Summary and Cruise Statistics 8

8.1 Plot Summary Report Overview

The Plot Summary reports number of stems, diameter, and merchantable volume information for the measured plots. The parameters are segregated by species within the plot. Each species is segregated by damage code for damage compilations. Refer to Appendix 1 for the list of species used. Only stem count is reported for Western Yew.

Count plots are not included in the plot summary.

Only include trees in a plot that meet the merchantability requirements from card type B.

Plots are sorted within Type, Block, and Strip.

Stems are trees with Tree Class coded 1, 2, 3, 5, 7, 8, or 9. Snags are trees with Tree Class coded either 4 or 6.

8.1.1 Header Information

1. License from card type A.
2. Cutting Permit from card type A.
3. Forest Inventory Zone from card type A.
4. Unit # and Block from card type A.

   - Report the actual name of the Unit/Block from Table 17 of the *Cruising Manual*.

5. Message indicating whether compilation is for appraisals or not.
6. Method of calculation (Average Line or Block).
7. Merchantability requirements from card type B.
8. Special compilation messages for:
   a. Reduction compilation.
   b. Stump cruise compilation.
   c. Tree class combination - useless volumes are included or excluded, depending on column 15 of card type B (0 or blank - snags excluded, 1 - snags included).

d. Selective cut indicator - which trees to compile depends on column 12 of card type B (blank - include all trees, 'C' - include cut-indicated and non-indicated trees, 'L' - include leave-indicated trees).

e. Wet/Dry belt indicator (Interior only) - sale is in the wet belt or dry belt, depending on column 14 of card type B (0 - no message, 1 - wet belt, 2 - dry belt).

9. Compiler program name and version.

10. Compile date and time.

11. Page number.

8.1.2 Plot Information

For each plot, report the following card type 9 information:

1. Type.

2. Block.

3. Strip.

4. Plot.

5. Plot size.

   - Report the plot area for fixed plots, or the basal area factor for prism plots.

   - If a sub-plot is being used, include the letter 'S' next to the plot size.

6. Plot sweep.

7. Slope percent.

8. Date.

8.1.3 Species Information

All summations in the following calculations are for the merchantable trees in a plot.

8.1.3.1 Number of Stems and Snags

Count the number of trees in the plot for the species. When compiling a reduction, apply the reduction.

If the plot is a border plot, double the number of stems and snags.

Round to the nearest whole number.

8.1.3.2 Number of Stems and Snags Per Hectare

Use the method outlined in Section 3.4 for calculating S_p for a specific species.

8.1.3.3 Average Diameter of Stems and Snags

The average diameter is derived from the basal area and stems per hectare estimates from the plot using the relationship Area = pi*radius^2. The multiplication by 100 is to convert from meters to centimeters.

$$\overline{D_p} = 100 * 2 * \sqrt{\frac{BA_p}{pi * S_p}}$$

Where:

$\overline{D_p}$ = Average diameter (cm) of stems (or snags) for plot p.

BA_p = Average basal area per hectare (m^2) for plot p (refer to Section 3.5).

S_p = Stems (or snags) per hectare for plot p (refer to Section 3.5).

pi = 3.14159265

Report to 2 decimal places.

Example 8.1

2 Fir stems were tallied in a full plot using a BAF of 12.000. PRF = 0.2887. Tree one has a DBH of 89.9 and tree two has a DBH of 78.8.

The basal area per hectare is:

BA = 2 * 12 = 24

The stems per hectare are:

$$S_p = \frac{12\,(12732.39545)}{89.9^2} + \frac{12\,(12732.39545)}{78.8^2} = 43.51$$

The average diameter is:

$$= 100 * 2 * \sqrt{\frac{24}{\text{pi} * 43.51}} = 83.80 \text{ cm}$$

8.1.3.3.1 Gross Merchantable Volume/hectare

Use the method outlined in Section 3.5 for calculating V_p for a specific species.

Report to 2 decimal places.

8.1.3.4 Less Decay

$$\text{Less Decay} = \sum_{t=1}^{n_p} S_t\,(1 - d_t)\,V_t$$

Where:

V_t = Gross merchantable volume of tree t.

d_t = Decay percent from Loss Factor Table.

Report to 2 decimal places.

8.1.3.5 Less Decay and Waste

$$\text{Less Decay/Waste} = \sum_{t=1}^{n_p} S_t\,(1 - d_t - w_t)\,V_t$$

Where

S_t = Number of trees per hectare that tree t represents.

