 Sample vs. Population

A sample must adequately cover the range of Phase I values in the population to avoid extrapolating information to areas that were not sampled (given that all samples had a chance of being sampled). A minimal amount of extrapolation will be required with a random sample since the minimum and maximum values observed in the population will not always be included in the sample. With a random sample of size n , one would expect on average that $100\%/2n$ of the population is below or above the minimum or maximum observed in the sample.

Table 20. Population outside of the sampled range.

| Stratum | Expected Proportion | Age | | Height | | Volume | |
|----------|---------------------|-------|-------|--------|-------|--------|-------|
| | | Below | Above | Below | Above | Below | Above |
| Immature | 2.5 | 10.8 | 0.0 | 1.5 | 0.0 | 1.7 | 0.2 |
| Mature | 1.6 | 0.1 | 4.9 | 0.1 | 0.2 | 0.2 | 1.4 |

Small portions of area were outside of the expected proportion for all attributes for all variables (Table 20). A significant portion of area was outside the sampled area for age in the Immature stratum, meaning that there is the potential for biased estimates for this attributes in the areas of the strata. Areas not covered for volume in the deciduous target population were below the expected values.

5.2 Accuracy and Precision

The statistical adjustment provides unbiased estimates at the scale in which the ratios were computed. In the case of the deciduous population, unbiased estimates will be at the stratum level. There is always a possibility that local bias exists within a stratum. It would be inappropriate to estimate sub-stratum bias given the small sample size provided at a smaller scale.

Based on a sample size of 56 samples with an assumed coefficient of variation of 70%, the expected sampling error for the deciduous area was $\pm 19\%$ (95% probability).¹² The overall sampling error achieved in this project was lower than anticipated ($\pm 15.7\%$).

¹² Timberline Natural Resource Group Ltd., 2008. *Prince George Forest District Vegetation Resources Inventory Project Implementation Plan – Addendum for Deciduous Sampling*. Unpublished. 7 p.

Timberline Natural Resource Group Ltd., 2008. *Fort St. James Forest District Vegetation Resources Inventory Project Implementation Plan – Addendum for Deciduous Sampling*. Unpublished. 7 p.

5.3 Risks and Uncertainties

5.3.1 Immature Stratum

The overall sampling error (16%) for the deciduous population was lower than expected (19%) which provides the necessary level of comfort in the adjustment for this part of the population. However when the stratum sampling errors are examined the Immature stratum is almost twice as variable as the Mature stratum and is likely due to the relatively small sample size (20).

5.3.2 Age Trend

The statistical adjustment removes the bias in each stratum. It is however possible that within each stratum an age-related trend exists which could become a source of concern in TSR. All residuals were plotted against stand age to detect any age-related trend and none were identified.

6.0 CONCLUSIONS

Following adjustment the overall average site index increased from 17.3m to 18.9m and the live merchantable volume increased by 30.6 m³/ha, height did not change and age decreased by 17%. Basal area decreased by 7% and stems per hectare increased by 8%. The overall impact on site index was an increase of 10%. The Lorey height decreased by approximately 7%. The current Phase I live volume increased by approximately 13%. The sampling error for the volume adjustment was $\pm 15.7\%$ (95% probability).

The main source of uncertainty in the inventory is the variability in the volume for the Immature stratum. The sampling error for this stratum was approximately $\pm 29\%$ which means which is relatively high compared to the Mature stratum ($\pm 19\%$).

6.1 Recommendations

A statistical adjustment was completed for the deciduous components of the PG and FSJ Forest Districts using the standard MFR methodology. Unbiased estimates of height, age, basal area, stems per hectare, and volume were obtained using the VRI statistical adjustment methods. These estimates represent the best available inventory estimates. Therefore, we recommend that:

The PG and FSJ Forest District stakeholders use the adjusted estimates of height, age, basal area, stems per hectare and volume for the deciduous population in future TSR.

The Phase II data collected for CWD and forest health agents provides insight into the forest health issues within the target population. Therefore, we recommend that:

The stakeholders consider the available Phase II data for CWD and forest health and use it to do more in-depth analyses and guide other initiatives.

The Phase II data collected on the TSA contains a rich set of information that can be used for a variety of broad scale strategic planning. Therefore, we recommend that:

The stakeholders consider using this data to help future planning.

APPENDIX I – NVAF SAMPLE LIST

Table 21. NVAF tree list in the Deciduous Population.

