



# **CRUISE PROCESSING USER'S GUIDE**

Washington Office  
Forest Management Service Center  
Fort Collins, Colorado

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# Introduction

The *CruiseProcessing* program has undergone some enhancements and changes in the past four years. It still provides accurate volume calculations and necessary reports for a timber sale. This documentation provides the user with guidance in working with the program and producing the required reports. Some special symbols were used in this documentation to draw attention to important points or tips.



This symbol represents an idea, tip or hint to aid the user through a screen or process. These items are not necessary to successfully complete a given process but will make it faster or easier.



This symbol represents a note and offers additional clarification or definition. Not reading the note is not harmful.



This symbol represents a potential problem or serious issue.

## Who to call



Questions, comments, problems, or just want to talk? Here are two people who would like to hear from you:

Ken Cormier, Group Leader, Measurements Group  
Phone: 970-295-5779  
email: [kcormier@fs.fed.us](mailto:kcormier@fs.fed.us)

Barbara E. Menzel, Programmer/Analyst, Measurements Group  
Phone: 970-295-5775  
email: [bmenzel@fs.fed.us](mailto:bmenzel@fs.fed.us)

# GETTING STARTED

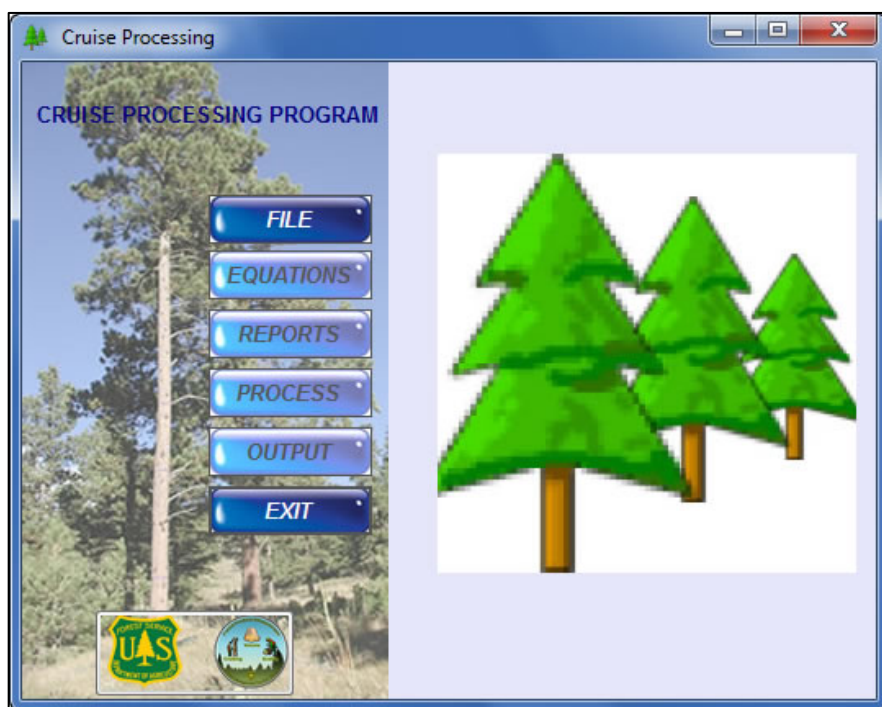
A formal installation program is available for *CruiseProcessing*. Simply download the file from the website and place on the desktop. Double click to start the installation process. No special permissions are required for this installation. Everything is installed in a folder called C:\ProgramFiles\FMSC. For users outside the Forest Service, the installation program allows the directory to be changed. Like other installation programs just follow the prompts and the program is effortlessly installed.



*NOTE: All window examples in this user's guide were generated in Windows 7.*

# MAIN WINDOW

The Main Window in *CruiseProcessing* consists of six buttons. Each button represents a task or function to be accomplished. The **About** button is in the lower left corner with the shields. When a main button is clicked, additional buttons are displayed on the right portion of the window. Initially, most of the buttons are disabled until a file is opened.



**FILE** – Allows the user to open existing files for processing.

**EQUATIONS** – Enter equations for volume or value as well as select the type of volume to calculate along with choosing to calculate biomass.

**REPORTS** – Select from nearly 150 basic and regional reports using pulldown lists.

**PROCESS** – Performs edit checks of the data, prepares data for processing, and calculates all requested volumes, values and/or weights/biomass.

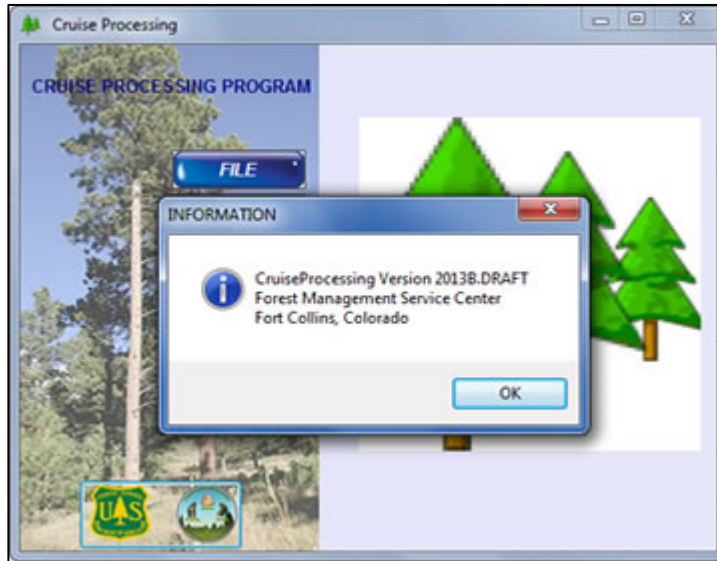
**OUTPUT** – Six additional buttons are displayed when the Output button is clicked. The text output file is created in this menu as well as optional HTML and PDF files. CSV files can also be created and Print Preview is accessed through this menu. Add Local Volume is also accessed in this menu.

**EXIT** – Closes the program.



Once a file has been opened for processing, the filename appears in the title bar of the window at the top. It may be shortened due to space limitations at the top but the main portion of the filename is displayed.

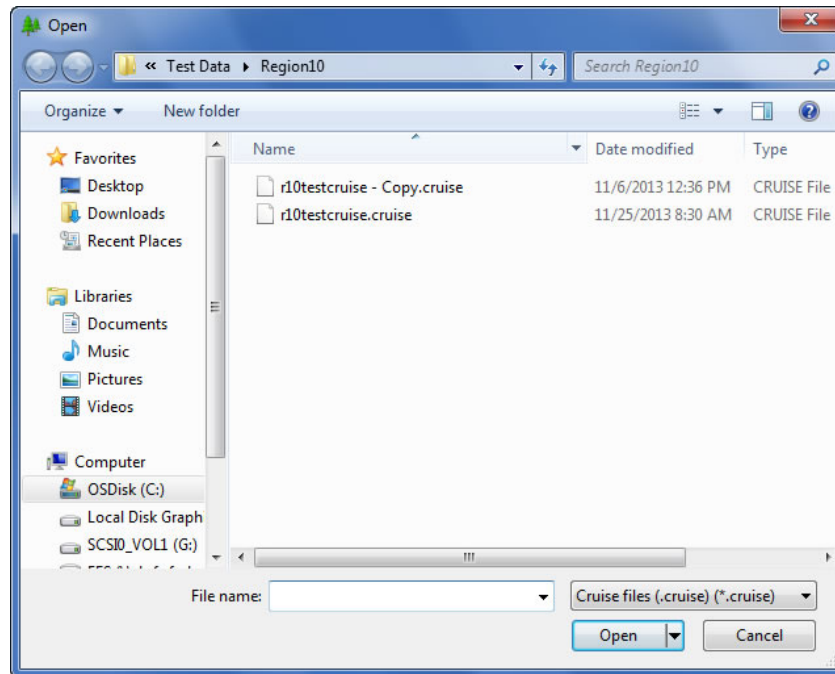
Clicking the **About** button in the lower left corner displays general information about the program.





# FILE SELECTION

When the **FILE** button on the **Main Menu** is clicked, the standard file **Open** window is displayed. All files in the current directory with an extension of **.cruise** are displayed. The user may navigate away from the current directory using the directory structure on the left. Alternatively, to open a file in the current directory, click on the filename and then click the **Open** button at lower right. (*NOTE: This example was run under Windows 7 so a Windows XP window would look slightly different.*)



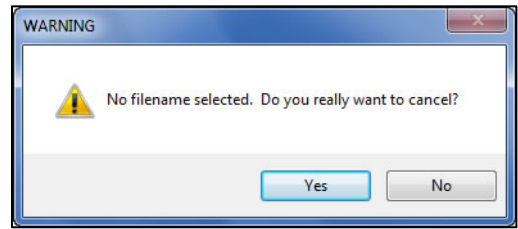
### Select An Existing File

An existing cruise object could come from one of two sources. It could have been created in *FScruiser/CruiseManager*. Alternatively, it could have been created as a production cruise in the *CruiseDesign* program. Either program can use a template file (**.cut**) to create the cruise file.

Any equation may already exist in a template file. If not, equations may need to be added to the file. See the **Equation Selection** section below for details on adding equations.

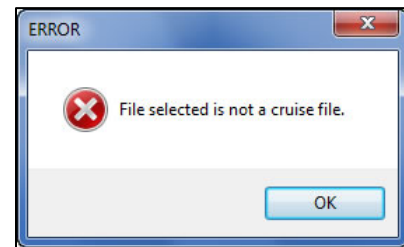
Additionally, reports may have been recorded in the template file. If not, reports need to be added or modified. See the section on **Reports** below for details on modifying the reports list.

Once the file is opened, the browse window closes automatically. The **Cancel** button is used to exit the window if opened by mistake or if no filename can be found. If Cancel is clicked before a filename is selected, no other button on the Main Menu is enabled. The warning message at right is displayed when the Cancel button is clicked.



### *Potential Errors*

This version of CruiseProcessing seems to have fewer errors when opening a file. In the future, potential errors could arise which would expand this section. However, as of this version, only the error shown at right could happen when trying to open a file.



Click the **OK** button to close the window and either **Exit** the program or try opening another file.

**Update** – Occasionally, an error is displayed indicating errors were found that must be corrected in *CruiseManager* or *FScruiser*. Close *CruiseProcessing* and open the file in either of those programs to determine and correct the error.

### *Editing a Template File (.CUT)*

Regional template files can now be edited in *CruiseProcessing*. Editing is restricted to volume equations and reports. All other functions are disabled.

With a few exceptions, volume equations can be edited or added for any region. Exceptions include Regions 8 and 9, Region 6 and BLM. For Region 6, template files for each individual forest may be edited.

When the browse window is opened, template files are not shown in the list in the lower right corner. Simply open the list and select **All files** to be displayed. Then select the template file to edit. Recall template files have an extension of **.CUT** instead of the regular cruise extension. Once the file is open, the Main Menu only shows Equations and Reports buttons as active. Edits and additions are done in the same manner as for a regular cruise file.



***It is important to make a backup copy of the template file to be edited. Alternatively, the user can save the updates with a different filename. If this is not done, the original template file will be overwritten. If this is not desired, MAKE A BACKUP OF THE ORIGINAL TEMPLATE FILE.***



# EQUATION SELECTION

When the **EQUATIONS** button is clicked, the following window is displayed. On the right side of the window, two buttons are now available. In general, this example shows buttons for entering volume equations and value equations. There are two additional buttons in the lower right corner. One allows modification of weight

factors and the second allows modification of merchandizing rules. More on these two buttons is provided below.



If the cruise is from **Region 8** or **Region 9**, a different configuration of buttons is displayed. Volume equation entry for those regions is described below.

First, let's take a look at how other regions enter volume equations.

### *Entering Volume Equations and Requesting Biomass*

If the cruise file is an FScruiser file created using a template, the Volume Equation window would appear as follows:

**VOLUME EQUATIONS**

When adding or editing equations, select a region and forest to get a list of equations. Select equation and then complete the information on the row.

For new equations, select a species and equation from the lists provided. Complete the product code, minimum DIBs, and stump height.

Finally, check the volume flags to include BDFT, CUFT or Cords and whether secondary volume is to be calculated as well as total cubic volume.

Use the slider bar at the bottom to view remaining fields.

DELETE ROW

| Volume Equation Number | Model                           | Common Species Name | Species | Primary Product | Top DIB Primary |
|------------------------|---------------------------------|---------------------|---------|-----------------|-----------------|
| A00F32W042             | Rewelling Profile-32ft Log R... | Alaska yellow ce... | 042     | 01              | 6               |
| A00F32W242             | Rewelling Profile-32ft Log R... | Western redcedar    | 242     | 01              | 6               |
| A00F32W098             | Rewelling Profile-32ft Log R... | Sitka spruce        | 098     | 01              | 6               |
| A00F32W263             | Rewelling Profile-32ft Log R... | Western hemlock     | 263     | 01              | 6               |
| *                      |                                 |                     |         |                 |                 |

REGION FOREST EQUATION SPECIES PRODUCT

INSERT Cancel FINISHED

In some instances, the *Volume Equation Number*, *Model Name* and *Common Species Name* could be blank and only a list of Species codes and Primary Product code is shown. In that situation, the equation information needs to be added. First, let's finish the steps to complete these equation numbers.

## Completing Existing Equation Numbers

Let's make the window a little bigger by clicking the lower right corner with the mouse and resizing the window to look like this.

**VOLUME EQUATIONS**

When adding or editing equations, select a region and forest to get a list of equations. Select equation and then complete the information on the row.

For new equations, select a species and equation from the lists provided. Complete the product code, minimum DIBs, and stump height.

Finally, check the volume flags to include BDFT, CUFT or Cords and whether secondary volume is to be calculated as well as total cubic volume.

Use the slider bar at the bottom to view remaining fields.

DELETE ROW

| Volume Equation Number | Model                           | Common Species Name | Species | Primary Product | Top DIB Primary | Top DIB Secondary | Stump Height | Calc Total Cubic         | Calc BDFT Primary                   | Calc CUFT Primary                   | Calc Cords               | Calc Topwood                        | Calc Biomass             |
|------------------------|---------------------------------|---------------------|---------|-----------------|-----------------|-------------------|--------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| A00F32W042             | Rewelling Profile-32ft Log R... | Alaska yellow ce... | 042     | 01              | 6               | 0                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| A00F32W242             | Rewelling Profile-32ft Log R... | Western redcedar    | 242     | 01              | 6               | 0                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| A00F32W098             | Rewelling Profile-32ft Log R... | Sitka spruce        | 098     | 01              | 6               | 6                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| A00F32W263             | Rewelling Profile-32ft Log R... | Western hemlock     | 263     | 01              | 6               | 6                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| *                      |                                 |                     |         |                 |                 |                   |              | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |

REGION FOREST EQUATION SPECIES PRODUCT

INSERT

Cancel FINISHED

1. **Top DIB Primary and Top DIB Secondary** – If no values are entered in these fields, simply click the box and type in the desired value for each field.
2. **Stump Height** – Enter the desired stump height in this box.
3. **Volume check boxes** – These boxes are checked for the desired volume type for each equation listed. Clicking the box either checks or unchecks it depending on the current state.
4. **Calc Biomass** – It may be apparent by now, there is no weight equation window any more. Mainstem and topwood weight are calculated in the National Biomass Equation Library (NBEL) so there really are no equation numbers for weight any more. **Appendix H** details the components returned from NBEL when this box is checked.