V_t = Gross merchantable volume of tree t.

d_t = Decay percent from Loss factor table.

w_t = Waste percent from Loss factor table.

n_p = Number of trees in plot P.

Report to 2 decimal places.

8.1.3.6 Less Decay, Waste and Breakage - Net Merchantable Volume per Hectare

$$\text{Less DWB} = \sum_{t=1}^{n_p} S_t \ (1 - d_t - w_t - b_t)\ V_t$$

Where:

S_t = Number of trees per hectare that tree t represents.

V_t = Gross merchantable volume of tree t.

d_t = Decay percent from Loss factor table.

w_t = Waste percent from Loss factor table.

b_t = Breakage percent from Loss factor table.

n_p = Number of trees in plot P.

Report to 2 decimal places.

8.1.3.7 Loss Factor Table

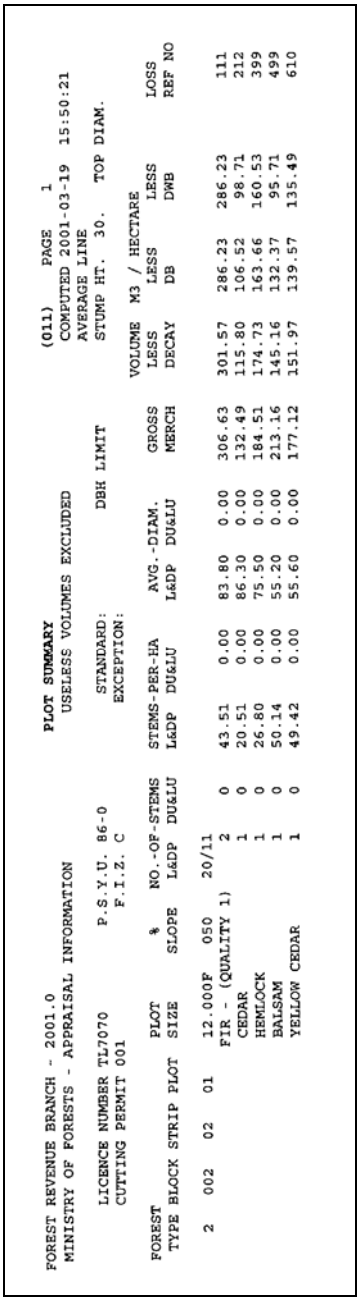
Refer to Section 3.3.1 Step #3 for instructions on determining the appropriate loss factor table.

8.1.4 Plot Frequency Report

At the end of the Plot summary report, list the number of measure plots and hectares per plot for each Type within Block and Type within cutting permit.