| Project ID | Live/ Dead | Species Group | Sample | Plot | Tree No. | Species | DBH (cm) | Age (yrs) | Volume (m ³) | | Total Weight |
|------------|------------|---------------|--------|------|----------|---------|----------|-----------|--------------------------|--------|--------------|
| | | | | | | | | | NVAF | VRI | |
| DJA1 | Live | Immature | 0201 | N | 002 | EP | 18.8 | 84 | 0.2158 | 0.2062 | 9,867,180 |
| DJA1 | Live | Immature | 0201 | W | 001 | AT | 18.1 | 165 | 0.0274 | 0.0685 | 7,772,673 |
| DJA1 | Live | Immature | 0201 | W | 002 | AT | 20.7 | 64 | 0.0951 | 0.1081 | 3,888,638 |
| DPG1 | Live | Immature | 0049 | N | 007 | EP | 29.5 | 39 | 0.3777 | 0.3769 | 26,225,750 |
| DPG1 | Live | Immature | 0049 | S | 003 | EP | 19.9 | 40 | 0.1058 | 0.1584 | 71,695,266 |
| DPG1 | Live | Immature | 0049 | S | 004 | EP | 20.0 | 42 | 0.1729 | 0.1705 | 59,621,278 |
| DPG1 | Live | Immature | 0095 | N | 008 | EP | 21.5 | 25 | 0.1460 | 0.1618 | 17,467,553 |
| DPG1 | Live | Immature | 0301 | W | 001 | AC | 25.4 | 48 | 0.2505 | 0.2501 | 5,409,923 |
| 024D | Live | Mature | 0004 | E | 003 | AT | 27.3 | 75 | 0.5634 | 0.5515 | 2,930,989 |
| 024D | Live | Mature | 0004 | S | 001 | AT | 29.5 | 77 | 0.6665 | 0.6432 | 2,414,009 |
| 024D | Live | Mature | 0004 | W | 002 | AT | 23.3 | 79 | 0.3040 | 0.4517 | 7,648,201 |
| 024D | Live | Mature | 0004 | W | 003 | AT | 36.6 | 84 | 0.9892 | 1.0603 | 3,124,080 |
| 024D | Live | Mature | 0004 | W | 005 | AT | 35.5 | 83 | 0.9012 | 0.9312 | 3,211,950 |
| 024D | Live | Mature | 0014 | N | 003 | AT | 35.6 | 152 | 0.7261 | 0.8045 | 2,258,525 |
| 024D | Live | Mature | 0014 | W | 001 | AT | 26.7 | 107 | 0.4639 | 0.4476 | 3,977,079 |
| 024D | Live | Mature | 0014 | W | 003 | AT | 21.4 | 105 | 0.2242 | 0.4510 | 6,237,884 |
| 024D | Live | Mature | 0014 | W | 006 | AT | 21.9 | 85 | 0.2505 | 0.2894 | 6,063,407 |
| DJA1 | Live | Mature | 0003 | E | 002 | AT | 18.9 | 79 | 0.2314 | 0.2416 | 41,588,195 |
| DJA1 | Live | Mature | 0003 | E | 004 | AT | 28.7 | 98 | 0.5645 | 0.5993 | 17,904,609 |
| DPG1 | Live | Mature | 0005 | W | 004 | AT | 33.2 | 109 | 0.9781 | 0.6982 | 31,985,999 |
| DPG1 | Live | Mature | 0069 | W | 003 | AT | 46.0 | 166 | 1.1343 | 0.9893 | 8,677,211 |
| DPG1 | Live | Mature | 0081 | S | 002 | AT | 23.0 | 79 | 0.1862 | 0.1533 | 20,440,508 |
| DPG1 | Live | Mature | 0085 | S | 001 | AT | 26.3 | 112 | 0.3515 | 0.4626 | 85,883,563 |

Note: Volume is whole-stem volume less top, stump, decay, and waste.

APPENDIX II – PHASE II SAMPLING WEIGHTS & PLOT LOCATIONS

Table 22. Deciduous Phase II sampling weights and plot locations.

| Proj. ID | Sample No. | Zone | Easting | Northing | Stratum | Substratum | Sampling Weight |
|----------|------------|------|---------|----------|----------|-------------|-----------------|
| 024D | 0001 | 10 | 547290 | 5969119 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0002 | 10 | 371056 | 6051213 | Mature | <15.0 m | 4,496 |
| 024D | 0003 | 10 | 519163 | 6073361 | Mature | ≥20.0 m | 3,602 |
| 024D | 0004 | 10 | 525119 | 6046335 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0005 | 10 | 553811 | 5981166 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0006 | 10 | 556740 | 5993376 | Immature | ≥20.0 m | 2,842 |
| 024D | 0007 | 10 | 520323 | 6006645 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0008 | 9 | 611242 | 6243814 | Mature | ≥20.0 m | 3,602 |
| 024D | 0009 | 10 | 311807 | 6135572 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0010 | 9 | 552216 | 6302589 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0011 | 10 | 404324 | 6034355 | Immature | <15.0 m | 3,385 |
| 024D | 0012 | 10 | 426555 | 6026879 | Immature | ≥20.0 m | 2,842 |
| 024D | 0013 | 10 | 513186 | 6006148 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0014 | 10 | 439283 | 6021937 | Mature | <15.0 m | 4,496 |
| 024D | 0015 | 10 | 317106 | 6149176 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0016 | 10 | 488706 | 5942248 | Immature | ≥20.0 m | 2,842 |
| 024D | 0017 | 10 | 547196 | 5950574 | Immature | 15.0-19.9 m | 4,263 |
| 024D | 0018 | 9 | 600600 | 6239650 | Immature | <15.0 m | 3,385 |
| 024D | 0019 | 10 | 439157 | 6019037 | Mature | <15.0 m | 4,496 |
| 024D | 0020 | 10 | 491978 | 6086949 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0021 | 10 | 514455 | 6073563 | Immature | 15.0-19.9 m | 4,263 |
| 024D | 0022 | 9 | 686144 | 6152828 | Mature | ≥20.0 m | 3,602 |
| 024D | 0023 | 10 | 214628 | 6318308 | Mature | <15.0 m | 4,496 |
| 024D | 0024 | 10 | 422787 | 6076878 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0025 | 9 | 682543 | 6148061 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0026 | 10 | 506855 | 6085713 | Mature | ≥20.0 m | 3,602 |
| 024D | 0027 | 10 | 339422 | 6075724 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0028 | 10 | 572180 | 6040219 | Immature | ≥20.0 m | 2,842 |
| 024D | 0029 | 10 | 347917 | 6049396 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0030 | 10 | 395140 | 6056397 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0031 | 10 | 365587 | 6085036 | Immature | 15.0-19.9 m | 4,263 |
| 024D | 0032 | 10 | 532430 | 6097749 | Mature | <15.0 m | 4,496 |

