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November 25, 2025

BY EMAIL

To: Regional Executive Directors

From: Allan Bennett, Director, Timber Pricing Branch

Re: Amendment No. 5 to the *Cruising Manual*

I hereby approve Amendment No. 5 to the *Cruising Manual*.

The manual can be found here:
[Timber Cruising Manual](#)

The purpose of this amendment is to update the *Cruising Manual*, which provides:

- 3P sampling pilot project for the Sunshine Coast District in the Coast Area.

Amendment No. 5 of the *Cruising Manual* comes into effect on December 1, 2025.



Allan W. Bennett, RPF
Director
Timber Pricing Branch

pc: Jillian Rousselle, Assistant Deputy Minister, Timber, Economics and Planning
Randy Husband, Director, Regional Operations Division, Coast Area
Anthony Giannotti, Director, Regional Operations Division, North Area
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Fred von Westharp, Pricing Section Head, Regional Operations Division, Coast Area
Gretchen Prystawik, Revenue Team Lead, Regional Operations Division, North Area
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TIMBER PRICING BRANCH

Cruising Manual

Effective: July 1, 2020

Includes Amendments

Amendment No. 5

Amendment No. 4

Amendment No. 3

Amendment No. 2

Amendment No. 1

Effective Date

December 1, 2025

August 1, 2025

February 1, 2025

August 1, 2024

July 1, 2021



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Highlights

Section	Description
1.1	Added definition for 3P Sampling.
2.3.1	Addition of 3P sampling for single stem scale based cutting authorities.
2.3.2	Added procedures for waiving sampling error for Interior linear area based tenures.
2.6.4	Addition of 3P sampling.
Appendix 22	Addition of 3P Sampling Pilot Project Procedures.

1.1. Definitions

In this manual:

“**100% Cruise**” means a cruise in which every tree is measured;

“**3P Sampling**” means Probability Proportional to Prediction and is a timber cruising method in which a cruiser predicts the volume of each tree to be harvested and only measure those selected after prediction. The compiled measured tree results are compared with their predicted volumes to generate a ratio adjustment, which is applied to all predicted volumes to estimate the attributes of the total population;

“**Absolute Variation**” means the difference between two measurements or a standard and a measurement, disregarding the plus or minus sign (e.g., standard of 7 and measurement of 5 gives absolute variation of 2);

“**Accuracy**” means the nearness of a measurement to the actual value of the variable being measured;

“**Area Director**” means the Area Director of Pricing and Tenures for the North or South Areas, the Area Director of Pricing, Tenures and Administration for the Coast Area, and/or their delegates;

“**BAF (Basal Area Factor)**” means the basal area (m^2) per hectare that each "in" tree represents when using a prism or relaskop. Prisms are sometimes classified as "diopeter" size or inscribed with the BAF number. The size denotes the basal area factor (i.e., an 8 BAF prism which tallies 7 trees in a plot would give a basal area (in timber) of $56 m^2/hectare$);

“**BC Albers**” means a map projection that is one of the standard map projections used in British Columbia.

“**BCTS**” means BC Timber Sales;

“**Bias**” means a difference between the sampling result and the actual value due to errors in measurement, sampling procedure or calculations;

“**Bole**” means the trunk or main stem of the tree and excludes branches and candelabras. The bole of the tree includes merchantable and non-merchantable portions of the trunk of the tree.

“**Boring Height**” means the distance from the ground (high side) up the tree to where an age is taken with an increment borer. It is usually taken at breast height (1.3 m);

“**Breast Height**” means the location on a tree where its diameter (DBH) is measured. It is located exactly 1.3m above "high side". If high side is lower than the point of germination (POG), breast height is 1.3 m above the POG;

“**Cardinal directions**” means North, South, East and West. All references to azimuths or bearings mean the “true” value. For a description of True North, please see True North, Magnetic North and Grid North in the Appendices;

2.3.1. Scale Based Cutting Authorities

1. Unless otherwise stated, the scale-based cutting authority sampling error objective is $\leq 15.0\%$ at 2 SE based on the total stand net merchantable volume prior to any percent reductions.
2. Single Stem – the options are:
 - a. 100% cruise of the cut trees,
 - b. Achieve $\leq 15.0\%$ sampling error on the cut trees at 2 SE using variable radius plots,
 - c. Sample using at least 2 variable radius measure plots/ha and at least 2.0 cut trees/plot,
or
 - d. 3P sampling as per procedures in Appendix 22.

The sampling error requirement will be waived if the following three conditions have been met:

1. A systematic square grid of equal intervals and spacing of 100 metre by 100 metre, or less, has been established in each timber type.
2. For cutting authorities:
 - a. of 20.0 ha net merchantable area or larger in size, a maximum ratio of 1.0 count plot to 1.0 full measure plot has not been exceeded, or
 - b. of less than 20.0 ha net merchantable area in size, only full measure plots are used. (Count plots are acceptable in addition to the required intensity of full measure plots. E.g. A 70 metre by 70 metre grid with alternating full measure and count plots is acceptable.) And
3. An average of at least 4.0 trees per plot per cutblock has been met. If the minimum tree count cannot be achieved with a BAF 2 prism, then the minimum tree count requirement will be waived.

2.3.2. Area Based Cutting Authorities – Interior

For area based cutting authorities that meet the requirements under Section 6.7.1 or 6.7.2 of the *Interior Appraisal Manual*, the cruise volume is determined as directed in the IAM.

For area based cutting authorities that require a timber cruise as per the IAM, the following requirements must be met:

1. Achieve a sampling error of $\leq 15.0\%$ at 2 SE. This requirement is waived if the cutting authority is cruised with a 100m square grid **for non-linear tenures, or an average of one plot per hectare for linear tenures**, and a maximum count plot to measure plot ratio of 1:1, and
2. An average of at least 4.0 trees per plot must be met. This requirement is waived if the timber types with less than 4.0 trees per plot are cruised with BAF 6 prism.