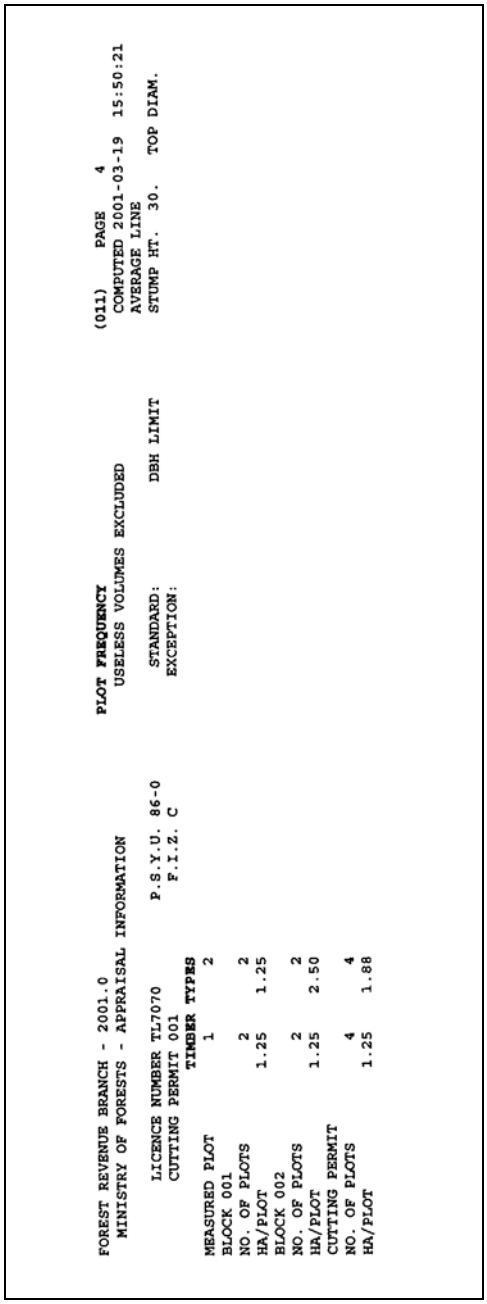
8.2 Plot Summary Listing

Report 011 - required.



```
FOREST REVENUE BRANCH - 2001.0                    PLOT SUMMARY                                    (011)     PAGE    1
 MINISTRY OF FORESTS - APPRAISAL INFORMATION          USELESS VOLUMES EXCLUDED                      COMPUTED 2001-03-19  15:50:21
                                                                                                    AVERAGE LINE
     LICENCE NUMBER TL7070          P.S.Y.U. 86-0          STANDARD:          DBH LIMIT             STUMP HT.  30.   TOP DIAM.
     CUTTING PERMIT 001               F.I.Z. C             EXCEPTION:                                VOLUME  M3 / HECTARE
                                                                                                    LESS    LESS     LESS      LOSS
 FOREST                                                                                             DECAY   DB       DWB       REF NO
   TYPE BLOCK STRIP PLOT  SIZE    SLOPE   L&DP  DU&LU   L&DP  DU&LU   L&DP  DU&LU   MERCH
     2  002   02   01   12.000F  050  20/11
                        FIR - (QUALITY 1)    2     0    43.51  0.00   83.80  0.00   306.63   301.57  286.23   286.23      111
                        CEDAR                1     0    20.51  0.00   86.30  0.00   132.49   115.80  106.52    98.71      212
                        HEMLOCK              1     0    26.80  0.00   75.50  0.00   184.51   174.73  163.66   160.53      399
                        BALSAM               1     0    50.14  0.00   55.20  0.00   213.16   145.16  132.37    95.71      499
                        YELLOW CEDAR         1     0    49.42  0.00   55.60  0.00   177.12   151.97  139.57   135.49      610
```

Figure 8.1 Plot Summary - Sample Listing.



```
FOREST REVENUE BRANCH - 2001.0                    PLOT FREQUENCY                    (011)    PAGE    4
  MINISTRY OF FORESTS - APPRAISAL INFORMATION       USELESS VOLUMES EXCLUDED          COMPUTED 2001-03-19  15:50:21
                                                                                      AVERAGE LINE
      LICENCE NUMBER TL7070          P.S.Y.U. 86-0      STANDARD:        DBH LIMIT   STUMP HT.  30.   TOP DIAM.
      CUTTING PERMIT 001               P.I.Z. C         EXCEPTION:
                    TIMBER TYPES
MEASURED PLOT          1      2
BLOCK 001
NO. OF PLOTS           2      2
HA/PLOT             1.25   1.25
BLOCK 002
NO. OF PLOTS           2      2
HA/PLOT             1.25   2.50
CUTTING PERMIT
NO. OF PLOTS           4      4
HA/PLOT             1.25   1.88
```

Figure 8.2 Plot Frequency - Sample Listing.

8.3 Plot Summary by Maturity Overview and Listing

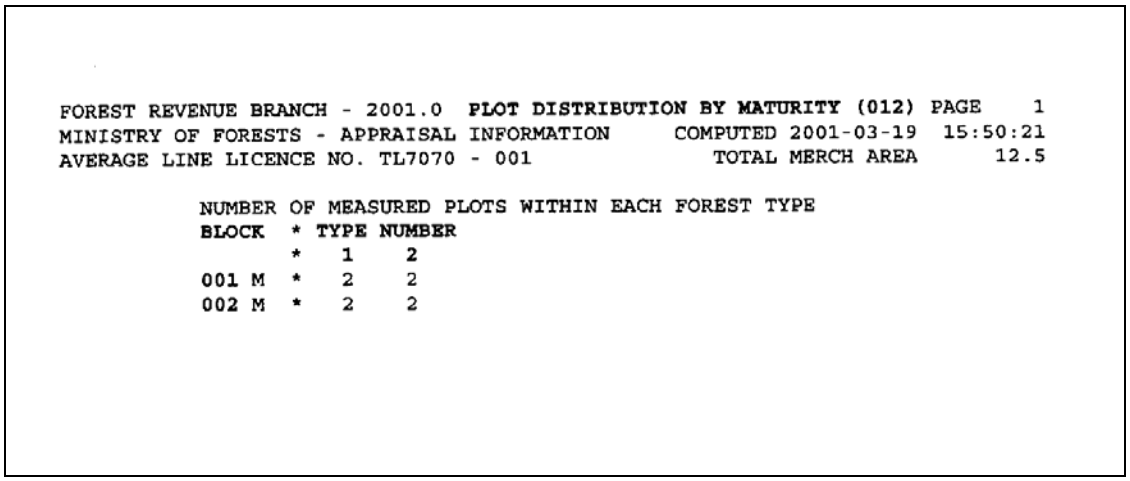
For each Block/Timber Type combination, report the number of count and measure plots, by Maturity. Use the Block maturity indicator from card type D to determine whether the block is mature or immature.