PG TSA Deciduous VRI Statistical Adjustment

| Proj. ID | Sample No. | Zone | Easting | Northing | Stratum | Substratum | Sampling Weight |
|----------|------------|------|---------|----------|----------|-------------|-----------------|
| 024D | 0033 | 10 | 562770 | 5951515 | Immature | 15.0-19.9 m | 4,263 |
| 024D | 0034 | 10 | 399641 | 6035052 | Immature | <15.0 m | 3,385 |
| 024D | 0035 | 10 | 530540 | 6070064 | Immature | 15.0-19.9 m | 4,263 |
| 024D | 0036 | 10 | 480128 | 5975991 | Immature | <15.0 m | 3,385 |
| 024D | 0037 | 10 | 529943 | 6037010 | Mature | 15.0-19.9 m | 3,364 |
| 024D | 0038 | 10 | 400996 | 6083215 | Mature | <15.0 m | 4,496 |
| 024D | 0039 | 10 | 354699 | 6174533 | Immature | <15.0 m | 3,385 |
| 024D | 0040 | 10 | 529569 | 6077526 | Immature | 15.0-19.9 m | 4,263 |
| DJA1 | 0104 | 9 | 686367 | 6135994 | Mature | 15.0-19.9 m | 3,364 |
| DJA1 | 0201 | 10 | 352777 | 6076159 | Immature | <15.0 m | 3,385 |
| DJA1 | 0203 | 10 | 388427 | 6068214 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0002 | 10 | 518921 | 5950372 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0019 | 10 | 551431 | 5958200 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0035 | 10 | 531041 | 5971312 | Immature | 15.0-19.9 m | 4,263 |
| DPG1 | 0040 | 10 | 504081 | 6081613 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0047 | 10 | 507621 | 6070636 | Immature | 15.0-19.9 m | 4,263 |
| DPG1 | 0057 | 10 | 525612 | 6081398 | Mature | ≥20.0 m | 3,602 |
| DPG1 | 0065 | 10 | 528457 | 6077474 | Immature | 15.0-19.9 m | 4,263 |
| DPG1 | 0067 | 11 | 496033 | 6085577 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0068 | 10 | 515626 | 5960141 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0069 | 10 | 465575 | 5928603 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0079 | 10 | 538702 | 5965272 | Mature | 15.0-19.9 m | 3,364 |
| DPG1 | 0088 | 10 | 508044 | 5998454 | Mature | ≥20.0 m | 3,602 |
| DPG1 | 0132 | 10 | 514546 | 5948863 | Immature | ≥20.0 m | 2,842 |

APPENDIX III – PHASE I & II DATA

Table 23. Deciduous Phase I data from sampled polygons.