So what happens if a new equation number is needed for a species? The steps below show how a new equation is entered.

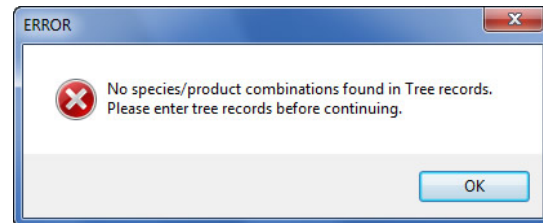
1. Click on the very first column to highlight a new row at the bottom of the list.
2. At the bottom of the window, the Region, Forest, Equation, Species and Product boxes are enabled.
3. Use the pulldown list to select the **REGION**.
4. Then select the **FOREST** from the next pulldown list.
5. Select the appropriate equation number from the next list.
6. Then select the **SPECIES** code and associated **PRODUCT** code.
7. Click the **INSERT** button at far right to add the equation to the list.

8. As above, enter the top DIB primary and secondary fields, the stump height and click the check box(es) for the desired volume and/or biomass to be calculated.

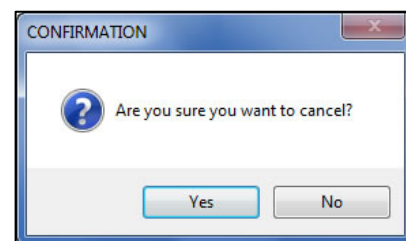
Now, what about the other buttons in the window?

The species and product codes in files with no equations entered are pulled from the tree records.

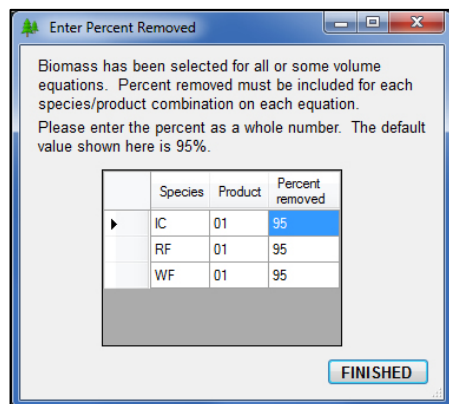
Sometimes, a new cruise file already contains volume equations for some species but not for others. There is no need to select volume equations for all species listed if you are certain those species are not going to be collected in this cruise. Simply highlight the desired row and click the **DELETE ROW** button to remove that species and/or volume equation. If no tree records were collected and the Volume Equation window is opened, an error message is given and no equation information may be recorded.



The **CANCEL** button can be used to close the window without saving any changes or additions. A warning message is displayed to confirm the cancel action. Simply click **YES** or **NO** to dismiss the window. Be aware clicking YES is **not** going to save any changes made. Clicking NO causes the equation window to remain open.



When everything is correctly updated or added, click the **FINISHED** button to close the window and save everything.



If biomass was requested, the **Percent Removed** must be entered for each species/product combination. A small window is displayed for entry of percent removed. A grid is shown with each species/product combination and the default percent removed of 95%. Type in a different percent removed as needed. Click the **FINISHED** button to save the data and close the window.

**NOTE:** *The Flewelling Profile Model now returns stump and tip volume. In order to get this volume, the Total Cubic flag must be checked when Flewelling equations are used.*

One difference in this method of entering equations is now the grid at the bottom with all the equation numbers can be edited. For example, if the stump heights changed for all the equations, you can now click in the Stump Height field and type in the different number for each row. Just be sure to click the **FINISHED** button to save those changes.

**Enter Volume Equations**

**VOLUME EQUATIONS**

When adding or editing equations, select a region and forest to get a list of equations. Select equation and then complete the information on the row.

For new equations, select a species and equation from the lists provided. Complete the product code, minimum DiBs, and stump height.

Finally, check the volume flags to include BDFT, CUFT or Cords and whether secondary volume is to be calculated as well as total cubic volume.

Use the slider bar at the bottom to view remaining fields.

| Volume Equation Number | Model                           | Common Species Name | Species | Primary Product | Top DiB Primary | Top DiB Secondary | Stump Height | Calc Total Cubic         | Calc BDFT Primary                   | Calc CUFT Primary                   | Calc Cords               | Calc Topwood                        | Calc Biomass                        |
|------------------------|---------------------------------|---------------------|---------|-----------------|-----------------|-------------------|--------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|
| A00F32W042             | Rewelling Profile-32ft Log R... | Alaska yellow ce... | 042     | 01              | 6               | 0                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| A00F32W242             | Rewelling Profile-32ft Log R... | Western redcedar    | 242     | 01              | 6               | 0                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| A00F32W098             | Rewelling Profile-32ft Log R... | Sitka spruce        | 098     | 01              | 6               | 6                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| A00F32W263             | Rewelling Profile-32ft Log R... | Western hemlock     | 263     | 01              | 6               | 6                 | 1            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| A00F32W263             | Rewelling Profile-32ft Log R... | Western hemlock     | 263     | 01              | 6               | 6                 | 1            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| *                      |                                 |                     |         |                 |                 |                   |              | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |

REGION:  FOREST:  EQUATION:  SPECIES:  PRODUCT:

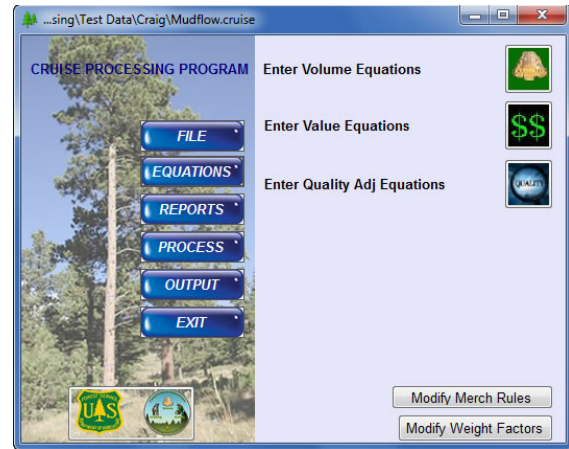
**X Button** – The X button in the upper right corner of the window functions like Cancel when clicked. **No data is saved when this button is selected.** This functionality is subject to change in the future.

## Modify Weight Factors

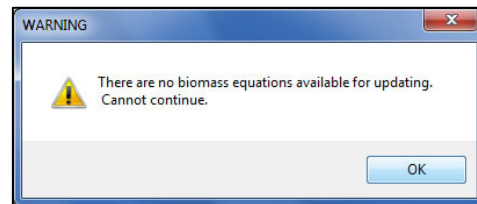
This button is located in the lower right corner of the **EQUATIONS** window. Weight factors for biomass equations could change for an individual sale so this button allows these factors to be modified. They are stored with the cruise and not with the regional defaults for the biomass equations.



**Only Measurement Specialists have permission to change weight factors. This feature has a security question before it can be accessed.**



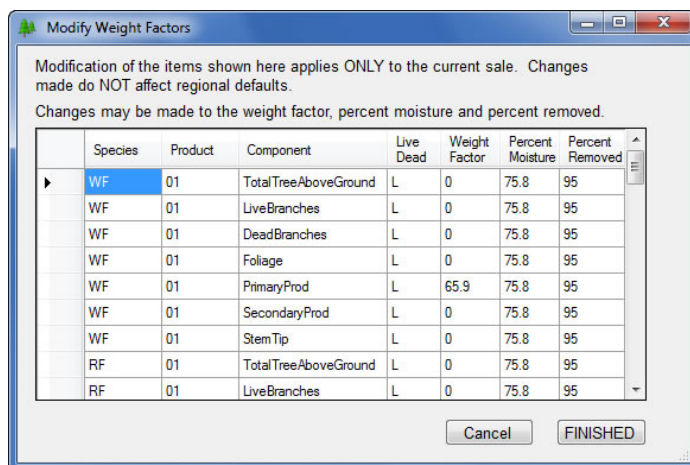
If there are no biomass equations to edit, a warning message is displayed. Click **OK** to dismiss the message.



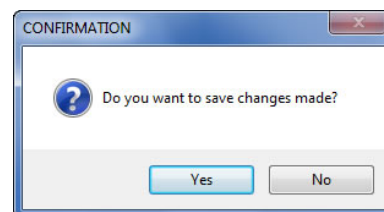
If the answer to the security question is accepted and there are equations to edit, a window is displayed where weight factors as well as percent moisture and percent removed can be modified. Note the message at the top of the window. **Changes made in this window apply to the current sale only.**



**NOTE:** The following columns are read-only and the data in those columns cannot be modified: Species, Product, Component, and LiveDead.



To make changes, click in the desired cell and type in the data. When all changes have been made, click **FINISHED** to save the changes and close the window. A confirmation message is displayed. Clicking **YES** saves the changes and closes all windows. Clicking **NO** closes the message box and leaves the **Modify Weight Factors** window open.



## Modify Merch Rules

When this button is clicked, the following window is opened. It is not password protected at this time. Changes made to merchandizing rules in this window apply to the **current sale only**. They are not saved as regional defaults. Additionally, changes are only made to non-sawtimber products. And, the changes apply to current volume equations for all species assigned that particular equation. A description of each field is given below.

Modify Merchandizing Rules

To view merchandizing rules for a non-sawtimber product, select a product from the list below.

Non-sawtimber Products: 08

If no changes have been made to the merch rules, the values shown here are from the regional merch rules. If changes have been made to the merch rules, those values are shown below. Use the buttons below to scroll through the list to see each set of rules by equation number. When finished making modifications, click the FINISHED button below to apply changes to every species for the non-sawtimber product.

Current Volume Equation: 500W02W202

Trim (<1): 0.5

Minimum log length: 2

Maximum log length: 16

Segmentation logic: 22 -- Top placed with next lowest log

Minimum merch length: 8

Segment Length: ☒ Even length only (default) ☐ Odd length allowed

Stump height: 0.5

Top DIB: 1

Previous Next FINISHED

**Current Volume Equation** – displays the equation currently available for modification. It is read only and changes made apply to all species/products assigned the current volume equation.

**Non-sawtimber Products** – if more than one product code is used for these products, the list becomes a pulldown with all product codes listed. Selecting one from the list populates the remaining items in the window with either the regional defaults or any existing values for each item.

**Trim (<1)** – enter the desired value for trim.

**Minimum and Maximum log length** – each of these items can be modified by clicking either the up or down arrow. The value cannot be less than 2 and increments by 2 when the up arrow is clicked.

**Segmentation logic** – currently, four options are available for segmentation logic:

- o 21 -- If top seg < 1/2 nom log len, combine with next lowest log
- o 22 -- Top placed with next lowest log and segmented
- o 23 -- Top segment stands on its own

- o 24 -- If top seg < 1/4 log len drop the top. If top >= 1/4 and <= 3/4 nom length, top is 1/2 of nom log length, else top is nom log len.

Select the option to be used by clicking on one item.

**Minimum merch length** – this works in a similar manner as the min/max log length items and increments by 2 when the up arrow is clicked.

**Segment Length** – the default in the program is **even length only** so the radio button is automatically selected. To use odd length instead, simply click the button next to **Odd length allowed**. Only one of these buttons can be selected.

**Stump height and Top DIB** – enter the desired value for each of these items.

Clicking the **Next** or **Previous** button displays the appropriate volume equation information for modifying. The list circles around when the last or first record is encountered. So when the **Previous** button is clicked at the beginning of the list, the last record is displayed. Conversely, clicking **Next** at the end of the list, displays the first record in the list.

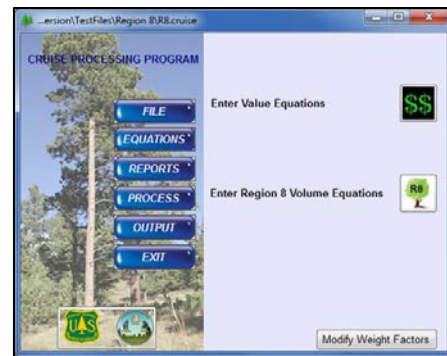
When modifications are complete, click the **FINISHED** button to close the window and save the changes.



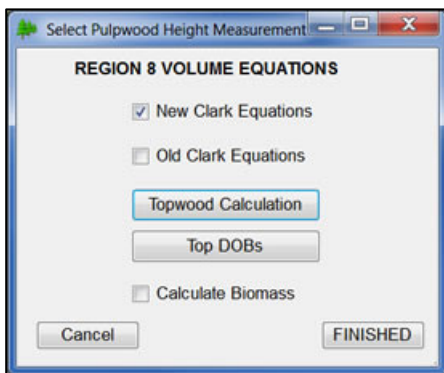
**NOTE:** *When this window is initially displayed, the buttons Previous, Next and FINISHED are disabled. Once a nonsawtimber product is selected, these buttons are enabled. However, if only one volume equation is noted for that nonsawtimber product, the Previous and Next buttons remain disabled. This is because there are no volume equations to scroll through. The FINISHED button will be available to save any edits made for that one equation.*

## Region 8 Volume Equation Entry

When a file from Region 8 is detected and the **EQUATIONS** button is clicked, the window at right is displayed. It is slightly different from the general equation window shown above. The button at the top is gone and an additional button just for Region 8 is shown at the bottom of the list.

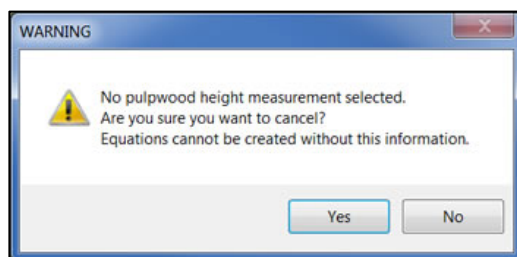
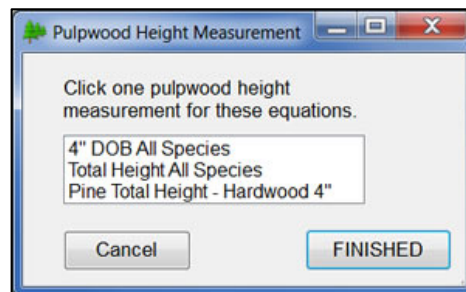


Clicking the **R8** button displays the following window. There are two equation options, **new Clark Equations** and **old Clark Equations**. The new Clark Equations do not require an indication of pulpwood height measurement. Click on one or the other option to start the process.



For the new Clark equations, the topwood calculation for each species can still be selected as described below. Additionally, the top DOBs can be modified regardless of product.

The old Clark equations function as before. These do require a selection of pulpwood height measurement. When this checkbox is selected, the following window opens where the measurement can be selected.