This report is only for Coast compilations and is optional.

8.3.1 Header Information

1. License from card type A.
2. Cutting Permit from card type A.
3. Total Merchantable area from card type A.
4. Message indicating whether compilation is for appraisals or not.
5. Method of calculation (Average Line or Block).
6. Special compilation messages for:
    a. Double Sampling.
    b. Stump cruise compilation.
7. Compiler program name and version.
8. Compile date and time.
9. Page number.

8.3.2 Sample Listing



```
FOREST REVENUE BRANCH - 2001.0  PLOT DISTRIBUTION BY MATURITY (012) PAGE    1
MINISTRY OF FORESTS - APPRAISAL INFORMATION     COMPUTED 2001-03-19  15:50:21
AVERAGE LINE LICENCE NO. TL7070 - 001              TOTAL MERCH AREA      12.5

          NUMBER OF MEASURED PLOTS WITHIN EACH FOREST TYPE
          BLOCK  * TYPE NUMBER
                 *   1    2
          001 M  *   2    2
          002 M  *   2    2
```

Figure 8.3 Plot Distribution by Maturity - Sample Listing.

8.4 Cruise Statistics Overview

The Cruise Statistics summary reports volume and basal area statistics for each Timber Type in the compilation and for the entire Cutting Permit.

8.4.1 Header information

1. License from card type A.
2. Cutting Permit from card type A.
3. Forest Inventory Zone from card type A.
4. Unit # and Block from card type A.
5. Forest Region and District from card type A.
6. Merchantability requirements levels and exceptions from card type B.
7. Message indicating whether compilation is for appraisals or not.
8. Method of calculation (Average Line or Block)
9. Special compilation messages for:
    a. Reduction compilation.
    b. Stump cruise compilation.
    c. Tree class combination - useless volumes are included or excluded determined by column 15 of card type B (0 or blank - snags excluded, 1 - snags included).
    d. Selective cut indicator - which trees to compile depends on column 12 of card type B (blank - include all trees, 'C' - include cut-indicated and non-indicated trees, 'L' - include leave-indicated trees).
    e. Wet/Dry belt indicator - sale is in the wet belt or dry belt, depending on column 14 of card type B (0 - no message, 1 - wet belt, 2 - dry belt).
10. Compiler program name and version.
11. Compile date and time.
12. Page number.

8.4.2 Timber Type Information

For each Timber Type report.

8.4.2.1 Type Information

Report the Type number, Species composition, Age class, Height class, and Stocking Class from card type C.

8.4.2.2 Type of Plots

Either 'Fixed' or 'Prism' depending on the type of plots being compiled. If both fixed area and prism plots are used then report 'Mixed'.

8.4.2.3 Number of Potential Trees

Report the number of stems listed in plots from the Timber Type. If a percent reduction is being compiled, report the pre-reduction amount. If border plots are in the type, double the number of stems from those plots.

Report to the nearest whole number.

8.4.2.4 Number of Measured and Count Plots

Report the number of measured plots and count plots in the Timber Type.

8.4.2.5 Mean Net Volume per Hectare

Take the average of the estimates from the plots within the Timber Type.

$$\overline{V_i} = \frac{\sum_{p=1}^{m} V_p}{m}$$

Where

$\overline{V_i}$ = Timber Type i volume/hectare.

V_p = Volume/hectare estimate from plot p (refer to Section 3.4.2.3).

m = Number of measure plots in the Timber Type i.

Report to 1 decimal place.