| Proj. ID | Sample No. | Origin FD | Area (ha) | Spp1 | Ht1 (m) | Age1 (yrs) | SI1 (m) | BA (m ² /ha) | SPH (trees/ha) | Spp2 | Ht2 (m) | Age2 (yrs) | SI2 (m) | Case | Lorey Height 12.5cm+ (m) | | Volume 12.5cm+ (m ³ /ha) | |
|----------|------------|-----------|-----------|------|---------|------------|---------|-------------------------|----------------|------|---------|------------|---------|------|--------------------------|--------------------|-------------------------------------|--------------------|
| | | | | | | | | | | | | | | | Unadjusted | Attribute Adjusted | Unadjusted | Attribute Adjusted |
| 024D | 0001 | PG | 16.0 | SW | 32.7 | 140 | 18.7 | 36.4 | 306 | AT | 32.5 | 126 | 22.4 | 3 | 29.4 | 28.6 | 300.5 | 293.7 |
| 024D | 0002 | FSJ | 32.0 | SW | 25.7 | 156 | 11.5 | 34.1 | 671 | AT | 24.5 | 116 | 16.2 | 2 | 22.5 | 22.0 | 207.2 | 201.5 |
| 024D | 0003 | PG | 14.7 | AT | 26.9 | 86 | 21.0 | 44.1 | 456 | | | | 1 | 24.8 | 24.0 | 274.2 | 267.3 | |
| 024D | 0004 | PG | 13.1 | AT | 22.7 | 96 | 16.3 | 47.7 | 1,006 | PL | 22.6 | 96 | 17.1 | 1 | 20.4 | 19.7 | 230.2 | 222.6 |
| 024D | 0005 | PG | 13.8 | AC | 29.6 | 116 | 19.7 | 50.0 | 360 | SW | 28.9 | 116 | 17.9 | 3 | 26.4 | 25.5 | 319.2 | 305.4 |
| 024D | 0006 | PG | 22.8 | AT | 24.6 | 61 | 22.8 | 26.0 | 457 | EP | 19.8 | 51 | 20.3 | 5 | 22.3 | 23.9 | 164.9 | 159.3 |
| 024D | 0007 | PG | 7.7 | SXW | 24.7 | 131 | 16.1 | 48.3 | 394 | AT | 28.4 | 136 | 18.2 | 1 | 24.5 | 20.9 | 299.9 | 248.1 |
| 024D | 0008 | FSJ | 7.2 | AC | 42.4 | 158 | 30.4 | 49.7 | 169 | SX | 43.8 | 158 | 28.4 | 3 | 39.8 | 38.5 | 453.3 | 440.6 |
| 024D | 0009 | FSJ | 18.1 | AT | 24.4 | 128 | 15.4 | 48.9 | 1,109 | BL | 22.2 | 128 | 12.0 | 2 | 21.4 | 20.7 | 261.2 | 250.5 |
| 024D | 0010 | FSJ | 7.8 | AT | 21.3 | 85 | 16.2 | 38.8 | 893 | SX | 25.9 | 170 | 10.7 | 4 | 18.9 | 18.2 | 174.8 | 166 |
| 024D | 0011 | FSJ | 26.3 | EP | 15.0 | 61 | 13.8 | 33.1 | 1,598 | AT | 17.1 | 61 | 15.6 | 5 | 14.1 | 15.3 | 99.4 | 97.8 |
| 024D | 0012 | FSJ | 2.2 | AT | 19.8 | 46 | 21.6 | 24.8 | 2,112 | SW | 20.8 | 56 | 22.9 | 3 | 17.2 | 18.5 | 65.2 | 60.9 |
| 024D | 0014 | FSJ | 27.8 | AT | 18.7 | 86 | 14.0 | 11.1 | 401 | SW | 17.8 | 66 | 17.2 | 4 | 17.6 | 17.1 | 52.7 | 47.2 |
| 024D | 0015 | FSJ | 53.9 | AT | 28.7 | 151 | 17.7 | 40.4 | 645 | PL | 28.4 | 151 | 19.3 | 4 | 25.6 | 25.0 | 274.6 | 272.1 |
| 024D | 0017 | PG | 19.4 | AT | 14.7 | 41 | 17.5 | 36.3 | 1,224 | SW | 15.4 | 39 | 25.8 | 4 | 13.2 | 14.1 | 128.4 | 122.6 |
| 024D | 0018 | FSJ | 25.1 | AT | 18.3 | 80 | 14.3 | 32.8 | 907 | PLI | 18.4 | 80 | 14.9 | 2 | 17.0 | 18.1 | 156.1 | 148.7 |
| 024D | 0019 | FSJ | 4.9 | AT | 20.6 | 106 | 13.8 | 31.1 | 752 | PL | 20.5 | 106 | 14.6 | 4 | 19.4 | 18.8 | 167.7 | 158.4 |
| 024D | 0020 | PG | 13.8 | AT | 25.6 | 116 | 17.1 | 34.6 | 488 | SXW | 27.2 | 96 | 19.1 | 1 | 22.8 | 22.2 | 204.4 | 198.8 |
| 024D | 0021 | PG | 21.5 | AT | 18.9 | 76 | 15.1 | 27.0 | 660 | PL | 17.9 | 76 | 14.9 | 4 | 17.3 | 18.6 | 118.1 | 114.9 |

