# SCALE DATA STANDARDS

# 12

## 12.0    Scale Data Standards

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1.  The completeness, accuracy and security of scale data are the responsibility of all parties who collect, process, or submit scale data.

2.  All parties collecting, processing or submitting scale data must have an adequate system of internal controls, including scale data controls, processing conventions and administrative processes to ensure all scale data is complete, accurate and secure.

3.  The Forest Management Branch will conduct checks and audits to assess the accuracy and completeness of scale data and the adequacy of controls.

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To ensure that scale data is consistent and reliable for all users, it must be captured, compiled, and reported in accordance with set standards.  The Forest Management Branch sets these standards.

This chapter documents standards for:

- Compiling log and segregation volumes,

- Compiling weight scale data.

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The Forest Management Branch may set other standards regulating the submission, computation, control, and documentation of scale data.  All persons processing scale data must ensure they are conversant with these requirements and ensure their standards are current.

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Parties processing scale data are subject to periodic audit by the Forest Management Branch.  Licensees and any other parties processing scale data may be required to assess and report their compliance with control requirements.

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Where the Forest Management Branch considers controls to be deficient, it may deny parties from processing and submitting scale data.

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## 12.1    Ensuring Compliance with Standards

In addition to setting scale computation and documentation standards and controls, the Forest Management Branch is responsible for ensuring they are complied with.  This responsibility is met through two activities:

- Approving all applications to process scale data, and
- Assessing compliance with standards and controls.

### 12.1.1   Approving Applications to Process Scale Data

The following procedures are in place to approve scale data processing.

### 12.1.2   Piece Scale Computation

For approval to compile piece scale data, an application must be submitted to the Forest Management Branch.  This application must include copies of supporting documentation, including both final reports and raw data.  The application may also require submission of supporting software and source code.

Following the Forest Management Branch's approval, proposals to compile piece scale data for any specific scale site must be approved by the Forest Management Branch as part of the scale site authorization for that scale site.

### 12.1.3   Weight Scale Computation

All weight scale releases including the software to select samples and compile data must be submitted to the Forest Management Branch for approval.  The application must include all supporting documentation.

Following approval by the Forest Management Branch, proposals to use the program for specific sites must be approved by the Forest Management Branch as part of the scale site authorization for that site.

### 12.1.4   Handheld Data Processing

Proposals to capture, compile, or report scale data using handheld computers are subject to approval by the Forest Management Branch. For this approval, applications must include copies of the software and user guide; raw scale data, detailed log listings, and computed reports, which will be submitted to the Forest Management Branch for processing. Following approval by the Forest Management Branch, proposals to use the handheld and software at specific sites must be approved by the Forest Management Branch as part of the scale site authorization for that site.

### 12.1.5   New Releases and Upgrades to Scaling Hardware/Software

All new releases and upgrades to hardware and/or software are subject to review by the Forest Management Branch before they are to be used to process production data at any scale site.