Example 8.2

The subscripts in the above summation refer to the plots within the Type. 'P=1' means 'starting with the first plot in the Type' and 'm' means 'ending with the last plot in the Type'. In this example, there are 3 measure plots in Type 1. There are no count plots and no reductions being compiled. The average volume per hectare for the Type is:

$\overline{V_1}$ = (1048.47 + 828.07 + 726.08) / 3 = 867.54 m^3 per hectare

8.4.2.6 Mean Net Basal Area/hectare

For the basal area per hectare, include count plots in the summation instead of accommodating for count plots with the double sampling ratio.

$$\overline{b_i} = \frac{\sum_{p=1}^{m+c} BA_p}{m+c}$$

Where:

$\overline{b_i}$ = Timber Type basal area/hectare, corrected for double sampling.

BA_p = Basal area/hectare estimate from plot p (see Section 3.4.1.2 or 3.4.2.2).

m = Number of measure plots in the Timber Type.

c = Number of count plots in the Timber Type.

Report to 1 decimal place.

8.4.2.7 Standard Deviation for Volume - Measure Plots Only

$$SD_{vm} = \sqrt{\frac{\sum_{p=1}^{m} V_p^2 - \left(\sum_{p=1}^{m} V_p\right)^2 \Big/ m}{m-1}}$$

Where:

SD_{vm} = Standard Deviation for volume from measure plots only.

V_p = Volume/hectare estimate from measure plot p, not corrected for double sampling (i.e., do not apply DSR, see Section 3.4.1.3 or 3.4.2.3).

m = Number of measure plots in the Timber Type.

Report to 4 decimal places.

Example 8.3

Using the same plots as were used in Example 8.2:

$$\sum_{p=1}^{m} V_p^2 = 1048.47^2 + 828.07^2 + 726.08^2 = 2312181.432$$

$$\left(\sum_{p=1}^{m} V\,p \right)^2 = (1048.47 + 828.07 + 726.08)^2 = 6773630.864$$

$$SD_{vm} = \sqrt{\frac{2312181.432 - 6773630.864/3}{3-1}} = 164.7794$$

8.4.2.8 Standard Deviation for Basal Area - All Plots

Calculate the basal area standard deviation the same as the volume standard deviation, but include the count plots.

$$SD_b = \sqrt{\frac{\sum_{p=1}^{m+c} BA_p^2 - \left(\sum_{p=1}^{m+c} BA_p \right)^2 \Big/ m+c}{m+c-1}}$$

Where:

SD_b = Standard Deviation for basal area from measure and count plots.

BA_p = Basal area/hectare estimate from plot p (see Section 3.4.1.2 or 3.4.2.2).

m = Number of measure plots in the Timber Type.

c = Number of count plots in the Timber Type.

Report to 4 decimal places.

8.4.2.9 Coefficient of Variation for Volume - Measure Plots Only

The coefficient of variation is the standard deviation divided by the mean, expressed as a percent.

$$CV_v = \frac{SD_{vm}}{\overline{V_m}} * 100$$

Where

SD_{vm} = Standard Deviation for volume from measure plots only (defined above e).

$\overline{V_m}$ = The average volume per hectare from measure plots in the Timber Type, not corrected for double sampling (i.e., do not apply DSR, see Section 3.4.1.3 or 3.4.2.3)

$$= \frac{\sum_{p=1}^{m} V_p}{m}$$

Report to 1 decimal place.

Example 8.4

Using the volume per hectare and standard deviation from Examples 8.2 and 8.3, the coefficient of variation is calculated as:

CV_v = (164.7794 / 867.54) * 100 = 19.0

8.4.2.10 Coefficient of Variation for Basal Area

Calculate the basal area coefficient of variation the same as the volume coefficient of variation.

$$CV_b = \frac{SD_b}{\overline{b}} * 100\%$$

Where

SD_b = Standard Deviation for basal area from measure and count plots (defined above).

$\bar{b}$ The average basal area/hectare from measure and count plots in the Type (defined above).

Report to 1 decimal place.

8.4.2.11 Standard Error of the Mean Percent for Volume

$$SEM_v\% = \frac{SEM_v}{\overline{V}} * 100$$

Where:

$SEM_v\%$ = Standard error of the mean for volume expressed as a percent of the average volume.