| Proj. ID | Sample No. | Origin FD | Area (ha) | Spp1 | Ht1 (m) | Age1 (yrs) | SI1 (m) | BA (m ² /ha) | SPH (trees/ha) | Spp2 | Ht2 (m) | Age2 (yrs) | SI2 (m) | Case | Lorey Height 12.5cm+ (m) | | Volume 12.5cm+ (m ³ /ha) | |
|----------|------------|-----------|-----------|------|---------|------------|---------|-------------------------|----------------|------|---------|------------|---------|------|--------------------------|--------------------|-------------------------------------|--------------------|
| | | | | | | | | | | | | | | | Unadjusted | Attribute Adjusted | Unadjusted | Attribute Adjusted |
| 024D | 0022 | FSJ | 18.3 | AC | 29.6 | 96 | 21.7 | 38.5 | 446 | SW | 26.3 | 96 | 18.5 | 4 | 26.8 | 26.0 | 291.0 | 280.4 |
| 024D | 0023 | FSJ | 21.7 | AT | 10.4 | 107 | 6.4 | 33.0 | 2,667 | BL | 16.3 | 237 | 4.1 | 2 | 9.4 | 9.1 | 36.9 | 25.4 |
| 024D | 0024 | FSJ | 9.2 | AT | 26.5 | 126 | 17.2 | 31.1 | 628 | SW | 28.8 | 126 | 16.6 | 1 | 24.2 | 23.5 | 198.7 | 192 |
| 024D | 0025 | FSJ | 8.3 | AT | 30.7 | 151 | 19.4 | 36.4 | 598 | SW | 32.0 | 151 | 17.1 | 1 | 27.5 | 26.8 | 248.0 | 245.5 |
| 024D | 0026 | PG | 15.7 | AT | 26.9 | 86 | 21.0 | 43.7 | 452 | SXW | 25.7 | 76 | 21.8 | 2 | 24.0 | 23.3 | 290.9 | 281.1 |
| 024D | 0027 | FSJ | 12.8 | AT | 24.6 | 105 | 17.1 | 31.2 | 670 | | | | | 3 | 21.9 | 21.2 | 149.3 | 146.1 |
| 024D | 0028 | PG | 15.1 | EP | 22.1 | 37 | 20.7 | 25.0 | 1,514 | S | 19.2 | 34 | 34.5 | 2 | 14.4 | 22.2 | 78.9 | 139 |
| 024D | 0029 | FSJ | 7.1 | AT | 25.6 | 90 | 19.4 | 37.0 | 613 | EP | 21.5 | 90 | 15.9 | 1 | 22.8 | 22.2 | 245.1 | 236 |
| 024D | 0030 | FSJ | 6.5 | AT | 29.1 | 128 | 19.3 | 50.0 | 600 | PL | 27.5 | 128 | 19.4 | 1 | 26.8 | 26.0 | 346.9 | 345.7 |
| 024D | 0031 | FSJ | 9.9 | AT | 20.7 | 75 | 16.9 | 42.3 | 895 | SW | 23.1 | 85 | 17.7 | 1 | 18.8 | 20.2 | 200.4 | 195.8 |
| 024D | 0032 | PG | 10.6 | EP | 22.9 | 127 | 14.3 | 44.7 | 685 | SX | 25.7 | 127 | 14.1 | 4 | 22.4 | 21.6 | 290.2 | 275.9 |
| 024D | 0033 | PG | 16.0 | AT | 12.5 | 41 | 15.0 | 6.2 | 309 | SW | 4.1 | 41 | 9.4 | 4 | 11.8 | 12.7 | 15.8 | 15.1 |
| 024D | 0034 | FSJ | 7.7 | EP | 16.9 | 66 | 14.7 | 15.7 | 340 | SW | 22.3 | 91 | 16.0 | 4 | 17.0 | 18.4 | 79.1 | 78.2 |
| 024D | 0035 | PG | 5.2 | AT | 17.6 | 46 | 19.3 | 33.2 | 1,366 | SXW | 15.8 | 46 | 22.4 | 2 | 15.6 | 16.8 | 137.8 | 132.1 |
| 024D | 0036 | PG | 42.3 | PL | 8.3 | 41 | 11.3 | 3.8 | 435 | AT | 8.0 | 41 | 10.2 | 3 | 7.6 | 8.2 | 2.4 | 2.2 |
| 024D | 0037 | PG | 14.7 | AT | 21.7 | 91 | 15.9 | 44.4 | 1,406 | PL | 21.7 | 91 | 16.7 | 1 | 20.3 | 19.7 | 254.7 | 235.6 |
| 024D | 0038 | FSJ | 13.2 | AT | 17.7 | 85 | 13.2 | 21.8 | 892 | SW | 19.1 | 85 | 14.3 | 1 | 15.7 | 15.2 | 69.1 | 60.9 |
| 024D | 0039 | FSJ | 7.2 | AT | 11.9 | 50 | 12.6 | 10.0 | 1,015 | PLI | 16.5 | 150 | 9.4 | 4 | 10.9 | 11.7 | 11.0 | 10.2 |
| 024D | 0040 | PG | 10.7 | AT | 20.3 | 67 | 17.6 | 31.8 | 1,860 | EP | 19.5 | 62 | 17.7 | 5 | 17.4 | 18.6 | 118.8 | 113.1 |
| DJA1 | 0104 | FSJ | 18.2 | AT | 26.9 | 121 | 17.9 | 46.1 | 976 | SW | 29.3 | 141 | 15.6 | 1 | 23.8 | 22.9 | 248.7 | 241.6 |
| DJA1 | 0201 | FSJ | 6.8 | AT | 16.8 | 65 | 14.7 | 22.2 | 349 | EP | 15.8 | 65 | 13.9 | 5 | 15.7 | 16.9 | 84.2 | 81.8 |
| DJA1 | 0203 | FSJ | 20.1 | AT | 26.9 | 136 | 17.0 | 36.3 | 801 | SW | 25.8 | 131 | 13.7 | 1 | 24.3 | 23.4 | 171.0 | 169.1 |
| DPG1 | 0002 | PG | 12.0 | AT | 27.6 | 116 | 18.8 | 45.7 | 883 | PLI | 25.6 | 96 | 19.8 | 4 | 24.8 | 24.1 | 325.3 | 314.4 |