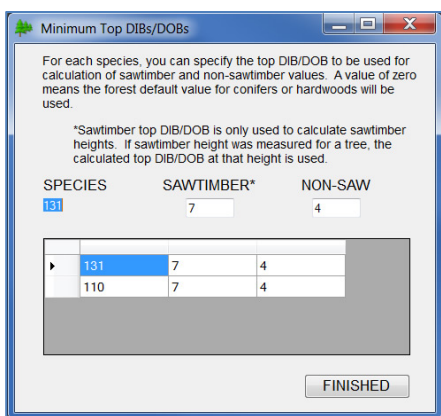
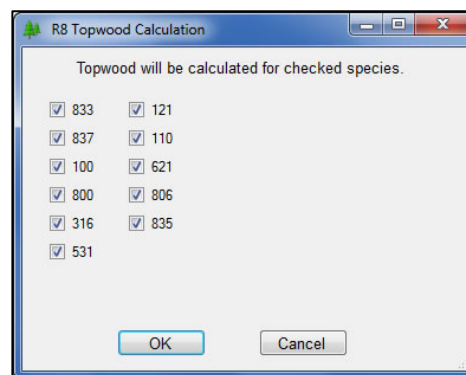


It is necessary for a measurement to be selected for the equations to be created. Click **FINISHED** when the selection has been made and to close the window. Clicking the **Cancel** button without selecting a measurement displays a warning message.

Additionally, the topwood calculation can be set for select species as well as modification of the top DOBs by species. See below for more details on using these functions.

If topwood is to be calculated, click on the **Topwood Calculation** button. From this window, check the species (or uncheck) the species to indicate topwood is (or is not) to be calculated.

Clicking the **OK** button adds the appropriate equations or flags for topwood into the table. Clicking **Cancel** without clicking **OK** does not add equations. Clicking **Cancel** after **OK** merely closes the window.



When the **Top DOBs** button is clicked, the window at left is displayed. The DOB for an individual species can be changed by placing the cursor in the sawtimber or non-saw box and typing in the updated DOB. The new DOB is placed in the appropriate box in the grid below. **NOTE:** The grid CANNOT be edited directly. Also, see below for further description of this window under Region 9 Volume Equations.

When modifications are complete, click the **FINISHED** button to save the changes and close the window. It is important to note that changes made are applied to the current cruise and do not affect any regional defaults.

Check with the Regional Measurement Specialist for questions regarding use of this window.

### *Adding Biomass Equations for Region 8*

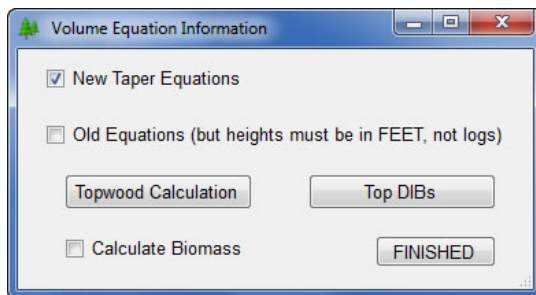
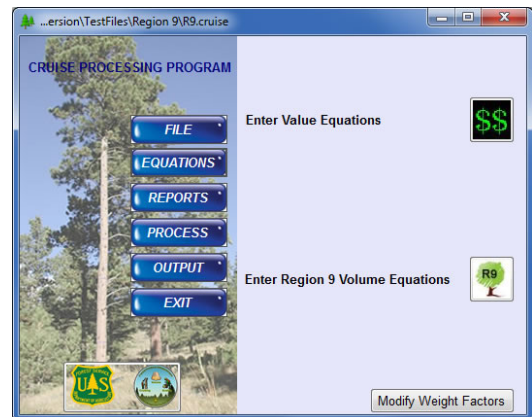
A new checkbox has been added to the main window for Region 8 Volume Equations. As mentioned above, no weight equations are entered in *CruiseProcessing*. All weight and biomass calculations are now done through the biomass library. For Region 8 users to get biomass and weight, this checkbox was added. When this is checked, the biomass library is called to get the Region 8 default equations. If there are no default equations for this region, the national default is used. Biomass equations are stored in the file for every species.

**X Button** – The X button in the upper right corner of the window functions like Cancel when clicked. **No data is saved when this button is selected.** This functionality is subject to change in the future.

**NOTE:** *Template files for Region 8 volume equations cannot be edited. Volume equations for cruise files will need to be created by selecting Region 8 Equations in the Equations window.*

## Region 9 Volume Equation Entry

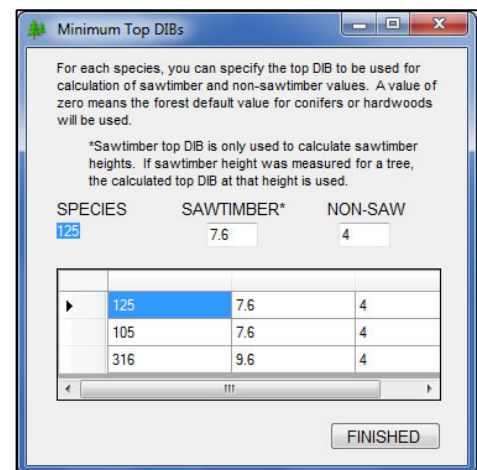
When a file from Region 9 is detected and the **EQUATIONS** button is clicked, the equations menu appears as shown at right. Clicking the **R9** button shows the following window.



The user can select the set of volume equations to be used. The old equations are those used in the older National Cruise program. The new equations are the more flexible taper model equations based on the work of Clark and others. **Heights must be recorded in feet in order to use the new equations.**

When the New Equations are selected, the **Top DIBs** button is enabled. This button opens a separate window allowing the user to specify the minimum upper diameter (inside the bark) to which volumes are calculated.

When the **Top DIBs** button is clicked the window at right is displayed, although the species codes will match those in the cruise file. The user can change the sawtimber and non-sawtimber DIB values used for volume calculations. This is done for a particular species by clicking on the record in the bottom box displaying the species code to be changed. A value of zero means the default values are used.

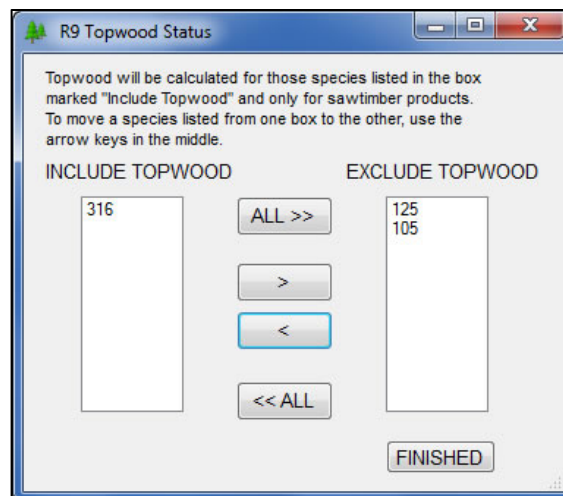


In the example at right, species 316 was selected and the sawtimber DIB changed to 9.6 and the non-sawtimber DIB changed to 4.0. This means all non-sawtimber volumes (pulpwood, posts, topwood, etc.) for species 316 are calculated to a 4-inch top. For any sawtimber tree with no sawtimber height recorded, the sawtimber height is calculated to the point where the tree is 8 inches in diameter inside the bark. Please note the value entered as the sawtimber DIB is ignored for trees with a sawtimber height recorded. For those trees the diameter calculated at the recorded sawtimber height is used for the calculation of sawtimber volume.

Once all the desired DIBs have been modified, clicking the **FINISHED** button saves the changes and returns to the previous window. Clicking the X button in the upper-right of the window

cancels any changes made. *Please note that opening the Top DIBs window again without first exiting the volume equation window will undo any changes just made. Changes are not written to the cruise object until the Volume Equation window is closed.*

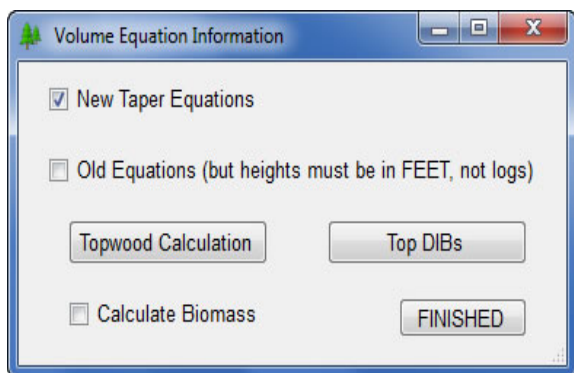
For both type of equations (new and old), the **Topwood Calculation** button displays the window shown at right, although the species codes will be for the sawtimber species found in the cruise object. As the message at the top indicates, any species listed in the **Include Topwood** box has topwood included when the volumes are calculated. The arrow buttons in the middle of the window are used to move species codes from one window to the other.



In the example to the right, species 316 moved to the **Include Topwood** box by highlighting it in the right box and clicking on the left arrow button in the middle. When volumes are calculated, topwood for species 316 will be included in the calculations.

When all the species listed in either box are to be moved to the other box, use the **ALL>>** or **<<ALL** buttons to do the move in one click.

Clicking the **FINISHED** button saves the selections made and closes the window. Clicking the X button in the upper-right of the window cancels any changes made.



### *Adding Biomass Equations for Region 9*

A new checkbox has been added to the main window for Region 9 Volume Equations. As mentioned above, no weight equations are entered in CruiseProcessing. All weight and biomass calculations are now done through the biomass library. For Region 9 users to get biomass and weight, this checkbox was added. When this is checked, the biomass library is called to get the Region 9 default equations. If there are no default equations for this region, the national default is

used. Biomass equations are stored in the file for every species.



**NOTE:** *Template files for Region 9 volume equations cannot be edited. Volume equations for cruise files will need to be created by selecting Region 9 Equations in the Equations window.*

## Value Equations Window

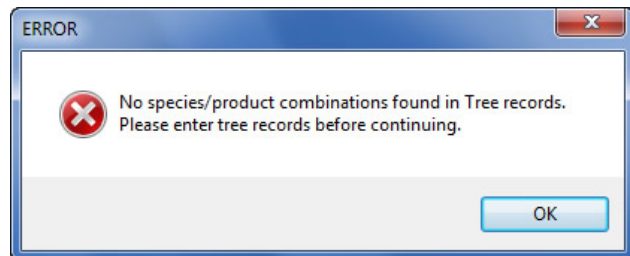
Similar to the **Volume Equations** window, this window displays all the information associated with **Value Equations**. The major difference is the entry and display of the coefficients needed to calculate value. A grid is shown with a list of species and primary product already entered. Completing the list is described below. A list of available value equations can be found in **Appendix B**.

| Value Equation Number | Species | Primary Product | Grade | Coefficient 1 | Coefficient 2 | Coefficient 3 | Coefficient 4 | Coefficient 5 |
|-----------------------|---------|-----------------|-------|---------------|---------------|---------------|---------------|---------------|
| 042                   | 01      |                 |       | 0             | 0             | 0             | 0             | 0             |
| 098                   | 01      |                 |       | 0             | 0             | 0             | 0             | 0             |
| 242                   | 01      |                 |       | 0             | 0             | 0             | 0             | 0             |
| 263                   | 01      |                 |       | 0             | 0             | 0             | 0             | 0             |
| *                     |         |                 |       |               |               |               |               |               |

As with the Volume Equations window, clicking on a new row enables the **REGION**, **EQUATION**, **SPECIES** and **PRIMARY PRODUCT** items at the bottom of the window. To enter the new row, select the Region then the equation number, species and primary product from the pulldown boxes. Next, click the **INSERT** button to add the row to the list.

The **GRADE** and **COEFFICIENT** fields are completed by the user with the appropriate values for the equation.

Sometimes, a new cruise file already contains value equations for some species but not for others. There is no need to select value equations for all species listed if you are certain those species are not going to be collected in this cruise. Simply highlight the desired row and click the **DELETE ROW** button to remove that species and/or value equation. If no tree records were collected and the Value Equation window is opened, an error message is given and no equation information may be recorded.



Once the list is complete, click the **FINISHED** button to save the changes and close the window.

**X Button** – The X button in the upper right corner of the window functions like Cancel when clicked. **No data is saved when this button is selected.** This functionality is subject to change in the future.

### *Quality Adjustment Equations Window (Region 3)*



***NOTE: This section has been removed at the request of the Region 3 Measurement Specialist.***

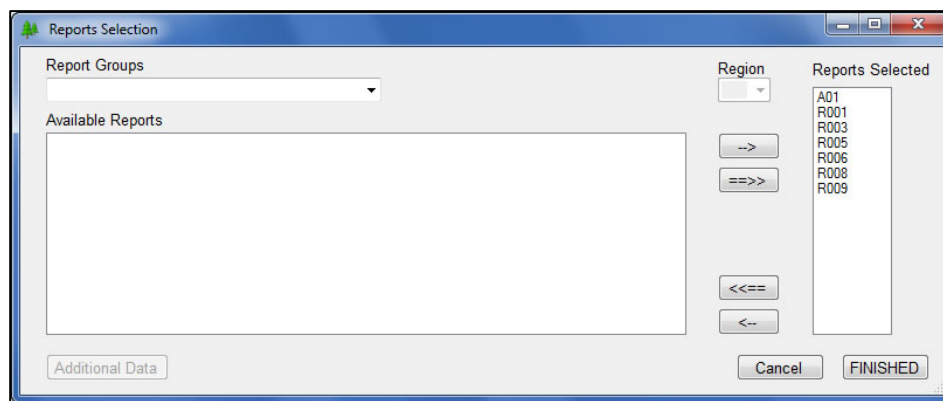
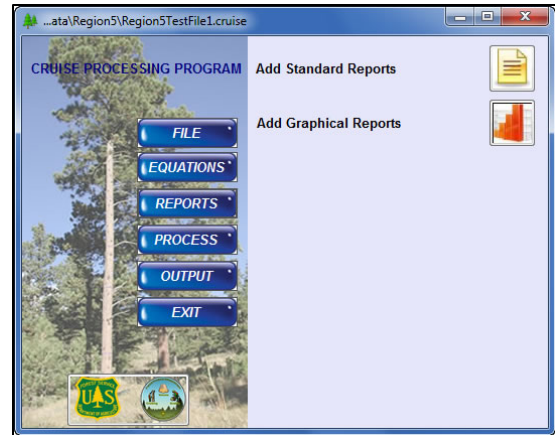


# REPORTS SECTION

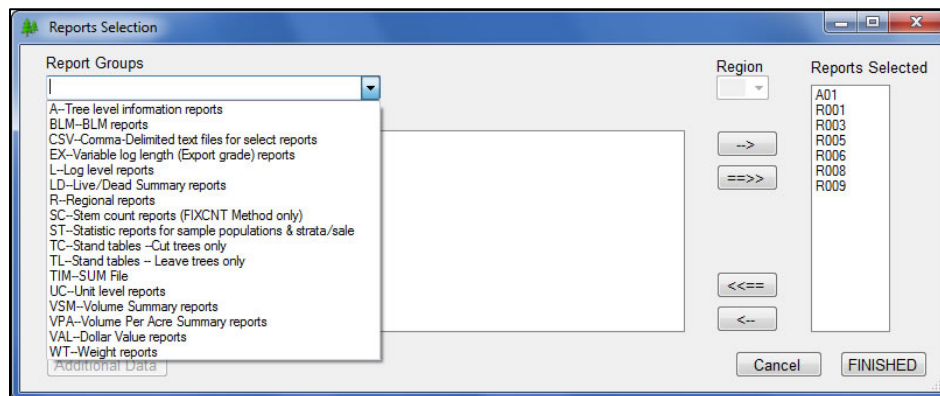
## Modifying the Reports List

When the **REPORTS** button is clicked on the main menu, two buttons appear. The first button, **Add Standard Reports**, allows the user to make changes to the reports list or add reports if none have been selected. The second button, **Add Graphical Reports**, is described below.