SEM_v = $\sqrt{S_v^2} * FPC$

$$S_v^2 = \left[SD_{vm}^2 - 2\left(\frac{\overline{V}_m}{\overline{b}_m}\right) S_{vb} + \left(\frac{\overline{V}_m}{\overline{b}_m}\right)^2 SD_{bm}^2 \right]\left(\frac{1}{m} - \frac{1}{c+m}\right) + \frac{SD_{vm}^2}{c+m}$$

S_{vb} = Covariance between volume and basal area for measured plots only.

$$S_{vb} = \frac{\sum_{p=1}^{m} V_p BA_p - \left(\sum_{p=1}^{m} BA_p\right)\left(\sum_{p=1}^{m} V_p\right) \Big/ m}{m-1}$$

SD^2_{bm} = Variance of basal area a for measure plots only.

$$SD^2_{bm} = \frac{\sum_{p=1}^{m} BA_p^2 - \left(\sum_{p=1}^{m} BA_p\right)^2 \Big/ m}{m-1}$$

SD_{vm} = Standard deviation for volume from measured plots only (see Section 8.4.2.9).

$\overline{b_m}$ = $\frac{\sum_{i=1}^{m} BA_i}{m}$ = type average basal area/hectare from measure plots only.

$\overline{V_m}$ = Average volume/hectare from measured plots only (see Section 8.4.2.9).

FPC = 1.0 for Types sampled using variable plots, or

= $\sqrt{\frac{N-m}{N-1}}$ for Types sampled using fixed area plots.

N = Total number of possible plots in the type if 100% cruised.

m = Number of measure plots in the Timber Type.

c = Number of count plots in the Timber Type.

Report to 1 decimal place.

Example 8.5

Using the Type from Examples 8.2 and 8.3, assume that there are 3 count plots. The basal area per hectare estimates from the 3 measure plots are; 120, 80 and 90 respectively. The revised mean volume per hectare based on double sampling is 733.4.

S_{vb} = $\frac{257409.2 - 290 * 2602.62/3}{3-1}$ = 2911.3

SD^2_{bm} = $\frac{28900 - 84100/3}{3-1}$ = 433.33

S^2_v = $\left[27152.251 - 2\left(\frac{867.54}{96.67}\right)2911.3 + \left(\frac{867.54}{96.67}\right)^2 433.33\right]\left(\frac{1}{3} - \frac{1}{3+3}\right) + \frac{27152.251}{3+3}$

= [27152.25 – 52255.23 + 34901.78](1/6) + 4525.38 = 6158.51

FPC = 1.0

SEMv = $\sqrt{6158.51} * 1.0$ = 78.48

$SEM_v\%$ = 100 * (78.48 / 733.4) = 10.7

8.4.2.12 Standard Error of the Mean Percent for Basal Area

$$SEM_b\% = \frac{SEM_b}{\overline{b_i}} * 100\%$$

Where

$SEM_b\%$ = Standard error of the mean for volume expressed as a percent of the average basal area.

SEM_b = $\sqrt{\frac{SD_b^2}{m+c}} * FPC$

S_b^2 = Variance of Basal Area for all plots

= $\frac{\sum_{i=1}^{m+c} BA_p^2 - \left(\sum_{i=1}^{m+c} BA_p\right)^2 / (m+c)}{m+c-1}$

FPC = Finite population correction

= 1.0 when sampling using variable plots

= $\sqrt{\frac{N-n}{N-1}}$ when sampling using fixed area plots

N = Total number of possible plots in the type if 100% cruised.

n = Actual number of plots sampled

m = Number of measure plots in the Timber Type.

c = Number of count plots in the Timber Type.

Report to 1 decimal place.

8.4.2.13 % Confidence Interval for Volume

$$95\%\ CI_v = \overline{V}_m \pm SEM_v\ \% * t_{m-1}$$

Where:

t_{m-1} = t-value from Appendix 11 with m-1 degrees of freedom.

Report to 1 decimal place.

Example 8.6

Using the standard error of the mean for volume from Example 8.5, and the t-value from appendix 11 for 3-1=2 degrees of freedom, half of the 95 percent confidence interval for Type 1 is:

Half of the $95\%CI_v = 10.7 * 4.303 = 46.0$

8.4.2.14 % Confidence Interval for Basal Area

$$95\%CI_b = \overline{b_i} \pm SEM_b * t_{m+C-1}$$

Where

t_{m+c-1} = t-value from Appendix 11 with m+c-1 degrees of freedom.

Report to 1 decimal place.

8.4.3 Cutting Permit Information

8.4.3.1 Cutting Permit 95% Confidence Interval for Volume - All Plots

$$95\%CI_{vcp} = \pm 100 * \frac{\sqrt{\sum_{i=1}^{k} r_i^2 SEM_{vi}^2}}{\overline{V_{cp}}} * t_{(m+c)-k}$$

Where:

SEM_{vi} = SEM_v for Type i.

r_i = Proportional area of Type i.

$$r_i = \frac{A_i}{\sum_{i=1}^{k} A_k}$$

k = Number of Types.

m = Number of measure plots in the Cutting Permit.