| Proj. ID | Sample No. | Origin FD | Area (ha) | Spp1 | Ht1 (m) | Age1 (yrs) | SI1 (m) | BA (m ² /ha) | SPH (trees/ha) | Spp2 | Ht2 (m) | Age2 (yrs) | SI2 (m) | Case | Lorey Height 12.5cm+ (m) | | Volume 12.5cm+ (m ³ /ha) | |
|----------|------------|-----------|-----------|------|---------|------------|---------|-------------------------|----------------|------|---------|------------|---------|------|--------------------------|--------------------|-------------------------------------|--------------------|
| | | | | | | | | | | | | | | | Unadjusted | Attribute Adjusted | Unadjusted | Attribute Adjusted |
| DPG1 | 0013 | PG | 4.2 | AT | 27.6 | 106 | 19.6 | 41.2 | 503 | PL | 28.5 | 106 | 21.6 | 1 | 25.6 | 24.8 | 284.3 | 278.2 |
| DPG1 | 0016 | PG | 25.4 | AT | 25.0 | 76 | 20.6 | 37.2 | 807 | SW | 25.7 | 76 | 21.8 | 4 | 22.5 | 24.2 | 244.6 | 237.1 |
| DPG1 | 0019 | PG | 19.5 | EP | 20.7 | 86 | 15.6 | 35.0 | 432 | SW | 25.4 | 86 | 19.3 | 4 | 20.2 | 19.5 | 198.3 | 190.7 |
| DPG1 | 0035 | PG | 7.3 | EP | 14.4 | 46 | 15.9 | 20.5 | 1,390 | SW | 14.3 | 41 | 22.9 | 3 | 13.1 | 14.2 | 50.3 | 49.2 |
| DPG1 | 0040 | PG | 18.0 | EP | 23.8 | 86 | 18.3 | 33.7 | 613 | BL | 22.4 | 76 | 18.6 | 3 | 23.2 | 22.5 | 235.7 | 225.6 |
| DPG1 | 0047 | PG | 15.2 | AT | 20.9 | 76 | 16.9 | 39.4 | 1,070 | SXW | 18.9 | 66 | 18.3 | 1 | 18.8 | 20.2 | 190.3 | 185.4 |
| DPG1 | 0057 | PG | 10.4 | AT | 25.9 | 86 | 20.1 | 51.4 | 770 | SXW | 24.6 | 76 | 20.8 | 4 | 22.9 | 22.2 | 339.9 | 325.5 |
| DPG1 | 0065 | PG | 25.4 | EP | 21.3 | 67 | 18.6 | 31.0 | 1,773 | SX | 19.4 | 72 | 17.2 | 2 | 19.9 | 21.7 | 163.4 | 162.3 |
| DPG1 | 0067 | PG | 24.7 | AT | 26.6 | 106 | 18.8 | 45.2 | 523 | SXW | 26.2 | 96 | 18.4 | 2 | 24.4 | 23.7 | 288.1 | 282.2 |
| DPG1 | 0068 | PG | 21.7 | SW | 27.9 | 116 | 17.0 | 45.6 | 734 | EP | 24.5 | 116 | 16.2 | 4 | 23.8 | 23.1 | 333.6 | 319.8 |
| DPG1 | 0069 | PG | 15.2 | AT | 26.4 | 151 | 15.8 | 42.2 | 436 | SW | 24.7 | 141 | 12.0 | 4 | 24.3 | 23.6 | 227.3 | 229.9 |
| DPG1 | 0079 | PG | 4.8 | EP | 22.6 | 106 | 15.4 | 40.8 | 545 | SW | 24.0 | 116 | 13.9 | 4 | 23.1 | 22.3 | 272.9 | 262.9 |
| DPG1 | 0088 | PG | 27.3 | AT | 28.9 | 86 | 22.8 | 41.9 | 512 | SW | 27.2 | 96 | 19.1 | 5 | 25.7 | 24.9 | 307.3 | 296.3 |
| DPG1 | 0132 | PG | 28.3 | AT | 18.5 | 47 | 22.0 | 25.5 | 1,419 | PL | 21.4 | 47 | 23.5 | 1 | 18.5 | 18.1 | 118.2 | 99.5 |

Table 24. Deciduous Phase II data from sampled polygons.