## 12.2    Standard for Compiling Log and Segregation Volumes

**Calculation Standard**

| Steps to Compute Log Volumes | Units | Decimal | Maximum Value | Source | Example |
|---|---|---|---|---|---|
| 1.  Top Radius Squared | cm² | 0 | 99999 | | 51844 |
| =    Top Radius | cm | 0 | 999 | Tally | 72 |
| *    Top Radius | cm | 0 | 999 | Tally | 72 |
| 2.  Top Area | cm² | 0 | 99999 | | 16286 |
| =    3.141592 | | | | pi | |
| *    Top Radius Squared | cm² | 0 | 99999 | Step 1 | 5184 |
| 3.  Top Area | m² | 4 | 9.9999 | | 1.6286 |
| =    Top Area | cm² | 0 | 99999 | Step 2 | 16286 |
| /    10000 | | | | | |
| 4.  Butt Radius Squared | cm² | 0 | 99999 | | 6241 |
| =    Butt Radius | cm | 0 | 999 | Tally | 79 |
| *    Butt Radius | cm | 0 | 999 | Tally | 79 |
| 5.  Butt Area | cm² | 0 | 99999 | | 19607 |
| =    3.141592 | | | | pi | |
| *    Butt Radius Squared | cm² | 0 | 99999 | Step 4 | 6241 |
| 6.  Butt Area | m² | 4 | 9.9999 | | 1.9607 |
| =    Butt Area | cm² | 0 | 99999 | Step 5 | 19607 |
| /    10000 | | | | | |
| 7.  Total Area | m² | 0 | 9.9999 | | 3.5983 |
| =    Top Area | m² | 0 | 9.9999 | Step 3 | 1.6826 |
| +    Butt Area | m² | 0 | 9.9999 | Step 6 | 1.9607 |
| 8.  Average Area | m² | 0 | 9.9999 | | 1.7947 |
| =    Total Area | m² | 0 | 9.9999 | Step 7 | 3.5893 |
| /    2 | | | | | |
| 9.  Length | m | 1 | 99.9 | | 6.2 |
| =    Length | dm | 0 | 999 | Tally | 62 |
| /    10 | | | | | |
| 10. Log Volume | m³ | 3 | 999.999 | | 11.127 |
| =    Average Area | m² | 4 | 9.9999 | Step 8 | 1.7947 |
| *    Length | m | 1 | 99.9 | Step 9 | 6.2 |
| 11. Log Volume Sum | m³ | 3 | 99999.999 | | 11.127 |
| =    Sum of Log Volumes (all logs) | m³ | 3 | 999.999 | Step 10 | 11.127 |
| 12. Segregation Volume (Piece Scale) | m³ | 1 | 99999.9 | | 11.1 |
| | m³ | 3 | 99999.999 | Step 11 | 11.127 |
| =    Log Volume Sum | | | | | |
| 13. Segregation Volume (Weight Scale) | m³ | 2 | 99999.99 | | 11.13 |
| | m³ | 3 | 99999.999 | Step 11 | 11.127 |
| =    Log Volume Sum | | | | | |

## 12.3     Calculation Conventions

> Rule:   Use only single-operation calculations, except in compound additions and subtractions where all operands have the same number of decimal places.

### 12.3.1   Multiplication

Compute each product to a number of decimal places equal to the sum of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the product. For example, the calculation to compute the product, to two decimal places, of two numbers, one with no decimal places, and the other with three decimal places, would be done as follows:

e.g.          262

x      .234

=      61.308        =        61.31 rounded to two decimal places

### 12.3.2   Division

Compute each quotient to a number of decimal places equal to the number of decimal places specified for the quotient plus one, then round to the number of decimal places specified for the quotient. For example, the calculation to compute the quotient, to two decimal places, of two numbers, each with zero decimal places, would be done as follows:

$$62.616$$

e.g.     $234309\overline{)14671518}$     =        62.62 rounded to two decimal places

### 12.3.3   Addition

Compute each sum to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the sum. For example, the calculation to compute the sum, to two decimal places, of two numbers, each with four decimal places, would be done as follows:

E.g.          13.5837

+     11.6489

=     25.2326        =        25.23 rounded to two decimal places

## 12.3.4  Subtraction

Compute each difference to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the difference.  For example, the calculation to compute the difference, to two decimal places, of two numbers, one with five decimal places, and the other with three decimal places, would be done as follows:

> E.g.           12.69999
> -          9.375  
> =          3.32499        =        3.32 rounded to two decimal places

## 12.3.5  Rounding

Determine the rightmost digit to be retained (e.g., 12.3449).
Determine the leftmost digit to be dropped (e.g., 12.3449).
If the leftmost digit to be dropped is less than five, then the rightmost digit retained is unchanged (e.g., 12.3449 rounded to 2 decimal places is 12.34).
If the leftmost digit to be dropped is five or greater, then the rightmost digit retained is incremented by one (e.g., 12.3450 rounded to 2 decimal places if 12.35).