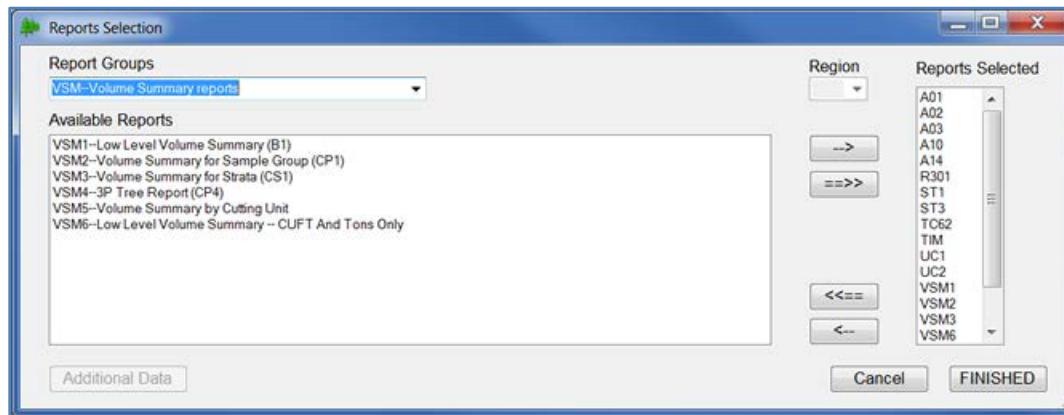
The **Reports Selection** window is separated into three main sections.



**Report Groups** contains a list of all the report categories as shown in **Appendix D** (except for graphs which are described later).



When a group is selected, all available reports within the group are displayed in the **Available Reports** window on the left. One or more reports are selected from this window and the appropriate arrow in the middle is clicked to move the report to the **Reports Selected** window on the right.



After all reports are added, click the **Finished** button to close the window and save the reports selected.

Conversely, if reports are to be removed from the **Reports Selected** list, simply highlight the desired report and click the last button in the middle, the left pointing arrow. The report is removed from the list.

The third button in the list (<<=>), when clicked, removes **ALL** of the reports in the **Reports Selected** window. This would be starting the reports selection from scratch. **Use this button with caution.** If the Finished button is clicked after clicking this arrow button, **NO REPORTS ARE SAVED IN THE CRUISE OBJECT.**

The **X button** in the upper right corner of the window functions like **Cancel** when clicked. **No data is saved when this button is selected.** No warning message is given when the X button is clicked. Changes made are **NOT** saved. This functionality is subject to change in the future.

### *Selecting Regional Reports*

To select a regional report, select the appropriate group (**R – Regional reports**) and the **Region** window at upper middle is enabled. Use the pulldown list to select a region and the available reports are displayed in the window on the left (**Available Reports**). Select from these regional reports just as any of the standard reports.

### *Slash Loading Summary Report (WT2 and WT3)*

The WT2 and WT3 reports estimate the oven-dry weight of slash generated from the trees to be cut in the cruise using the Biomass Library which is part of the Volume Library. In the WT2, the data are reported by strata, one page per stratum, with an overall sale summary on the last page. The WT3 reports data by cutting unit, one page per unit. Each report estimates the dry weight of branches, needles, unutilized top wood, and cull volume the user estimates will be left on the unit. The WT2 includes a section for damaged small trees.

## Selecting the Report

The Slash Loading Summary reports (WT2 and WT3) are selected by clicking on the appropriate group in the Report Groups list. No additional information is required as the biomass portion of the Volume Library handles all the information necessary for this report.

## Fraction Left in the Woods

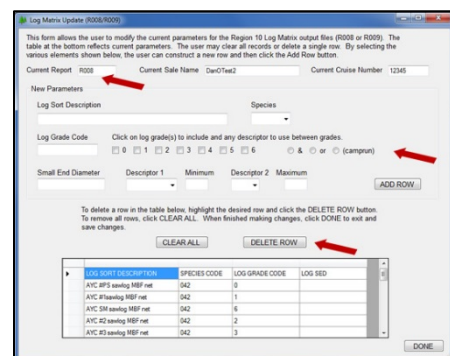
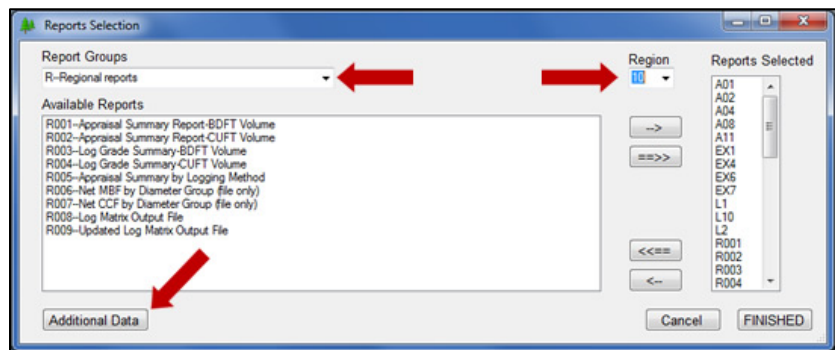
Since the percent removed was entered when biomass was selected in the volume equations, FLIW is now calculated in the report as 1.0 minus the percent removed.

## Additional Data for Select Reports

When certain reports are selected, the **Additional Data** button in the lower left corner is enabled.

Currently, only Region 10 Regional Reports will need additional data. This is where the Log Matrix for report R008 and R009 is loaded and updated. The steps for accessing the Log Matrix are shown here:

1. Select **Reports** from the **Main Menu**.
2. Select **Add Standard Reports**.
3. From the pulldown list in **Report Groups**, click on **Regional reports**.
4. From the pulldown list **Region**, click on **10**.  
The available regional reports are displayed in the box. The **Additional Data** button is now enabled.
5. Click on **Additional Data**.
6. Only authorized users are allowed to modify the log matrix. **A password is required to access the edit screen.** A series of questions guide the user through the process of editing the log matrix for these reports.
7. The window at right is displayed. Since the log matrix is different for each report, each is displayed separately. If no records existed in the log matrix table, this list will show the default values. These can be edited by adding or deleting rows. Rows cannot be edited in the grid at the bottom. To update data in a particular row, delete the row and then complete the information fields at the top and then click on **ADD ROW**. Alternatively, enter the log sort description for the row and complete the rest of the fields. Click

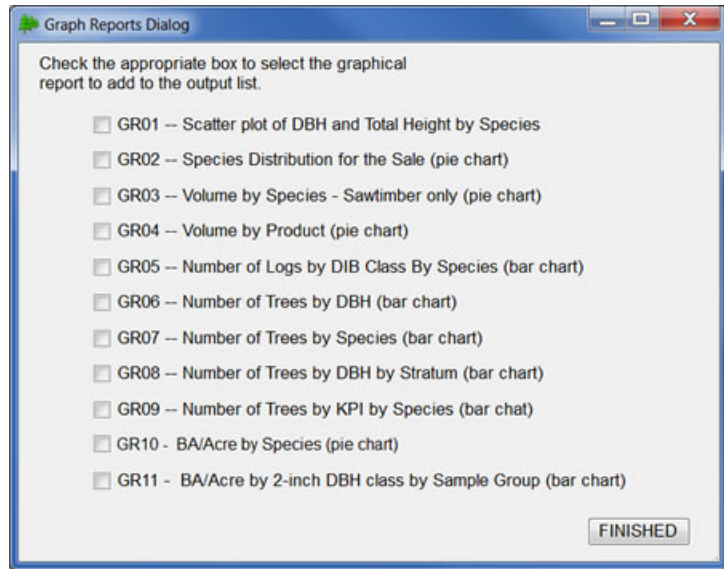


on **ADD ROW** and the updated row is placed in the grid at the bottom. Delete the original row to prevent duplicates.

8. When all edits are complete, click on the **DONE** button to close the window and save the edits.
9. If report selection is complete, click on the **FINISHED** button to close the **Reports** window.

## Add Graphical Reports

This new section gives users several types of graphs to include in the output file. When this button is clicked, a menu is shown with the various graphical reports currently available. In this example, three reports have been selected and are added to the reports list. At this point in the program, this is the only thing that needs to be completed. Further description of the process is included in the **Output Section** below. Descriptions and examples of each graph are given in **Appendix D**. Click the **FINISHED** button to save the selections and close the window.



If graphs are no longer needed, they may be removed from the reports list as any other report is deleted. Simply open the regular reports list and use the arrows to remove any highlighted graph report.



**NOTE:** GR09 displays data from 3P strata ONLY. GR10 and GR11 display information from strata utilizing a Basal Area Factor.

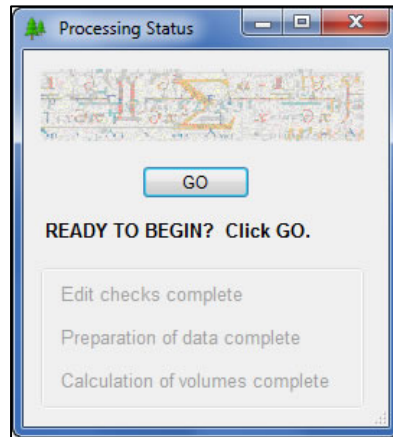


# PROCESS DATA SECTION

## Processing Data

When the **PROCESS** button is clicked on the Main window, this **Processing Status** window is displayed. Three things happen in this section:

- Data is edit checked
- Data is prepared for remaining calculations
- Volumes, value and/or biomass are calculated



### How to start processing...

Click the **GO** button to begin the process.

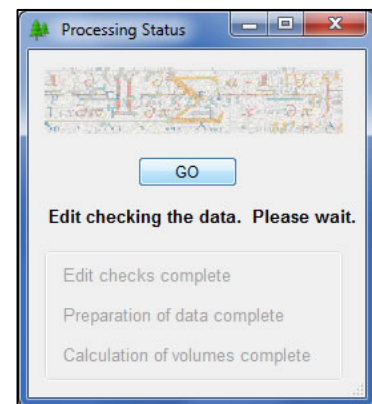
### What happens after GO...

Once the GO button is clicked, edit checking starts. Edit checking is very thorough and might take quite some time to complete depending on the size of the file. The cursor becomes the "wait" signal as the checks are completed.



*Most edit checks completed in the DOS version of NatCRS and the current version of CruiseProcessing have been included in the new CruiseProcessing.*

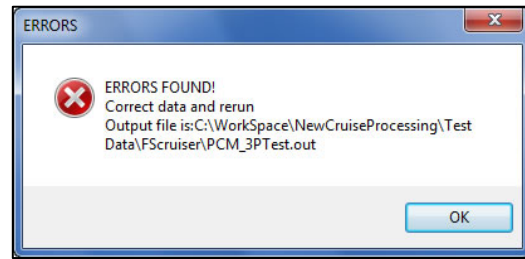
Several new checks have been added to the new program. Some interrelationships between tables necessitated additional checks which would normally have passed the edit checks in previous versions. A list of potential error messages is located in **Appendix G**.



### What happens during edit checking...

As the data is checked, the **Processing Status** window indicates the edit checks are progressing. If the data passes all of the edit checks, the status shows **Edit checks complete**.

If the data fails the edit checks, a message is displayed. Clicking **OK** dismisses the window.



These are considered fatal errors and stop the processing. It does **NOT** terminate the entire program. An error report (see example below) is generated and can be printed for review. The error report also automatically opens in the preview window. When the preview window is closed, the program terminates to prevent the text output file from being generated on erroneous data. A maximum of 200 errors automatically stops processing and generates the error report.

If any CruiseManager/FScruiser errors are detected, this error report also opens in a preview window for review. When the window is closed, the program terminates.

**Notice the warning message gives the complete filename for the output file containing the error report.**

If the cruise is being processed before all data has been collected, some strata may not have any trees recorded. This situation no longer stops processing. It could be the cruisers simply wish to see how data collection is progressing. Whatever the reason may be, a warning message is displayed allowing the user to decide if they wish to continue with processing.

## Error Report Example

Here's an example of a very short error report. A description of each column --

- **Table name** – indicates which table contains the error
- **Error message** – the error number along with the text message
- **ST** – stratum number
- **CU** – cutting unit number
- **PL** – plot number
- **TR** – tree number
- **LG** – log number
- **SP** – species code
- **SG** – sample group
- **PR** – primary product
- **EQ** – equation number



Since the new system does not permit editing a text file, errors need to be corrected using the data entry program, *FScruiser* or *CruiseManager*.

The report shows the source of the errors, either *CruiseProcessing* or *FScruiser/CruiseManager*. Once the errors have been corrected, the data can then be reprocessed.

```
RUN DATE & TIME 10/14/2014 3:33:49 PM                                     PAGE 1
FILENAME: C:\Workspace\NewCruiseProcessing\Test Data\FScruiser\Jeff\STR.out
***** ERROR REPORT *****
                                FOR CRUISE NUMBER
                                70002

THESE ERRORS WERE GENERATED BY CruiseProcessing

TABLE
Tree          4-Secondary top DIB is greater than primary top DIB      01 001      1 --- DF      DF 01
Tree          32-No height recorded for this tree                     01 001      1 --- DF      DF 01

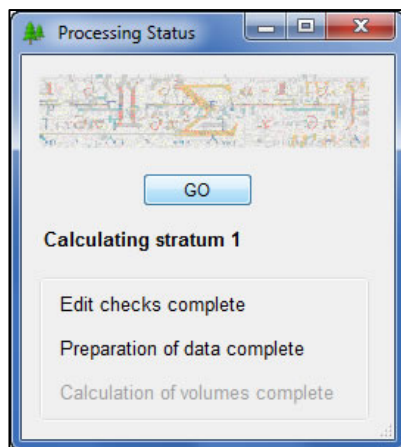
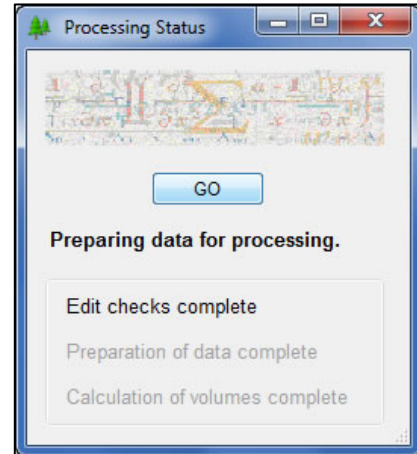
Order of Identification Elements
Some elements may be blank
ST = Stratum
CU = Cutting Unit
PL = Plot
TR = Tree number
LG = log number
SP = Species
SG = Sample Group
PR = Primary Product
EQ = Equation
```

### *Errors from FScruiser*

In the new system, some error checking has been moved to *FScruiser*. Prior to the edit checks done in *CruiseProcessing*, the program checks for errors noted in the file from *FScruiser*. An error report similar to the one above is created and allows the user to check on these errors and correct them in *FScruiser* or *Cruise Manager* as needed.