| Proj. ID | Sample No. | Feature ID | Species | Height (m) | Age (yrs) | Site Index (m) | Basal Area (m ² /ha) | SPH (trees/ha) | Lorey Height (m) | Volume 12.5cm+ (m ³ /ha) |
|----------|------------|----------------------------------|---------|------------|-----------|----------------|---------------------------------|----------------|------------------|-------------------------------------|
| 024D | 0001 | D6436D1F4B22E47AF27A93ADBBA195E2 | S | | | | 17.0 | 204 | 27.1 | 170.7 |
| 024D | 0002 | D2D463364FE674ACF3F2D4A87B60B115 | AT | 23.6 | 86 | 18.2 | 17.0 | 246 | 19.8 | 127.0 |
| 024D | 0003 | 59A796D349ACCA4545D0A7B3101506BE | AT | 27.6 | 89 | 21.4 | 50.4 | 1,215 | 23.4 | 380.7 |
| 024D | 0004 | D952A3C44CD5AFF40E9F64A92DD971B8 | AT | 24.5 | 80 | 19.7 | 36.0 | 784 | 24.5 | 304.8 |
| 024D | 0005 | 6630FB934FD011A8FCD4B6AA23D175C9 | ACT | 29.4 | 37 | 35.7 | 23.8 | 172 | 33.0 | 178.4 |
| 024D | 0006 | 2164305A4CA61C853901B491972AC6CE | SXW | | 54 | | 25.2 | 951 | 21.1 | 147.1 |
| 024D | 0007 | C786D96B4A03CEC17C36939E42BBABBC | SXW | 24.8 | 81 | 19.4 | 43.2 | 888 | 24.1 | 315.3 |
| 024D | 0008 | D737509249C3B9F5D0047F81F30EFA0E | ACT | 36.6 | 105 | | 33.6 | 365 | 31.1 | 244.3 |
| 024D | 0009 | E7FE53AF4632CEF05F0517BBDB69C0EB | BL | 22.6 | 127 | 12.5 | 48.6 | 2,519 | 23.0 | 242.9 |
| 024D | 0010 | 51A5F8E24399AB74B38B4EAE02319D01 | BL | 13.8 | 58 | 15.4 | 22.0 | 850 | 12.9 | 135.0 |
| 024D | 0011 | 5905E7F446C9E06DB222C6B30400ADAF | FDI | | | | 15.4 | 1,096 | 10.6 | 45.1 |
| 024D | 0012 | 56C379F946E3C93A98C0D6A69579A13A | EP | 13.4 | 39 | 17.1 | 29.4 | 2,343 | 13.9 | 88.3 |
| 024D | 0014 | 9FFBF7524F9256B30EB86D8E2FF9A735 | SXW | 17.8 | 53 | 20.3 | 30.6 | 591 | 19.6 | 194.6 |
| 024D | 0015 | CDE9BFBC4842364465F776AB6EF05D99 | PLI | 26.5 | 147 | 15.9 | 33.6 | 642 | 21.8 | 272.9 |
| 024D | 0017 | 1541C1F64C1F8FC031036CB8D8C9E013 | S | 8.7 | 34 | 17.9 | 11.0 | 941 | 7.6 | 31.0 |
| 024D | 0018 | 309E62AE4266B136DBFD52BF89BD956C | PLI | 20.3 | 75 | 18.4 | 37.8 | 696 | 22.2 | 272.7 |
| 024D | 0019 | 36D9DD324B7DB43FF41559AB8F4D57C3 | SXW | 23.6 | 65 | 21.9 | 30.6 | 789 | 21.2 | 186.9 |
| 024D | 0020 | BD9F721D45D7CE0FF52A5B8D178E1F4A | AT | | | | 67.2 | 649 | 28.2 | 596.8 |
| 024D | 0021 | F2DBDFB4468BE35C0AAEAF91DF781B98 | S | 23.7 | 69 | 20.8 | 22.0 | 343 | 17.4 | 164.1 |
| 024D | 0022 | C8D18C9E4FCCDA2C50606C90B81B11C8 | SXW | 26.2 | 84 | 19.9 | 36.0 | 749 | 26.5 | 282.6 |
| 024D | 0023 | 90A91A454396CAAC3EBA54A62F969280 | BL | 17.6 | 134 | 9.9 | 28.0 | 1,501 | 15.7 | 133.1 |
| 024D | 0024 | 7EF494FF4AE70EC2472B34AE56C3A2C9 | AT | 28.4 | 94 | 21.8 | 46.8 | 1,301 | 19.1 | 333.9 |
| 024D | 0025 | 666889D544A87855DE77F69680FFE7BB | AT | 23.3 | 105 | 16.1 | 28.0 | 330 | 23.2 | 226.4 |