## 12.4    Standards for Weigh Scale Calculations

**Calculation Standard**

| Calculation Steps for Each Species | Units | Decimal | Maximum Value | Source | Example |
|---|---|---|---|---|---|
| 1.  Ratio<br>   =  Sample-Volume<br>   /   Sample-Weight | m³/kg<br>m³<br>kg | 8<br>2<br>0 | 9(01).9(08)<br>9(07).9(02)<br>9(09) | SSF<br>SSF | 0.00099119 |
| 2.  Monthly-Weight-X-Rate<br>   =  Monthly-Weight<br>   *  Species-Rate | kg$/m³<br>kg<br>$ | 0<br>0<br>2 | 9(12)<br>9(09)<br>9(03).9(02) | Return Mark | 128138<br>51255<br>2.50 |
| 3.  New-Accumulated-Weight<br>   =  Old-Accumulated-Weight<br>   +  Monthly-Weight | kg<br>kg<br>kg | 0<br>0<br>0 | 9(09)<br>9(09)<br>9(09) | CBF Return | 25422540<br>25371285<br>51255 |
| 4.  New-Accumulated-Weight-X-Rate<br>   =  Old-Accumulated-Weight-X-Rate<br>   +  Monthly-Weight-X-Rate | kg$m³<br>kg$m³<br>kg$m³ | 0<br>0<br>0 | 9(12)<br>9(12)<br>9(12) | CBF Step 2 | 3291564<br>3163426<br>128138 |
| 5.  New-Accumulated-Volume<br>   =  Ratio<br>   *  New-Accumulated-Weight | m³<br>m³/kg<br>kg | 1<br>8<br>0 | 9(07).9(01)<br>9(01).9(08)<br>9(09) | Step 1<br>Step 3 | 25198.6<br>0.00099119<br>25422540 |
| 6.  New-Accumulated-Value<br>   =  Ratio<br>   *  New-Accumulated-Weight-X-Rate | $<br>m³/kg<br>kg$m³ | 2<br>8<br>0 | 9(08).9(02)<br>9(01).9(08)<br>9(12) | Step 1<br>Step 4 | 3262.57<br>0.00099119<br>3291564 |
| 7.  Display-Ratio<br>   =  Ratio<br>   *  1000 | m³/tonne<br>m³/kg<br>kg/tonne | 5<br>8<br>0 | 9(01).9(05)<br>9(01).9(08) | Step 1 | 0.99119<br>0.00099119<br>1000 |

> Rule:   Use only single-operation calculations, except in compound additions and subtractions where all operands have the same number of decimal places.

### 12.4.1 Multiplication

Compute each product to a number of decimal places equal to the sum of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the product.

For example, the calculation to compute the product, to two decimal places, of two numbers, one with no decimal places, and the other with three decimal places, would be done as follows:

e.g.          2.62
-      .234
=    61.308      =      61.31 rounded to two decimal places

### 12.4.2 Division

Compute each quotient to a number of decimal places equal to the number of decimal places specified for the quotient plus one, then round to the number of decimal places specified for the quotient.

For example, the calculation to compute the quotient, to two decimal places, of two numbers, each with zero decimal places, would be done as follows:

e.g.    $234309\overline{)14671518}$   =      62.62 rounded to two decimal places

(over: 62.616)

### 12.4.3 Addition

Compute each sum to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the sum.

For example, the calculation to compute the sum, to two decimal places, of two numbers, each with four decimal places, would be done as follows:

e.g.          13.5837
+    11.6489
=    25.2326      =      25.23 rounded to two decimal places

### 12.4.4 Subtraction

Compute each difference to a number of decimal places equal to the larger of the number of decimal places specified for the two operands, then round to the number of decimal places specified for the difference.

For example, the calculation to compute the difference, to two decimal places, of two numbers, one with five decimal places, and the other with three decimal places, would be done as follows:

e.g.          12.69999
     -           9.375
     =           3.32499       =          3.32 rounded to two decimal places

## 12.4.5  Rounding

Determine the rightmost digit to be retained (e.g., 12.3449).
Determine the leftmost digit to be dropped (e.g., 12.3449).
If the leftmost digit to be dropped is less than five, then the rightmost digit retained is unchanged.  (e.g., 12.3449 rounded to two decimal places is 12.34).
If the leftmost digit to be dropped is five or greater, then the rightmost digit retained is incremental by one (e.g., 12.3450 rounded to two decimal places is 12.35).

## 12.5     Scale Data Controls

All parties collecting, processing or submitting scale data must ensure there is adequate level of internal control in place to ensure all scale data are complete, accurate and secure.

All systems used to process scale data are subject to periodic audit by the Forest Management Branch.  Where the Forest Management Branch considers internal controls to be deficient, it may disallow parties from processing scale data.