### *After a clean edit check...*

When the edit checks are completed and the data is ready for processing, the status window indicates the edit checks are complete and data is being prepared for processing.

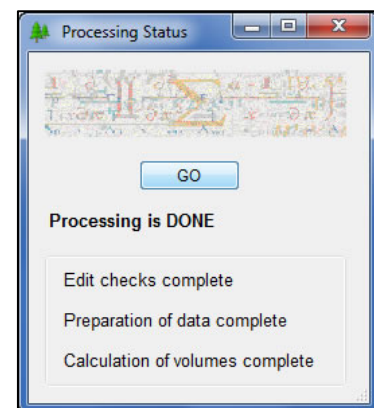


### *Preparing Data*

In this step, the data is grouped by identifying factors such as sample groups, strata, cutting units, etc. Number of trees is calculated. KPI and counts are summed. Expansion factors are calculated. Once the preparatory work is completed, the status window indicates everything is ready for volume calculations.

### *Calculating Volumes*

Now the program is grinding out volumes: BDFT, CUFT or cords for primary and/or secondary products as indicated by the Volume Equations table. All of the volumes calculated are stored in the tree calculated values table and/or log table as appropriate. If value and biomass were requested, these calculations are also completed at this time and are stored in the database. Once calculating volumes is complete, the status window indicates processing is totally finished.



 **NOTE:** Be aware that once calculations are completed the window remains open for a few seconds and closes automatically whenever all data is saved and the database is closed. **BE PATIENT! DO NOT CLOSE THE WINDOW USING THE X BUTTON ON THE UPPER RIGHT. JUST WAIT UNTIL THE WINDOW CLOSSES ON ITS OWN.**

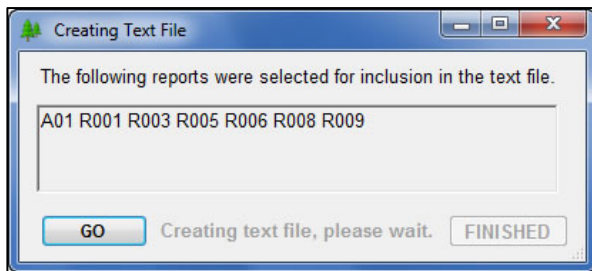
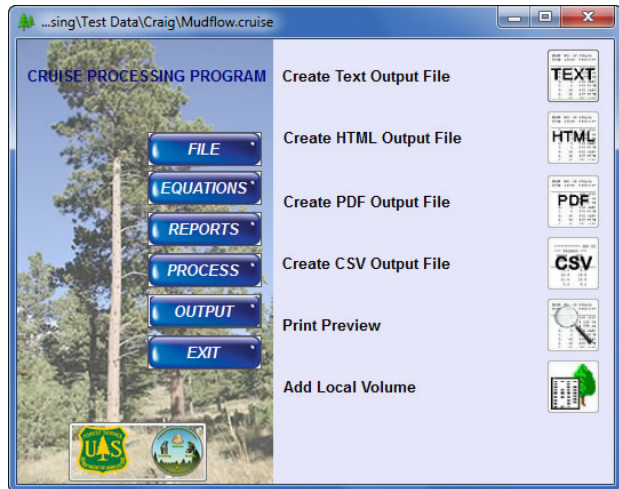


# OUTPUT SECTION

## Generating Reports

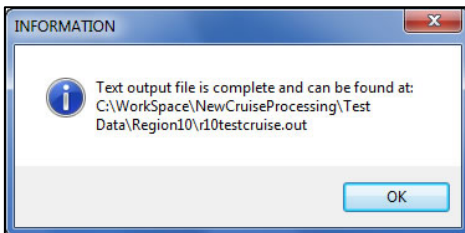
When equation numbers have been selected, reports selected, and processing completed, the output file can be created. The **OUTPUT** button displays a submenu of options for generating reports.

- Create Text Output File
- Create HTML Output File
- Create PDF Output File
- Create CSV Output File
- Print Preview
- Add Local Volume



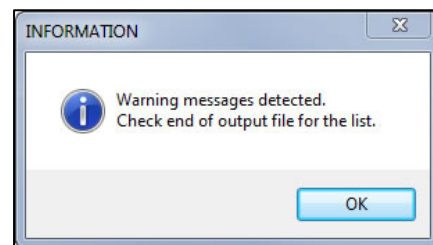
### Create Text Output File

Clicking on the **TEXT** button opens a small window showing the reports selected. If the reports list is satisfactory, click the **GO** button to generate the output file. As the reports are created, the grayed out text becomes black and the wait cursor activated.



When all the reports are completed, a message is shown indicating where the output file is located. Close the window by clicking the **OK** button.

Occasionally, warning messages are added at the end of the text output file. In previous versions of the program, users may not have been aware these warnings were generated. Now, a message box is displayed directing the user to check the end of the output file for these warning messages.

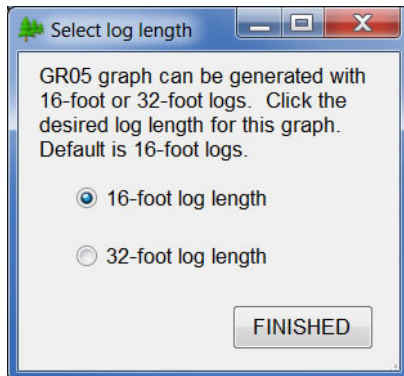
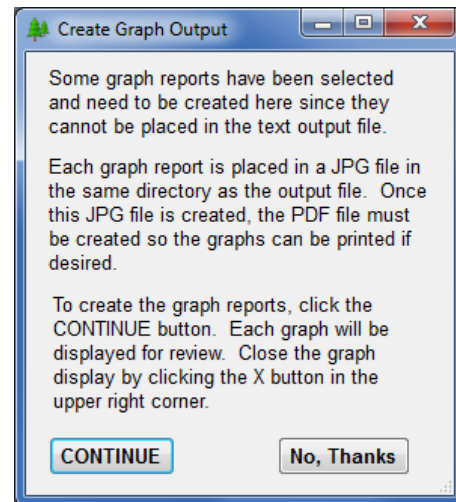


### *Graphs in the Reports List*

When **Graphs** are included in the reports list, the numbers are shown in the list just like other reports. However, what happens is different.

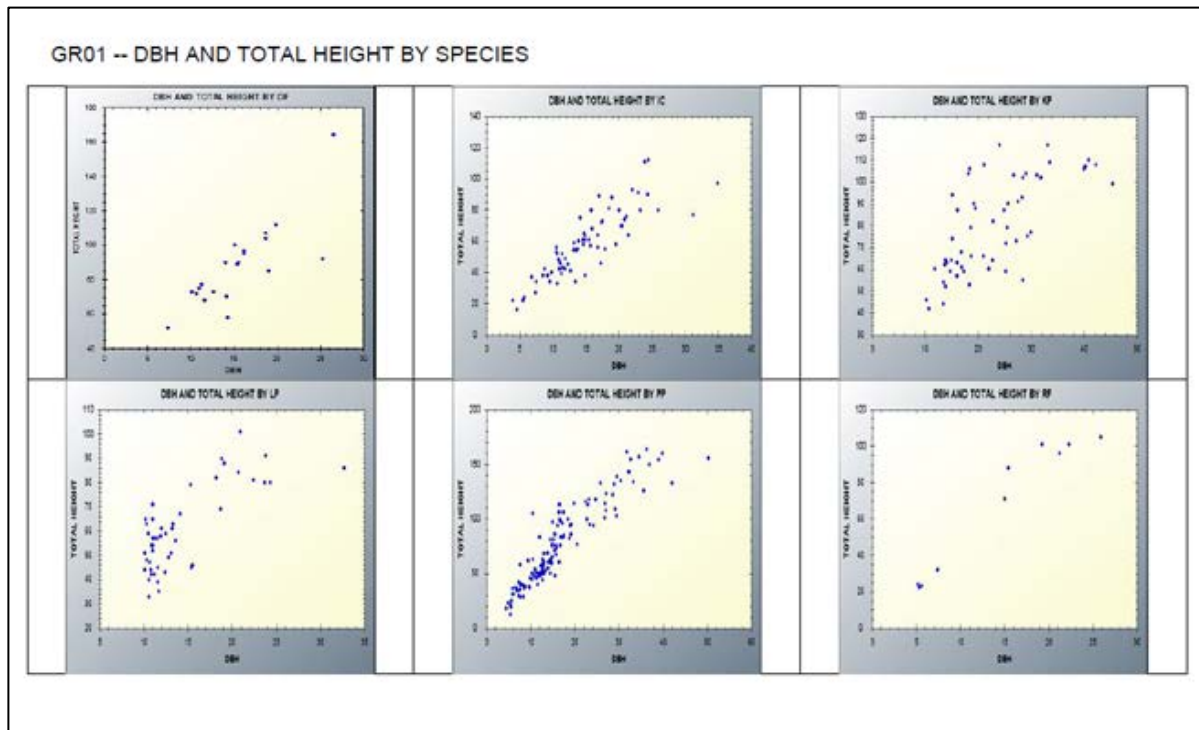
The window at right is displayed, giving the user the option to continue with producing the graphs. All graphs are created as **JPG** files which cannot be placed in the text output file. When they are generated, all are placed in the same directory as the cruise file and in a separate folder titled “Graphs”.

When **CONTINUE** is clicked, each graph is displayed for the user to review. In some instances, one graph per species is shown depending on the graph selected. After reviewing the graph, close the window using the red X button in the upper right corner of the window. The output window is displayed again and clicking the **FINISHED** button closes the window.



***NOTE: The GR05 graph has been modified to allow the user a choice between 16-foot and 32- foot log lengths. Click on one or the other to have logs of those lengths only in the graph. Any log length other than 16 or 32 will be dropped from the graph.***

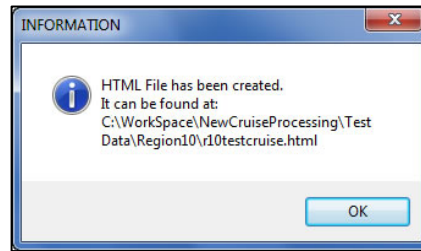
Since the graphs are stored in a separate folder and are individual JPG files, they may be printed as individual pages. And, since they are not added to the text output file, another option is to create the PDF file where the graphs are added at the bottom of the file. Here's a simple example of how they are displayed in the PDF file. This happens to be the first graph report which shows a scatterplot for each species in the cruise. Other graphs would display in a similar manner.



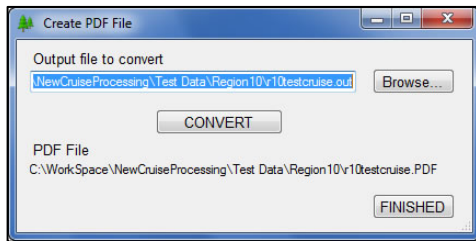
See **Appendix D** for a complete explanation of each graph.

### Creating HTML Output

Clicking the second button on the menu creates an **HTML** file from the text file. The process automatically starts and displays an information message when complete and where it can be found.

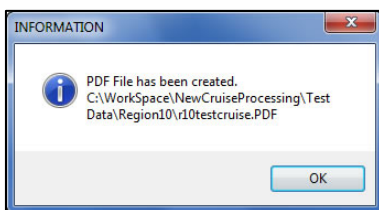
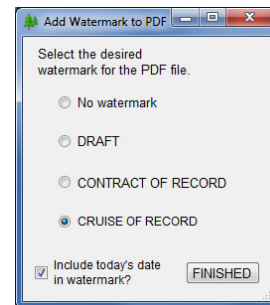


### Creating a PDF File



Clicking the third button on the menu creates a PDF file. In this case, a small window opens allowing the user to select the file to convert to a PDF. The text output file **MUST** be created prior to requesting a PDF conversion. The current output file is shown as the default or use the **Browse...** button to locate the text file to convert. Click the **CONVERT** button to start the process.

Before the file is completed, the user is given the option to add a watermark to the file. Four options are available: No watermark; “DRAFT” watermark; “CONTRACT OF RECORD” watermark or “CRUISE OF RECORD” watermark. The default is no watermark. Another option is to include the current date in the watermark. Simply click on the options desired and click **FINISHED** to close the window.



When the conversion is complete, note the path and filename of the PDF file and click **FINISHED** to close the window.

As mentioned above, if graphs were created, they are automatically added at the end of the PDF file.

## Creating CSV Files

When this button is clicked, the list of possible CSV files is displayed. Eleven CSV files are now available. The text output file **must** be generated before these files are created. The associated report must be requested in the text file for the CSV file to get created. For example, CSV2 uses the A05 report to create the file so the A05 report must be requested in the text file. Simply check each box for the desired CSV files and click the **Create Files** button to begin the process. A message is displayed when all requested CSV files have been created. Click the **FINISHED** button to close the window.



**NOTE:** Only one CSV file does not require a corresponding text report. CSV9 uses two to three tables from the cruise file to generate the necessary data for the CSV file.

Select CSV files to create by checking the box.

- ☐ CSV1 -- Comma-delimited text file from the A05 report
- ☐ CSV2 -- Comma-delimited text file from the A06 report
- ☐ CSV3 -- Comma-delimited text file from the A07 report
- ☐ CSV4 -- Comma-delimited text file from the A10 report
- ☐ CSV5 -- Comma-delimited text file from the L1 report
- ☐ CSV6 -- Comma-delimited text file from the L2 report
- ☐ CSV7 -- Comma-delimited text file from the ST1 report
- ☐ CSV8 -- Comma-delimited text file from the UC5 report
- ☐ CSV9 -- Comma-delimited text file from Tree Estimate Table
- ☐ CSV10 -- Comma-delimited file for Timber Theft
- ☐ CSV11 -- Comma-delimited test file from VSM4 Report

Create Files FINISHED

## Print Preview

Clicking the **PREVIEW** button on the menu opens a preview window of the current text output file. The window may be resized by dragging the lower right corner with the mouse. Scroll bars may also be used to move the text around for viewing. Other output files may be viewed by using the **Browse...** button to navigate to their location for opening. When finished reviewing the file, click **Cancel** to close the window.