| Proj. ID | Sample No. | Feature ID | Species | Height (m) | Age (yrs) | Site Index (m) | Basal Area (m ² /ha) | SPH (trees/ha) | Lorey Height (m) | Volume 12.5cm+ (m ³ /ha) |
|----------|------------|----------------------------------|---------|------------|-----------|----------------|---------------------------------|----------------|------------------|-------------------------------------|
| 024D | 0026 | 3862B4AA46CD1A387AF92097DA0B51D8 | SXW | | 69 | | 61.2 | 1,335 | 22.2 | 467.0 |
| 024D | 0027 | 138BC8AE4003720FE99D3298534F2BF1 | EP | 23.8 | 119 | 15.5 | 19.6 | 370 | 20.4 | 129.5 |
| 024D | 0028 | EFFD1D0E43E7A9A9012D29B314E11E4B | S | 8.8 | 30 | 20.6 | 17.9 | 1,421 | 7.8 | 50.9 |
| 024D | 0029 | 86A683744F7D885D82599DB4D6DBAD54 | AT | 25.7 | 74 | 21.3 | 41.4 | 844 | 21.7 | 297.2 |
| 024D | 0030 | 10CD30BB41E44DBE5B238FA6685ABADD | AT | 22.8 | 86 | 17.8 | 26.6 | 794 | 18.1 | 145.9 |
| 024D | 0031 | B80F7E83417A53EEA090F7825CB33C3C | AT | 28.1 | 105 | 21.9 | 57.6 | 1,041 | 23.7 | 438.2 |
| 024D | 0032 | D443D84C4464AFC6490467A92BA5F2A2 | BL | 22.6 | 124 | 14.5 | 45.0 | 689 | 19.1 | 349.1 |
| 024D | 0033 | 5BBF17A149AF6635A4A43B92196DEDA9 | SXW | 6.6 | 28 | 23.7 | 7.0 | 507 | 7.8 | 24.6 |
| 024D | 0034 | 9FF3795D46CFAB0A2C78CFB9EA9CB404 | PLI | | | | 0.0 | 0 | 0.0 | 0.0 |
| 024D | 0035 | FE36F3B040F4CAE53C6710A884C2561F | SXW | 20.2 | 61 | 19.9 | 39.0 | 2,389 | 12.7 | 175.3 |
| 024D | 0036 | E7A2F3484747524F7BD7C281CBD7F891 | SXW | 16.4 | 50 | 20.0 | 26.6 | 1,291 | 15.9 | 132.9 |
| 024D | 0037 | 667600834A5A7B578EA796B7881BC0E0 | AT | 23.8 | 79 | 19.0 | 25.2 | 435 | 21.7 | 188.6 |
| 024D | 0038 | 9813DA2C43672AC02379FD9873617482 | AT | 15.7 | 64 | 14.3 | 29.4 | 1,149 | 14.1 | 162.1 |
| 024D | 0039 | B15C87D34FAE8306EBAEB1B9F581B476 | BL | | | | 2.0 | 209 | 10.4 | 4.5 |
| 024D | 0040 | 8EB0E4334C3C50A044D24C9111CC0C95 | S | 20.2 | 64 | 19.4 | 27.0 | 757 | 18.6 | 169.3 |
| DJA1 | 0104 | 58F42435428B0BBA6EB0E1A1690A541F | AT | 26.6 | | | 36.0 | 994 | 20.8 | 255.4 |
| DJA1 | 0201 | 1A9B649A4C513F8B1D3ECDBB2652A9A0 | SXW | | | | 30.8 | 796 | 21.6 | 187.2 |
| DJA1 | 0203 | 538E558F420D25D433AC95BB00B5C560 | AT | 27.6 | 80 | 22.9 | 54.6 | 1,428 | 26.7 | 418.0 |
| DPG1 | 0002 | 6AB210D74538E3CBC5F40A8EACFB8CA4 | FDI | 24.8 | 112 | 16.2 | 45.5 | 1,025 | 24.3 | 319.4 |
| DPG1 | 0013 | 5F611D2D485D67122940EE966ECED4C1 | AT | 24.5 | 74 | 20.6 | 55.2 | 803 | 23.2 | 425.3 |
| DPG1 | 0016 | 8E7F82FE4C70B784D137719283A8DAF1 | SXW | 22.3 | 73 | 18.7 | 19.6 | 321 | 19.1 | 148.7 |
| DPG1 | 0019 | 4BFC782E40C1CA19C8EC3CA347B8F2B3 | SXW | 31.8 | 153 | 17.4 | 40.0 | 1,290 | 22.7 | 327.9 |
| DPG1 | 0035 | 6BF6101248DE34C25B3A3788CE346D43 | ACT | 21.0 | 43 | 24.1 | 28.0 | 2,254 | 13.9 | 72.8 |
| DPG1 | 0040 | C0AD4D9A4948D4EFBC85E79A38704CAC | AT | 29.7 | 84 | 23.8 | 31.3 | 580 | 25.7 | 238.8 |

| Proj. ID | Sample No. | Feature ID | Species | Height (m) | Age (yrs) | Site Index (m) | Basal Area (m ² /ha) | SPH (trees/ha) | Lorey Height (m) | Volume 12.5cm+ (m ³ /ha) |
|----------|------------|----------------------------------|---------|------------|-----------|----------------|---------------------------------|----------------|------------------|-------------------------------------|
| DPG1 | 0047 | 9113B35A4639B6A119EEF3BD26B33B8D | AT | 22.4 | 62 | 21.1 | 21.7 | 698 | 20.4 | 131.6 |
| DPG1 | 0057 | 92793B4644413F60436B58A019D733D7 | BL | 17.8 | 59 | 18.7 | 27.0 | 934 | 17.7 | 165.7 |
| DPG1 | 0065 | D6D2837A45723CB65F323C85A78A9F32 | SX | 20.9 | 55 | 22.5 | 26.7 | 795 | 19.1 | 167.7 |
| DPG1 | 0067 | DB14C57546F85FF8C2C6018A6746E285 | SXW | 26.1 | 124 | 14.3 | 54.0 | 1,786 | 24.3 | 427.8 |
| DPG1 | 0068 | 27A908CF401F998C5113588BE3D5DD12 | AT | 26.3 | 93 | 20.0 | 43.8 | 432 | 24.7 | 345.6 |
| DPG1 | 0069 | F509430940E333ABB979BBAAFF26F68C | SXW | 31.1 | 132 | 17.7 | 42.0 | 664 | 25.1 | 382.6 |
| DPG1 | 0079 | 1359E3324C6563FFD01A61BED699F649 | SXW | 24.0 | 75 | 19.7 | 84.0 | 2,549 | 21.9 | 566.9 |
| DPG1 | 0088 | D87059424581EAAA3438478BB2F11C08 | | | | | 0.0 | 0 | 0.0 | 0.0 |
| DPG1 | 0132 | ADB1DF5B4574F07E10DF1281F0ADB82F | AT | 16.2 | 42 | 18.6 | 9.8 | 497 | 14.3 | 51.0 |