C = Number of count plots in the Cutting Permit.

$t_{(m+c)-k}$ = t value from Appendix 11 with (m+c) - k degrees of freedom.

$\overline{V_{cp}}$ = Average volume/hectare for the Cutting Permit.

$$= \frac{\sum_{i=1}^{k} A_i \overline{V}_i}{\sum_{i=1}^{k} A_i}$$

Report to 1 decimal place.

Example 8.7

Say the Standard Error of the Mean is 78.5 for Type 1 and 45.0 for Type 2. Type 1 has 5 ha and Type 2 has 7.5 ha. The revised mean is 733.4 for Type 1 and 632.3 for Type 2. There are 3 measure plots in each Type.

$$95\%CI_{vcp} = \pm 100 * \frac{\sqrt{0.16 \text{ x } 6162.25 + 0.36 \text{ x } 2025}}{5 \text{ x } 733.4 + 7.5 * 632.3 / 12.5} \text{ x } 2.776 = \pm 17.1$$

8.4.3.2 Cutting Permit 95% Confidence Interval for Basal Area - All Plots

$$95\%CI_{cpb} = \pm 100 * \frac{\sqrt{\sum_{i=1}^{k} r_i^2 SEM_{bi}^2}}{\overline{b_{cp}}} * t_{(m+c) - k}$$

Where:

SEM_{bi} = Average volume/hectare for the Cutting Permit.

= SEM_b for Type i.

r_i = Proportional area of Type i.

$$r_i = \frac{A_i}{\sum_{i=1}^{k} A_k}$$

$\overline{b_{cp}}$ = Average basal area/hectare for the Cutting Permit.

$$= \frac{\sum_{i=1}^{k} A_i \overline{b_i}}{\sum_{i-1}^{k} A_i}$$

Report to 1 decimal place.

8.4.3.3 Cutting Permit 95% Confidence Interval for Volume - Measure Plots Only

$$95\%CI_{vmcp} = \pm 100 * \frac{\sqrt{\sum_{i=1}^{k} r_i^2 SEM_{vmi}^2}}{\overline{V_{cpm}}} * t_{m-k}$$

Where:

SEM_{vmi} = SEM_{vm} for Type i - measure plots only.

$$SEM_{vm} = \sqrt{\frac{SD_{vm}^2}{m}}$$

r_i = Proportional area of Type i.

$$r_i = \frac{A_i}{\sum_{i=1}^{k} A_k}$$

$\overline{V_{mcp}}$ = Average volume/hectare for the Cutting Permit - measure plots only.

$$= \frac{\sum_{i=1}^{m} A_i \overline{V_i}}{\sum_{i=1}^{k} A_i}$$

k = Number of timber types.

m = Number of measure plots in the cutting permit.

Report to 1 decimal place.

8.4.3.4 Cutting Permit 95% Confidence Interval for Basal Area - Measure Plots Only

$$95\%CI_{bcp} = \pm 100 * \frac{\sqrt{\sum_{i=1}^{k} r_i^2 SEM_{bmi}^2}}{\overline{b_{cpm}}} * t_{m-k}$$

Where:

SEM_{bmi} = SEM_{bm} for Type i, measured plots only.

SEM_{bm} = $\sqrt{\frac{SD_{bm}^2}{m}}$

r_i = $\frac{A_i}{\sum_{i=1}^{k} A_k}$

k = Number of timber types.

m = Number of measure plots in the cutting permit.