Print Preview

Browse... File currently viewed... C:\WorkSpace\NewCruiseProcessing\Test Data\Region10\10testcruise.out

CRUISE#: 05092 SALE#: 05092  
SALENAME: Region 10 Test Cruise  
VERSION: DRAFT.2013  
RUN DATE & TIME: 11/25/2013 11:12:20 AM  
VERSION: 09.23.2013

VOLUME LIBRARY

| SPECIES | PROD | VOLUME<br>EQUATION | STUMP<br>HEIGHT | TOTAL<br>CUBIC<br>VOLUME | PRIMARY<br>PRODUCT |      |      |       | SECONDARY<br>PRODUCT |      |      |       |    |
|---------|------|--------------------|-----------------|--------------------------|--------------------|------|------|-------|----------------------|------|------|-------|----|
|         |      |                    |                 |                          | MIN<br>TOP<br>DIB  | BDFT | CUFT | CORDS | MIN<br>TOP<br>DIB    | BDFT | CUFT | CORDS |    |
| BIOMASS |      |                    |                 |                          |                    |      |      |       |                      |      |      |       |    |
| 042     | 01   | A00F32W042         | 1.0             | NO                       | 6.0                | YES  | YES  | NO    | 0.0                  | NO   | NO   | NO    | NO |
| 242     | 01   | A00F32W242         | 1.0             | NO                       | 6.0                | YES  | YES  | NO    | 0.0                  | NO   | NO   | NO    | NO |
| 098     | 01   | A00F32W098         | 1.0             | NO                       | 6.0                | YES  | YES  | NO    | 6.0                  | YES  | YES  | NO    | NO |
| 263     | 01   | A00F32W263         | 1.0             | NO                       | 6.0                | YES  | YES  | NO    | 6.0                  | YES  | YES  | NO    | NO |

A01: STRATA, UNIT, PAYMENT UNIT AND SAMPLE GROUP REPORT (A1)  
PAGE 3

Cancel

## Report Not Available



*Currently, not all reports are available in CruiseProcessing. If a report is requested but is not currently available, no warning is displayed.*

If an unavailable report is necessary to your area, please contact your Regional Measurement Specialist or the Forest Management Service Center in Fort Collins, Colorado, to request the report be included in *CruiseProcessing*. See the contacts list at the beginning of this document. Regional contacts are listed at the end of each release bulletin.



*Once the program has been started, the filename can be changed any number of times. When filenames are changed then the data needs to be processed. Again, if it has not been processed, the program indicates the file must be processed to continue.*

## Add Local Volume

Previous versions of *CruiseProcessing* included the **Local Volume Table** option. This option is now available in this version of the program. It is accessed differently as described below.

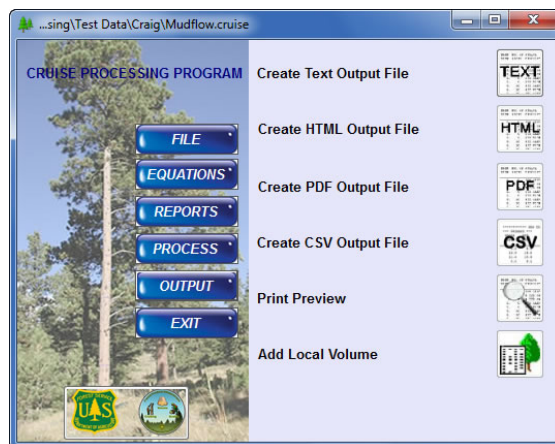
### Introduction

With Tree Measurement sales, some amount of incidental, or add on, volume needs to be determined quickly and easily. One such method would be using a simple local volume table, designed to determine the gross or net volume of a tree from a DBH measurement. Development of such tables can be intimidating, requiring both the knowledge of regression techniques and software to do the analysis.

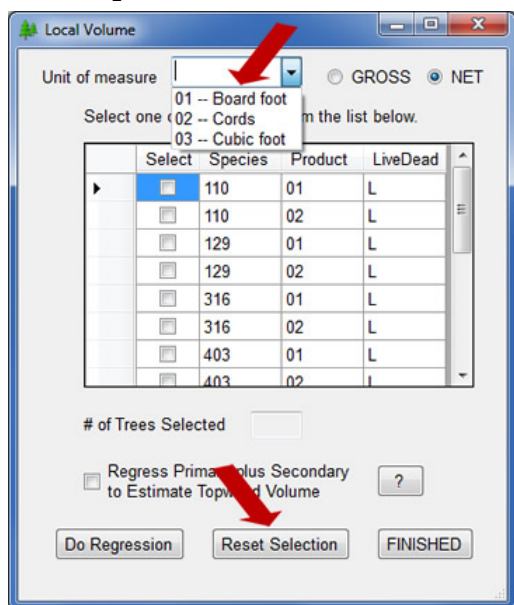
The **Local Volume Table** option was designed to guide the user through the process of creating these local volume tables from the cruise data for the sale. Although no prior experience with regression analysis is necessary to utilize this part of the program, it is recommended the user read **Appendix J: Basic Regression Analysis** at the end of this document before using this option for the first time. The Local Volume Table option requires the cruise data to be processed and the text output file created before the analysis can be completed.

### Getting Started

In the **Output** menu, the last button in the list is **Add Local Volume**. As with the other buttons in this list, the text file must be created before the rest of the buttons are enabled. In many cases, this is because the text output file is used to create other files or, in this case, additional reports are added at the end of the file.



## Select Species Combinations



When **Add Local Volume** button is clicked, the window at left is opened. At the top, unit of measure can be selected from the pulldown list. Then, the associated volume is displayed and the user selects whether gross or net. The default is net volume. Make sure the volume requested has been calculated previously in the program.

The available species/product/livedead combinations from the comparison cruise are shown in the grid. By clicking the checkbox in the **Select** column, the associated combination is used in the regression. Multiple boxes may be checked and all combinations selected are used in the regression. Unselect a group by unchecking the box. A single species group may also be selected rather than multiple groups. As combinations are selected, the **# of Trees Selected** is

updated with the total measured trees available. The groups are sorted by species.

Once the regression for the currently selected group or groups is complete, another selection can be made. The **Reset Selection** button removes all checkmarks from the groups selected and a new set can be created by checking the boxes for the desired groups.

## Regress Topwood if it Exists

To request a local volume table containing topwood or secondary product, click in the box next to **Regress Primary plus Secondary to Estimate Topwood Volume**. Topwood is the amount of volume existing between the primary product minimum top diameter and the secondary product minimum top diameter. Past studies have shown there is no good relationship between the topwood volume and DBH. To create any sort of meaningful regression analysis for topwood, the Local Volume Table option takes the following steps:

1. A regression analysis is completed for the primary product volumes.
2. For each tree, the secondary product volume is combined with the primary product volume.
3. A second regression analysis is done on the combined volume.
4. To create the topwood volume table, the predicted primary product volume is subtracted from the predicted combined volume, leaving the predicted secondary product, which is used to create the topwood volume table.

If there is no topwood, the primary product regression analysis gives the same results as the combined volume regression analysis, which produces zero predicted topwood volumes.

## Regression Analysis

To start a regression analysis based on the selected species group and volume, click the **Do Regression** button. The program produces the results of four regression models defined as follows:

- o Linear Model – Simple linear regression model of the form  $Y = a + bX$ .

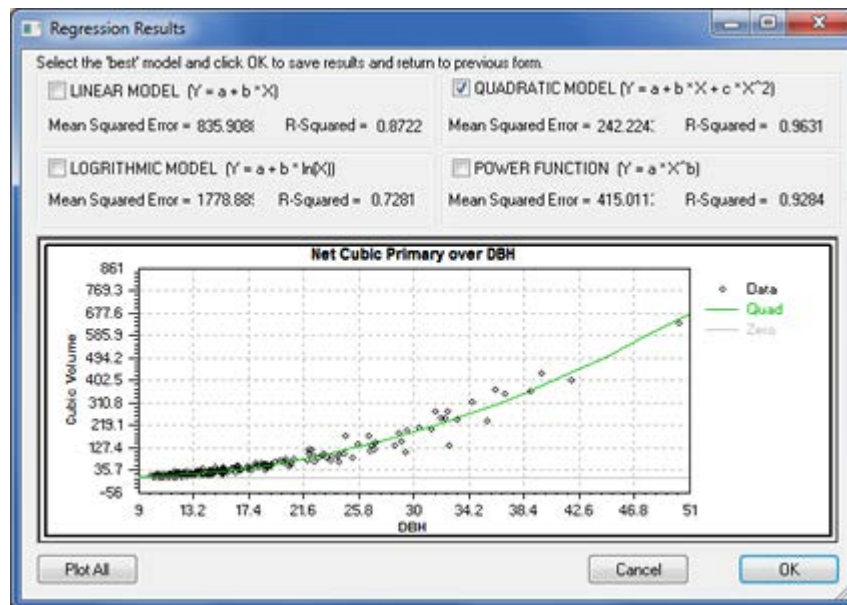
- o Quadratic Model – Multivariate regression model of the form  $Y = a + bX + c(X^2)$ .
- o Log Model – Log linear regression model of the form  $Y = a + b(\ln(X))$  (uses the natural log function).
- o Power Function – Exponential regression model of the form  $Y = aX^b$ .

These four regression models are commonly used regression models and describe a wide variety of shapes and curves. The regression analyses for this program are done utilizing a matrix class library called MatClass developed by C.R. Birchenhall, Dept. of Econometrics and Social Statistics, University of Manchester, UK. The results of several MatClass regression analyses were tested against the results of SAS regression analyses and showed no noticeable differences in the output statistics.

When the four regression analyses are completed, Regression Results are displayed.

### Regression Results

For each of the four regression models, the model description, Mean Squared Error and R-Squared variables are displayed at the top of the **Regression Results** form. The lower part of the form is devoted to a graph of the currently selected regression equation overlaid on top of the data points. The regression analysis producing the lowest Mean Squared Error (MSE) is selected by default.

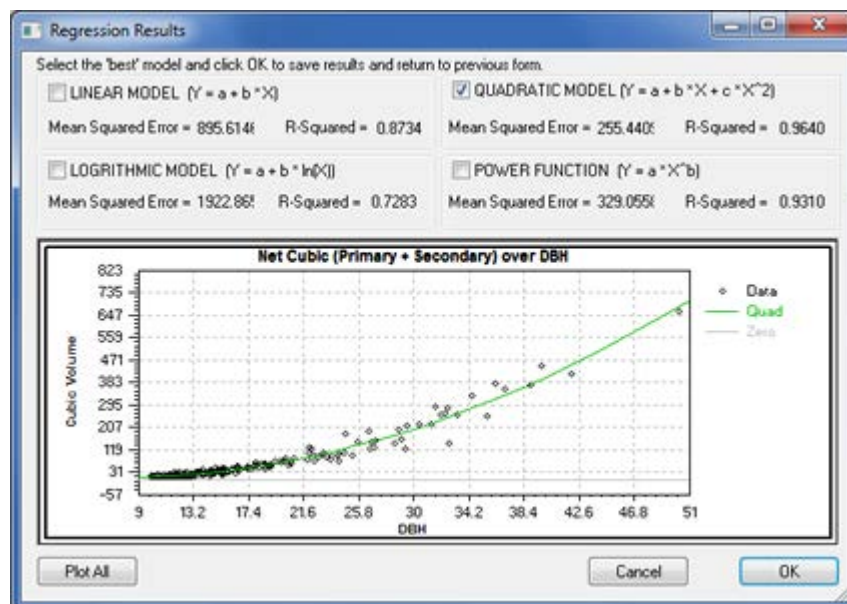


To see the graphs of the other models, select the equation by checking the box to the left of the model. The Plot All button at bottom left overlays all four regression equations for a quick comparison of the equations. If no regression models are selected, only the data is displayed in the graph without a regression line.



**NOTE:** If the Cancel button is clicked, no regression information is captured and saved. When the program tries to append the reports at the bottom of the text output file, a warning message lets the user know this could not be done because of no data.

If the topwood button was selected then another graph is displayed showing the results. This would open when the **OK** button on the first graph is clicked. When **OK** is clicked on this graph, the program returns to the first window where other combinations may be selected and regressed. Notice the title of the graph now reflects **Primary + Secondary**.



### Selecting the Best Model

Now that the regression analysis has been completed on four different models, how is the Best Fit model determined? The **Local Volume Table** option allows the user to evaluate the models using both statistical and visual criteria. The Best Fit model is the model performing the best both statistically and visually. First, let's define those terms.

**Statistical Evaluation** compares the R-Squared and Mean Squared Errors between the given models to find the model giving the best mathematical fit.

**Visual Evaluation** examines the plot of the regression line through the data either one model at a time or through all four models to determine whether the model displays any bias, inconsistencies, or illogical behavior such as predicting negative values.

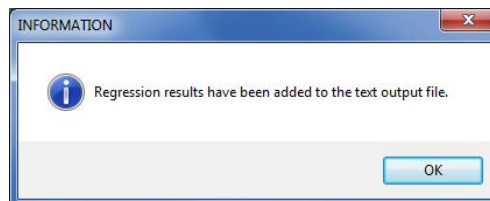
So what constitutes a Best-Fit model? Ideally, it is the model with the highest R-Squared value, with the smallest Mean Squared Error, and has a regression line running cleanly through the middle of the data points. If there are two models with high R-Squared values, small Mean Squared Error and good looking plots, then use smallest Mean Squared Error to make the decision. If the model with the highest R-Squared and smallest MSE shows a bias in the plot (negative volumes at the end of the line) then choose the next highest R-Squared and next smallest MSE combination, provided the plot looks appropriate. Remember, we're looking for the "best-fit" model, not necessarily the one with the highest R-Squared value.

Also, be aware the R-Squared for the “best-fit” model might be less than 0.50. This may be especially true with predicting net volumes. This is acceptable. There is no “magic” R-Squared value to shoot for. Collecting data on more trees will not necessarily increase the R-Squared value. If there is a lot of variability in the data, as is typical with net volumes, great R-Squared values may not be possible. For more information, see **Appendix J**.

Once the Best-Fit equation is identified, check the box next to the equation name and click **OK**. This saves the information for that equation for later reference or use.

## Reports

When the **FINISHED** button is clicked on the first window, the reports are added to the text output file, an information message is displayed, and the windows close.



## Local Volume Tables

LOCAL VOLUME TABLE REPORT - NetCUFT Primary  
 CRUISE #: 88888 SALE #: 88888  
 SALENAME: r8test  
 RUN DATE & TIME: 9/26/2014 2:39:52 PM

|          |         |
|----------|---------|
| Species  | 110/121 |
| Product  | 01      |
| L/D      | L       |
| DBH----- |         |
| 12       | 12.39   |
| 13       | 16.82   |
| 14       | 22.17   |
| 15       | 28.43   |
| 16       | 35.60   |
| 17       | 43.67   |
| 18       | 52.66   |
| 19       | 62.57   |
| 20       | 73.38   |
| 21       | 85.10   |
| 22       | 97.73   |

A table of predicted volume by DBH and species/product/livedead is produced for each volume type regressed. The table only displays predicted volumes for the range of DBHs existing in the cruise data file, plus and minus one inch. For diameters falling outside of the range of cruise diameters, the program prints out dashes. These tables can be used to add additional volume to the sale where the cruise data was collected or can be used as volume estimates in a 3P cruise. All combinations regressed show in the report and may span multiple pages. This example shows only one.

## Regression Results

The regression report displays the results of the regression analysis. For each volume, the report displays the species/produce/livedead group, the model form, sample size, R-squared. Mean Square Error, and the actual equation with coefficients. This information should be maintained to document the volume tables. Up to six combinations may appear in the report. This example shows only one.