Plot establishment for area based cutting authorities must follow these procedures:

1. Linear tenures must allocate the plots with equal plot spacing along the centerline of the proposed harvest area.
 - a. The first plot must be located half the inter plot distance from the start of the linear tenure harvest area.
2. Non linear tenures must use a cruise design as per Section 2.4.1 of this manual.
3. All timber types must have a minimum of 2 measure plots.

2.3.3. Cruise Based Cutting Authorities – Interior

The following minimum sampling error objectives apply to all BC Timber Sales cruise based cutting authorities within the Interior as described in the *Interior Appraisal Manual*:

BC Timber Sales cutting authorities must:

1. Achieve a $\leq 10.0\%$ sampling error objective at 2 SE using measure and count plots, and an average of at least 4.0 trees per plot per cutblock, or
2. The sampling error will be waived if the following conditions have been met:
 - a. A systematic grid of equal intervals and spacing of not greater than 70 metres by 70 metres has been established,
 - b. A maximum ratio of 1.0 count plot to 1.0 measure plot has not been exceeded, and
 - c. An average of at least 4.0 trees per plot per cutblock has been achieved.

The following minimum sampling error objectives apply to all other cruise based cutting authorities within the Interior as described in the *Interior Appraisal Manual*:

1. $\leq 8.0\%$ at 2 SE on all plots, and
2. If count plots are used, a 2 SE of $\leq 12.0\%$ on full measure plots must be achieved.

All other scale based standards apply, except that the sampling error cannot be waived.

Interior cutting authorities cannot be cruise based if a partial cutting prescription with greater than 10% percent overall volume or basal area retention is in place.

2.3.4. Cruise Based Cutting Authorities – Coast

The following minimum sampling error objectives apply to all cruise based cutting authorities within the Coast area (except road right of way timber to be transported under road timbermark) as described in the Coast Appraisal Manual:

Cutting authorities must:

1. achieve a $\leq 10.0\%$ sampling error objective at 2 SE using measure and count plots, and an average of at least 4.0 trees per plot per cutblock, or
2. The sampling error will be waived if the following conditions have been met:

2.6. Types of Cruises

2.6.1. One Hundred Percent Cruise

A 100% cruise requires that all trees to be harvested are measured and recorded as per Section 4.3 and Section 5.2.12 of this manual. Each tree in a 100% cruise cutting authority must be physically numbered and marked as a cut tree.

2.6.2. Fixed Area Plot Sampling (See Section [4.3.1.13](#))

Fixed area plot sampling is a method of using sample plots with a fixed size (area) for selecting the trees to be tallied. The plots are normally circular or square. It is also known as sampling without replacement since trees are not included in more than one sample plot.

The fixed area plot size must be consistent by timber type and count plots are not permitted in fixed area plots. Border plots are permitted in fixed area plots.

For additional information on fixed area plots and calculating sample size, please see Appendix 1 on [Additional Sampling Information](#).

2.6.3. Variable-Plot Sampling (Prism or Relaskop) (See Section [4.3.1.15](#))

Variable plot sampling is a method of selecting trees to be tallied based on their size and not the frequency or density of the trees in the stand. The main advantage with using the variable plot instead of the fixed area method is that the probability of tree selection is proportional to the size (basal area at breast height) of the tree. Variable plots are more efficient to measure than fixed area plots because a plot perimeter is not required since every tree has its own plot radius and can be assessed for in/out status with an angle gauge (e.g., prism or relaskop).

For additional information on variable plot sampling, calculating sample size, and calculating coefficient of variation (CV) please see Appendix 1 on [Additional Sampling Information](#).

2.6.4. 3P Sampling

3P sampling requires that all trees to be harvested are cruised as per Appendix 22. Each tree in a 3P sampling cutting authority must be mapped, physically numbered and marked as a cut tree.

7.22. Appendix 22: 3P Sampling Pilot Project Procedures

Licensees must have prior approval from Director, Timber Pricing Branch before using 3P sampling as a cruising method. 3P sampling can only be used to cruise helicopter single stem scale based cutting authorities in the Sunshine Coast District until March 31, 2026.

After approval is granted, the following sampling, compiling and submission process must be adhered to:

- 1) In the field, the licensee must individually number, mark and gps the location of all trees to be harvested in the cutting authority. Additionally, while in the field, document the species and estimated tree volume in cubic metres for each tree in the cutting authority.
- 2) Email Timber Pricing Branch an excel spreadsheet containing the above tree information for all the trees in the cutting authority along with maps identifying each tree location.
- 3) From the spreadsheet identified in Part 3, Timber Pricing Branch will select the sample trees for cruising. Once the sample trees are selected, the trees in the cutting authority cannot change.
- 4) Licensee must complete the field cruise of all sample trees using both Loss Factor and CGNF cruising procedures.
- 5) Licensee must complete a Loss Factor and CGNF compilation of the sample tree data. Numbering of the trees in the cruise data and compilation must match the sample numbers provided by Timber Pricing Branch. The compilation must include all required reports in Section 5.10 and the Tree Report.
- 6) Licensee must submit all sample tree cruise data and the associated compilation to Timber Pricing Branch by March 31, 2026. The Sunshine Coast District may choose to conduct a field audit upon submission.
- 7) Timber Pricing Branch will determine the compilation methodology and compile the final cruise results for the cutting authority. The results will be sent to the licensee to complete the submission into ECAS.
- 8) Licensee must create a report similar to an Appraisal Summary Report from the compiled data and submit it with their ECAS submission along with any other required documentation.