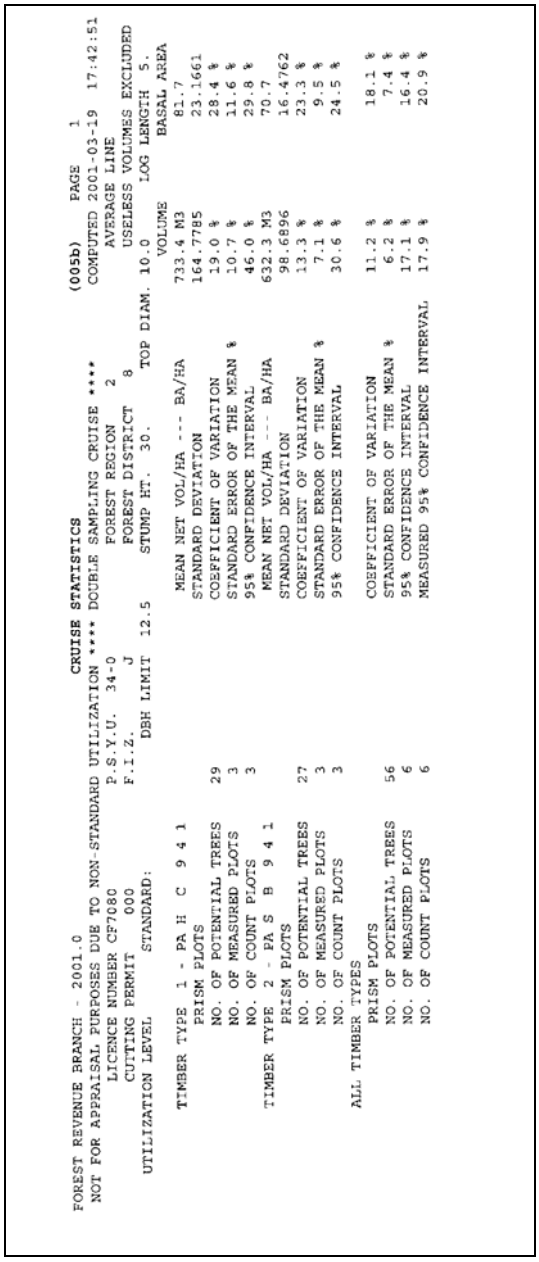
$\overline{b_{cpm}}$ = Average basal area/hectare for the Cutting Permit, measure plots only.

= $\frac{\sum_{i=1}^{k} A_i \bar{b}_i}{\sum_{i=1}^{k} A_i}$

Report to 1 decimal place.

8.5 Cruise Statistics Listing

Report 005b - required.



```
                                                                                (005b)     PAGE    1
                                    CRUISE STATISTICS                     COMPUTED 2001-03-19  17:42:51
FOREST REVENUE BRANCH - 2001.0
 NOT FOR APPRAISAL PURPOSES DUE TO NON-STANDARD UTILIZATION **** DOUBLE SAMPLING CRUISE ****       AVERAGE LINE
        LICENCE NUMBER CF7080          P.S.Y.U.  34-0          FOREST REGION     2                USELESS VOLUMES EXCLUDED
          CUTTING PERMIT    000       F.I.Z.      J           FOREST DISTRICT   8
    UTILIZATION LEVEL      STANDARD:      DBH LIMIT  12.5     STUMP HT.  30.     TOP DIAM. 10.0     LOG LENGTH  5.
                                                                                                  VOLUME      BASAL AREA
        TIMBER TYPE  1 - PA H  C  9 4 1                        MEAN NET VOL/HA --- BA/HA          733.4 M3       81.7
              PRISM PLOTS                                      STANDARD DEVIATION                164.7785       23.1661
                 NO. OF POTENTIAL TREES      29                COEFFICIENT OF VARIATION           19.0 %         28.4 %
                 NO. OF MEASURED PLOTS        3                STANDARD ERROR OF THE MEAN %       10.7 %         11.6 %
                 NO. OF COUNT PLOTS           3                95% CONFIDENCE INTERVAL            46.0 %         29.8 %
        TIMBER TYPE  2 - PA S  B  9 4 1                        MEAN NET VOL/HA --- BA/HA          632.3 M3       70.7
              PRISM PLOTS                                      STANDARD DEVIATION                 98.6896        16.4762
                 NO. OF POTENTIAL TREES      27                COEFFICIENT OF VARIATION           13.3 %         23.3 %
                 NO. OF MEASURED PLOTS        3                STANDARD ERROR OF THE MEAN %        7.1 %          9.5 %
                 NO. OF COUNT PLOTS           3                95% CONFIDENCE INTERVAL            30.6 %         24.5 %
        ALL TIMBER TYPES
              PRISM PLOTS                                      COEFFICIENT OF VARIATION           11.2 %         18.1 %
                 NO. OF POTENTIAL TREES      56                STANDARD ERROR OF THE MEAN %        6.2 %          7.4 %
                 NO. OF MEASURED PLOTS        6                95% CONFIDENCE INTERVAL            17.1 %         16.4 %
                 NO. OF COUNT PLOTS           6                MEASURED 95% CONFIDENCE INTERVAL   17.9 %         20.9 %
```

Figure 8.4 Cruise Statistics - Sample Listing.