LOCAL VOLUME TABLE REPORT - NetCUFT Primary - Regression Results  
 CRUISE #: 88888 SALE #: 88888  
 SALENAME: r8test  
 RUN DATE & TIME: 9/26/2014 2:39:52 PM

|           |         |         |          |           |      |                                              |
|-----------|---------|---------|----------|-----------|------|----------------------------------------------|
| Species   | 110/121 | Product | 01       | Live/Dead | L    |                                              |
| Model     | Number  | RSquare | MS Error | Min       | Max  | Equation                                     |
| Quadratic | 16      | 0.9835  | 8.3768   | 12.2      | 21.1 | 30.208121 + -6.950503*DBH + 0.455449*DBH*DBH |

# Appendices

## **Appendix A**

### **VOLUME EQUATIONS BY REGION**

#### **CRUISE PROCESSING VOLUME EQUATION NUMBERS (to be used after NATCRS ver. 7)**

These are a little confusing but are set up to work Nationwide.

#### **The Logic**

First character is a Geographic Code

I = INGY-Flewelling model\*

F = Westside (R6) Flewelling model\*

1 = Region 1

2 = Region 2

3 = Region 3

4 = Region 4

5 = Region 5

6 = Region 6

8 = Region 8

9 = Region 9

A = Region 10 (Alaska)

H = Hawaii

B = BLM Washington Oregon

M = US Army Corps of Engineers

05 = Proprietary models. Cannot release code in non-executable form.

Second and third character is a Subregional Code based on Forest, Defined Area, Log Length, or some other numerical code.

#### **EXAMPLES**

Region Wide Model

00 = No Subregional Code – Region Wide Application

INGY Subregional Codes (Both Taper and Bark Models)

11 = East Cascade

12 = Okanogan

13 = Blue Mountains

14 = Kootenai

15 = Central Idaho

Region 1 Subregional Code is used to identify model types

01 = Byrne Direct Volume Estimators

02 = Other (Kemp) Direct Volume Estimators

03 = Other (Kemp) Direct Volume Estimators

04 = Other (Kemp) Direct Volume Estimators

05 = Other (Kemp) Direct Volume Estimators

06 = Other (Kemp) Direct Volume Estimators

Region 2 Subregional Codes are based on Forest Number or Estimator Type

03 = Black Hills (Ponderosa pine)

02 = Bighorn (Lodgepole pine)

13 = San Juan (Flewelling model)

12 = Myers volume estimator

10 = Other (?) volume estimator

13 = Other (?) volume estimator for Black Hills

Region 4 Subregional Codes are based on Forest Number when applicable or some numerical code when more than one forest is involved.

01 = Other code  
02 = Other code  
03 = Other code  
05 = Caribou Forest  
07 = Dixie Forest

Region 6 and Region 10 Subregional Codes based on Log Length

16 = Sixteen foot log length  
32 = Thirty two foot log length

Region 8 Subregional codes for profile models are based on R8 Definitions.

The first number is a geographic code and the second is a reference height.

| <u>First Number (Geo. Code)</u> | <u>Second Number (Ref. Ht)</u> |
|---------------------------------|--------------------------------|
| 1_ = Coastal Plain              | _0 = Height to tip             |
| 2_ = Piedmont                   | _4 = Height to a 4 inch dob    |
| 3_ = Appalachian Mtns           | _7 = Height to a 7 inch dob    |
| 4_ = Upper Coastal Plain        | _9 = Height to a 9 inch dob    |
| 5_ = Deep South                 |                                |
| 6_ = Arkansas                   |                                |
| 7_ = Delta / St. Francis        |                                |
| 9_ = Southwide                  |                                |

Region 8 Subregional codes used for the Direct Volume Estimators are by Group Codes (01 – 32)

Fourth, Fifth, Sixth characters defines the model

BEH = Behre's Hyperbola  
CLK = Alexander Clark et.al. profile model  
CZ2 = Czaplewski's 2 point profile model  
CZ3 = Czaplewski's 3 point profile model  
DEM = DeMars Volume Models  
DVE = Direct Volume Estimators (regression models)  
FW2 = Flewelling's 2 point profile model  
FW3 = Flewelling's 3 point profile model  
JB2 = Jim Brickell 2 point profile model  
MAT = Mathis (Rastigi and Loveless profile model)  
SN2 = Sharpnack's 2 point profile model  
WO2 = Wensel and Olsen 2 point profile model

Seventh character defines Western or Eastern U.S

W = Regions 1,2,3,4,5

E = Region 8,9

Exception: Region 6, W/E defines Westside/Eastside of Region 6.

Eighth, Ninth, Tenth character defines species (Forest Survey Hndbk)

Examples

202 = Douglas Fir  
205 = West Coast Douglas Fir R6  
017 = Grand Fir  
122 = Ponderosa Pine  
108 = Lodgepole Pine  
242 = Western Red Cedar  
093 = Engelmann Spruce  
800 = Oak species in general  
802 = White oak  
746 = Quaking Aspen

## **EXAMPLES OF SPECIES AND AREA SPECIFIC PROFILE MODELS**

I00FW2W202 = INGY Douglas Fir 2 Pnt Model

I00FW3W202 = INGY Douglas Fir 3 Pnt Model

I00FW2W017 = INGY Grand fir Flewelling 2 Pnt Model – No Sub Region

I11FW3W017 = INGY Grand fir 2 Pnt Model – Sub Region East Cascade

200CZ2W122 = Region 2 Pond. Pine Czaplewski 2 Pt Model – Region wide

203FW2W122 = Region 2 Pond. Pine Flewelling 2 Pt Model – Black Hills N.F.

407FW2W093 = Region 4 Engelmann Spr Flewelling 2 Pnt Model – Dixie N.F.

407MATW093 = Region 4 Engelmann Spr Mathis Model – Dixie N.F.

500DVEW060 = Region 5 Juniper Direct Volume Estimator – Region wide

500WO2W117 = Region 5 Sugar Pine Wensel & Olsen 2 Pnt Model – Region Wide

616BEHW000 = Region 6 All Species Behre's Hyperbola – 16 foot log lengths

601DVEW015 = Region 6 White Fir Direct Volume Estimator – West Side

839CLKE802 = Region 8 White Oak Clark Profile Model – Appalachian Mtns – 9  
inch dob reference height

809DVEE802 = Region 8 White Oak Direct Volume Estimator – Group Code 9

## REGION 1 – Volume Equations

| <i>Species</i>     | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i> |
|--------------------|-------------|---------------|------------------------|--------------------------|
| Balsam fir         | ABBA        | All           | I00FW2W012             | Flewelling Profile Model |
| Cottonwood         | POIN23      | All           | 102DVEW740             | Kemp Equation            |
| Douglas fir        | PSME        | All           | I00FW2W202             | Flewelling Profile Model |
| Engelmann spruce   | PIEN        | All           | I00FW2W093             | Flewelling Profile Model |
| Grand fir          | ABGR        | All           | I00FW2W017             | Flewelling Profile Model |
| Larch              | LAOC        | All           | I00FW2W073             | Flewelling Profile Model |
| Limber pine        | PIFL2       | All           | I00FW2W073             | Flewelling Profile Model |
| Lodgepole pine     | PICO        | All           | I00FW2W108             | Flewelling Profile Model |
| Mountain hemlock   | TSME        | All           | I00FW2W260             | Flewelling Profile Model |
| Ponderosa pine     | PIPO        | All*          | I00FW2W122             | Flewelling Profile Model |
| Ponderosa pine     | PIPO        | 8             | 203FW2W122             | Flewelling Profile Model |
| Quaking aspen      | POTR5       | All           | 102DVEW746             | Kemp Equation            |
| Subalpine fir      | ABLA        | All           | I00FW2W019             | Flewelling Profile Model |
| Western hemlock    | TSHE        | All           | I00FW2W260             | Flewelling Profile Model |
| Western larch      | LAOC        | All           | I00FW2W073             | Flewelling Profile Model |
| Western redcedar   | THPL        | All           | I00FW2W242             | Flewelling Profile Model |
| Western white pine | PIMO3       | All           | I00FW2W119             | Flewelling Profile Model |
| Whitebark pine     | PIAL        | All           | I00FW2W012             | Flewelling Profile Model |
|                    |             |               |                        |                          |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 2 – Volume Equations

| <i>Species</i>         | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i> |
|------------------------|-------------|---------------|------------------------|--------------------------|
| Bur oak                | QUMA2       | All           | 200DVEW823             | Chojnacky Equation       |
| Douglas fir            | PSME        | All           | 200FW2W202             | Flewelling Profile Model |
| Engelmann spruce       | PIEN        | All           | 407FW2W093             | Flewelling Profile Model |
| Gambel oak             | QUGA        | All           | 200DVEW814             | Chojnacky Equation       |
| Lodgepole pine         | PICO        | All *         | 200FW2W108             | Flewelling Profile Model |
| Lodgepole pine         | PICO        | 2,14          | 202FW2W108             | Flewelling Profile Model |
| Mountain mahogany      | CELEI       | All           | 200DVEW475             | Chojnacky Equation       |
| Oneseed juniper        | JUMO        | All           | 200DVEW069             | Chojnacky Equation       |
| Other hardwoods        |             | All           | 200DVEW998             | Chojnacky Equation       |
| Pinyon pine            | PIED        | All           | 200DVEW106             | Chojnacky Equation       |
| Ponderosa pine         | PIPO        | All *         | 200FW2W122             | Flewelling Profile Model |
| Ponderosa pine         | PIPO        | 3             | 203FW2W122             | Flewelling Profile Model |
| Ponderosa pine         | PIPO        | 13            | 213FW2W122             | Flewelling Profile Model |
| Quaking aspen          | POTR5       | All           | 200FW2W746             | Flewelling Profile Model |
| Rocky Mountain juniper | JUSC2       | All           | 200DVEW066             | Chojnacky Equation       |
| Subalpine fir          | ABLA        | All           | 100FW2W019             | Flewelling Profile Model |
| Utah juniper           | JUOS        | All           | 200DVEW065             | Chojnacky Equation       |
| White fir              | ABCO        | All           | 200FW2W015             | Flewelling Profile Model |
|                        |             |               |                        |                          |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 3 – Volume Equations

| <i>Species</i>   | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i>      |
|------------------|-------------|---------------|------------------------|-------------------------------|
| Black maple      | ACNI5       | All           | 300DVEW314             | Chojnacky Equation            |
| Common juniper   | JUCO6       | All           | 300DVEW060             | Chojnacky Equation            |
| Douglas fir      | PSME        | All *         | 301DVEW202             | Hann and Bare Equation        |
| Douglas fir      | PSME        | 2             | 302DVEW202             | Hann and Bare Equation Carson |
| Douglas fir      | PSME        | 3             | 302DVEW202             | Hann and Bare Equation Cibola |
| Douglas fir      | PSME        | 7             | 302DVEW202             | Hann and Bare Equation Kaibab |
| Douglas fir      | PSME        | 10            | 301FW2W202             | Flewelling Profile Model      |
| Engelmann spruce | PIEN        | All           | 300DVEW093             | Hann and Bare Equation        |
| Limber pine      | PIFL2       | All           | 300DVEW113             | Hann and Bare Equation        |
| Maple            | ACER        | All           | 300DVEW310             | Chojnacky Equation            |
| Oak              | QUESPP      | All           | 300DVEW800             | Chojnacky Equation            |
| Other species    |             | All           | 300DVEW999             | Chojnacky Equation            |
| Ponderosa pine   | PIPO        | All *         | 300DVEW122             | Eager Mill Study              |
| Ponderosa pine   | PIPO        | 1,4,7, 12     | 300FW2W122             | Flewelling Profile Model      |
| Ponderosa pine   | PIPO        | 10            | 301FW2W122             | Flewelling Profile Model      |
| Quaking aspen    | POTR5       | All           | 300DVEW746             | Hann and Bare Equation        |
| Twoneedle pinyon | PIED        | All           | 300DVEW106             | Chojnacky Equation            |
| White fir        | ABCO        | All *         | 301DVEW015             | Hann and Bare Equation        |
| White fir        | ABCO        | 2             | 302DVEW015             | Hann and Bare Equation Carson |
| White fir        | ABCO        | 3             | 302DVEW015             | Hann and Bare Equation Cibola |
| White fir        | ABCO        | 7             | 302DVEW015             | Hann and Bare Equation Kaibab |
| White fir        | ABCO        | 10            | 301FW2W015             | Flewelling Profile Model      |
| White pine       | PIST3       | 10            | 301FW2W108             | Flewelling Profile Model      |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 4 – Volume Equations

| <i>Species</i>                | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i>               |
|-------------------------------|-------------|---------------|------------------------|----------------------------------------|
| Blue spruce                   | PIPU        | All*          | 400MATW093             | Rustagi Profile Model                  |
| Blue spruce                   | PIPU        | 2,12,13       | I15FW2W093             | Flewelling Profile Model               |
| Blue spruce                   | PIPU        | 7             | 407FW2W093             | Flewelling Profile Model               |
| Blue spruce                   | PIPU        | 8             | 407MATW093             | Rustagi Profile Model                  |
| California red fir            | ABMA        | 9,17          | 400MATW020             | Rustagi Profile Model                  |
| Douglas fir                   | PSME        | All *         | 400MATW202             | Rustagi Profile Model                  |
| Douglas fir                   | PSME        | 2,12,13       | I15FW2W202             | Flewelling Profile Model               |
| Douglas fir                   | PSME        | 5             | 405MATW202             | Rustagi Profile Model Caribou          |
| Engelmann spruce              | PIEN        | All *         | 400MATW093             | Rustagi Profile Model                  |
| Engelmann spruce              | PIEN        | 2,12,13       | I15FW2W093             | Flewelling Profile Model Central Idaho |
| Engelmann spruce              | PIEN        | 7             | 407FW2W093             | Flewelling Profile Model Dixie         |
| Engelmann spruce              | PIEN        | 8             | 407MATW093             | Rustagi Profile Model                  |
| Grand fir                     | ABGR        | All *         | 400MATW015             | Rustagi Profile Model                  |
| Grand fir                     | ABGR        | 2,12,13       | I15FW2W017             | Flewelling Profile Model Central Idaho |
| Incense cedar                 | CADE27      | 9,17          | 400MATW081             | Rustagi Profile Model                  |
| Limber pine                   | PIFL2       | All*          | 400MATW108             | Rustagi Profile Model                  |
| Limber pine                   | PIFL2       | 9,17          | 401MATW108             | Rustagi Profile Model                  |
| Lodgepole pine                | PICO        | All *         | 400MATW108             | Rustagi Profile Model                  |
| Lodgepole pine                | PICO        | 9,17          | 401MATW108             | Rustagi Profile Model Humboldt         |
| Mountain hemlock              | TSME        | 9,17          | 401MATW015             | Rustagi Profile Model                  |
| Mountain mahogany             | CERCO       | All           | 400DVEW475             | Chojnacky equation                     |
| Other hardwoods               |             | All           | 400DVEW998             | Chojnacky equation                     |
| Pinyon pine                   | PIED        | All           | 400DVEW106             | Chojnacky equation                     |
| Ponderosa pine                | PIPO        | All *         | 400MATW122             | Rustagi Profile Model                  |
| Ponderosa pine                | PIPO        | 1             | 401MATW122             | Rustagi Profile Model Ashley           |
| Ponderosa pine                | PIPO        | 2,12,13       | I15FW2W122             | Flewelling Profile Model Central Idaho |
| Ponderosa pine                | PIPO        | 7,8,10,18,19  | 402MATW122             | Rustagi Profile Model Dixie            |
| Ponderosa pine                | PIPO        | 9,17          | 403MATW122             | Rustagi Profile Model Humboldt         |
| Quaking aspen                 | POTR5       | All           | 400MATW746             | Rustagi Profile Model                  |
| Rocky Mountain juniper        | JUSC2       | All           | 400DVEW066             | Chojnacky equation                     |
| Single leaf pinyon pine       | PIMO        | All           | 400DVEW133             | Chojnacky equation                     |
| Subalpine fir                 | ABLA        | All *         | 400MATW019             | Rustagi Profile Model                  |
| Subalpine fir                 | ABLA        | 5             | 405MATW019             | Rustagi Profile Model Caribou          |
| Sugar pine                    | PILA        | 9,17          | 400MATW117             | Rustagi Profile Model                  |
| Utah juniper-Great Basin      | JUOS        | All           | 400DVEW065             | Chojnacky equation                     |
| Utah juniper-Colorado Plateau | JUOS        | All           | 401DVEW065             | Chojnacky equation                     |
| Western juniper               | JUOC        | All           | 400DVEW064             | Chojnacky equation                     |
| Western larch                 | LAOC        | 2,6,12,13,14  | 400MATW073             | Rustagi Profile Model                  |
| Western white pine            | PIMO3       | 9,17          | 400MATW117             | Rustagi Profile Model                  |
| White fir                     | ABCO        | All *         | 400MATW015             | Rustagi Profile Model                  |

| <i>Species</i> | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i>               |
|----------------|-------------|---------------|------------------------|----------------------------------------|
| Blue spruce    | PIPU        | All*          | 400MATW093             | Rustagi Profile Model                  |
| White fir      | ABCO        | 2,12,13       | I15FW2W017             | Flewelling Profile Model Central Idaho |
| White fir      | ABCO        | 9,17          | 401MATW015             | Rustagi Profile Model Humboldt         |
| Whitebark pine | PIAL        | All*          | 400MATW108             | Rustagi Profile Model                  |
| Whitebark pine | PIAL        | 9,17          | 401MATW108             | Rustagi Profile Model                  |
|                |             |               |                        |                                        |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 5 – Volume Equations

| <i>Species</i>       | <i>Code</i> | <i>Forest</i>      | <i>Equation Number</i> | <i>Model Description</i>                   |
|----------------------|-------------|--------------------|------------------------|--------------------------------------------|
| Bigleaf maple        | ACMA3       | All                | 500DVEW312             | Pillsbury and Kirkley Regression Equation  |
| Blue oak             | QUDO        | All                | 500DVEW807             | Pillsbury and Kirkley Regression Equation  |
| California black oak | QUKE        | All                | 500DVEW818             | Pillsbury and Kirkley Regression Equation  |
| California laurel    | UMCA        | All                | 500DVEW981             | Pillsbury and Kirkley Regression Equation  |
| California live oak  | QUAG        | All                | 500DVEW801             | Pillsbury and Kirkley Regression Equation  |
| California red fir   | ABMA        | All                | 500WO2W020             | Wensel and Olsen Profile Model             |
| California red fir   | ABMA        | 5, 6, 8, 9, 10, 14 | 532WO2W020             | Wensel and Olsen Profile Model-Scribner 32 |
| California white oak | QULO        | All                | 500DVEW821             | Pillsbury and Kirkley Regression Equation  |
| Canyon live oak      | QUCH2       | All                | 500DVEW805             | Pillsbury and Kirkley Regression Equation  |
| Common juniper       | JUCO6       | All                | 500DVEW060             | Pillsbury and Kirkley Regression Equation  |
| Douglas fir          | PSME        | All                | 500WO2W202             | Wensel and Olsen Profile Model             |
| Douglas fir          | PSME        | 5, 6, 8, 9, 10, 14 | 532WO2W202             | Wensel and Olsen Profile Model-Scribner 32 |
| Engelmann's oak      | QUEN        | All                | 500DVEW811             | Pillsbury and Kirkley Regression Equation  |
| Engelmann spruce     | PIEN        | All                | 500WO2W015             | Wensel and Olsen Profile Model             |
| Giant sequoia        | SEGI2       | All                | 500DVEW212             | Pillsbury and Kirkley Regression Equation  |
| Golden chinkapin     | CAPU9       | All                | 500DVEW431             | Pillsbury and Kirkley Regression Equation  |
| Grand fir            | ABGR        | All                | 115FW2W017             | Flewelling-Central Idaho Model             |
| Incense cedar        | CADE27      | All                | 500WO2W081             | Wensel and Olsen Profile Model             |
| Incense cedar        | CADE27      | 5, 6, 8, 9, 10, 14 | 532WO2W081             | Wensel and Olsen Profile Model-Scribner 32 |
| Interior live oak    | QUWI2       | All                | 500DVEW839             | Pillsbury and Kirkley Regression Equation  |
| Jeffrey pine         | PIJE        | All                | 500WO2W116             | Wensel and Olsen Profile Model             |
| Jeffrey pine         | PIJE        | 5, 6, 8, 9, 10, 14 | 532WO2W116             | Wensel and Olsen Profile Model-Scribner 32 |
| Lodgepole pine       | PICO        | All                | 500WO2W108             | Wensel and Olsen Profile Model             |
| Lodgepole pine       | PICO        | 5, 6, 8, 9, 10, 14 | 532WO2W108             | Wensel and Olsen Profile Model-Scribner 32 |
| Mountain hemlock     | TSME        | All                | 500WO2W015             | Wensel and Olsen Profile Model             |
| Oregon white oak     | QUGA4       | All                | 500DVEW815             | Pillsbury and Kirkley Regression Equation  |
| Pacific madrone      | ARME        | All                | 500DVEW361             | Pillsbury and Kirkley Regression Equation  |
| Ponderosa pine       | PIPO        | All                | 500WO2W122             | Wensel and Olsen Profile Model             |
| Ponderosa pine       | PIPO        | 5, 6, 8, 9, 10, 14 | 532WO2W122             | Wensel and Olsen Profile Model-Scribner 32 |
| Red alder            | ALRU2       | All                | 500DVEW351             | Pillsbury and Kirkley Regression Equation  |
| Redwood              | SESE3       | All                | 500WO2W211             | Wensel and Olsen Profile Model             |
| Redwood              | SESE3       | 5, 6, 8, 9, 10, 14 | 532WO2W211             | Wensel and Olsen Profile Model-Scribner 32 |
| Sugar pine           | ABGR        | All                | 500WO2W117             | Wensel and Olsen Profile Model             |
| Sugar pine           | ABGR        | 5, 6, 8, 9, 10, 14 | 532WO2W117             | Wensel and Olsen Profile Model-Scribner 32 |
| Tanoak               | LIDE3       | All                | 500DVEW631             | Pillsbury and Kirkley Regression Equation  |
| Western white pine   | PIMO3       | All                | 500WO2W117             | Wensel and Olsen Profile Model             |
| White fir            | ABCO        | All                | 500WO2W015             | Wensel and Olsen Profile Model             |
| White fir            | ABCO        | 5, 6, 8, 9, 10, 14 | 532WO2W015             | Wensel and Olsen Profile Model-Scribner 32 |
|                      |             |                    |                        |                                            |

## HAWAII VOLUME EQUATIONS.

| <i>Species</i>      | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i> |
|---------------------|-------------|---------------|------------------------|--------------------------|
| Koa                 | ACBE        | All           | 616BEHW000             | Behre's Hyperbola        |
| Ohia                | HYRE        | All           | H00SN2W671             | Sharpnack Equations      |
| Robustus Eucalyptus | EUTO11      | All           | H00SN2W510             | Sharpnack Equations      |
| Saligna Eucalyptus  | EUTO11      | All           | H01SN2W510             | Sharpnack Equations      |
|                     |             |               |                        |                          |

All = Equation good for all Forest or Districts.

**All\* = All Forests or Districts except for the following rows with defined Forest or District numbers**

## REGION 6 – Volume Equations

| <i>Species</i> | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i> |
|----------------|-------------|---------------|------------------------|--------------------------|
| All coniferous |             | All           | 616BEHW000             | Behre's Hyperbola        |
|                |             |               |                        |                          |
|                |             |               |                        |                          |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

**For further information on stem profile volume equation numbers, please contact the Region 6 Measurements Specialist.**

## REGION 7 (BLM) Total Tree Height or Height in 16 Foot Logs

| <i>Species</i>        | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i> |
|-----------------------|-------------|---------------|------------------------|--------------------------|
| Douglas fir/Cascade   | PSME        | ALL           | B01BEHW202             | Behre's Hyperbola        |
| Douglas fir/Coast     | PSME        | ALL           | B02BEHW202             | Behre's Hyperbola        |
| Douglas fir/Southwest | PSME        | ALL           | B03BEHW202             | Behre's Hyperbola        |
| Redwood               | SESE3       | ALL           | B00BEHW211             | Behre's Hyperbola        |
| Pond. pine/Yellow     | PIPO        | ALL           | B00BEHW122             | Behre's Hyperbola        |
| Jeffery pine          | PIJE        | ALL           | B00BEHW116             | Behre's Hyperbola        |
| Sugar pine            | PILA        | ALL           | B00BEHW117             | Behre's Hyperbola        |
| Western white pine    | PIMO3       | ALL           | B00BEHW119             | Behre's Hyperbola        |
| Lodgepole pine        | PICO        | ALL           | B00BEHW108             | Behre's Hyperbola        |
| Pacific yew           | TABR2       | ALL           | B00BEHW231             | Behre's Hyperbola        |
| Tan oak               | LIDE3       | ALL           | B00BEHW631             | Behre's Hyperbola        |
| Red alder             | ALRU2       | ALL           | B00BEHW351             | Behre's Hyperbola        |
| Oregon myrtle         |             | ALL           | B00BEHW998             | Behre's Hyperbola        |
| Big leaf maple        | ACMA3       | ALL           | B00BEHW312             | Behre's Hyperbola        |
| Pacific madrone       | ARME        | ALL           | B00BEHW361             | Behre's Hyperbola        |
| Golden chinquapin     | CHCHC4      | ALL           | B00BEHW431             | Behre's Hyperbola        |
| Oregon ash            | FRLA        | ALL           | B00BEHW542             | Behre's Hyperbola        |
| Black cottonwood      | POBAT       | ALL           | B00BEHW747             | Behre's Hyperbola        |
| Oak species           | QUESPP      | ALL           | B00BEHW800             | Behre's Hyperbola        |
| White fir/Westside    | ABCO        | ALL           | B00BEHW015             | Behre's Hyperbola        |
| Shasta red fir        | ABSH        | ALL           | B00BEHW021             | Behre's Hyperbola        |
| Grand fir             | ABGR        | ALL           | B00BEHW017             | Behre's Hyperbola        |
| Pacific. silver fir   | ABAM        | ALL           | B00BEHW011             | Behre's Hyperbola        |
| Noble fir             | ABPR        | ALL           | B00BEHW022             | Behre's Hyperbola        |
| Engelmann spruce      | PIEN        | ALL           | B00BEHW093             | Behre's Hyperbola        |
| Sitka spruce          | PISI        | ALL           | B00BEHW098             | Behre's Hyperbola        |
| Hemlock               | TSHE        | ALL           | B00BEHW260             | Behre's Hyperbola        |
| Incense cedar         | CADE27      | ALL           | B00BEHW081             | Behre's Hyperbola        |
| Alaska cedar          | CHNO        | ALL           | B00BEHW042             | Behre's Hyperbola        |
| Port Orford cedar     | CHLA        | ALL           | B00BEHW041             | Behre's Hyperbola        |
| Western red cedar     | THPL        | ALL           | B00BEHW242             | Behre's Hyperbola        |
| Western larch         | LAOC        | ALL           | B00BEHW073             | Behre's Hyperbola        |
| Misc. species         | UNLSPP      | ALL           | B00BEHW999             | Behre's Hyperbola        |
|                       |             |               |                        |                          |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 7 (BLM) Total Tree Height or Height in 32 foot Logs

| <i>Species</i>        | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i> |
|-----------------------|-------------|---------------|------------------------|--------------------------|
| Douglas fir/Cascade   | PSME        | ALL           | B01B32W202             | Behre's Hyperbola        |
| Douglas fir/Coast     | PSME        | ALL           | B02B32W202             | Behre's Hyperbola        |
| Douglas fir/Southwest | PSME        | ALL           | B03B32W202             | Behre's Hyperbola        |
| Redwood               | SESE3       | ALL           | B00B32W211             | Behre's Hyperbola        |
| Pond. pine/Yellow     | PIPO        | ALL           | B00B32W122             | Behre's Hyperbola        |
| Jeffery pine          | PIJE        | ALL           | B00B32W116             | Behre's Hyperbola        |
| Sugar pine            | PILA        | ALL           | B00B32W117             | Behre's Hyperbola        |
| Western white pine    | PIMO3       | ALL           | B00B32W119             | Behre's Hyperbola        |
| Lodgepole pine        | PICO        | ALL           | B00B32W108             | Behre's Hyperbola        |
| Pacific yew           | TABR2       | ALL           | B00B32W231             | Behre's Hyperbola        |
| Tan oak               | LIDE3       | ALL           | B00B32W631             | Behre's Hyperbola        |
| Red alder             | ALRU2       | ALL           | B00B32W351             | Behre's Hyperbola        |
| Oregon myrtle         |             | ALL           | B00B32W998             | Behre's Hyperbola        |
| Big leaf maple        | ACMA3       | ALL           | B00B32W312             | Behre's Hyperbola        |
| Pacific madrone       | ARME        | ALL           | B00B32W361             | Behre's Hyperbola        |
| Golden chinquapin     | CHCHC4      | ALL           | B00B32W431             | Behre's Hyperbola        |
| Oregon ash            | FRLA        | ALL           | B00B32W542             | Behre's Hyperbola        |
| Black cottonwood      | POBAT       | ALL           | B00B32W747             | Behre's Hyperbola        |
| Oak species           | QUESPP      | ALL           | B00B32W800             | Behre's Hyperbola        |
| White fir/Westside    | ABCO        | ALL           | B00B32W015             | Behre's Hyperbola        |
| Shasta red fir        | ABSH        | ALL           | B00B32W021             | Behre's Hyperbola        |
| Grand fir             | ABGR        | ALL           | B00B32W017             | Behre's Hyperbola        |
| Pacific. silver fir   | ABAM        | ALL           | B00B32W011             | Behre's Hyperbola        |
| Noble fir             | ABPR        | ALL           | B00B32W022             | Behre's Hyperbola        |
| Engelmann spruce      | PIEN        | ALL           | B00B32W093             | Behre's Hyperbola        |
| Sitka spruce          | PISI        | ALL           | B00B32W098             | Behre's Hyperbola        |
| Hemlock               | TSHE        | ALL           | B00B32W260             | Behre's Hyperbola        |
| Incense cedar         | CADE27      | ALL           | B00B32W081             | Behre's Hyperbola        |
| Alaska cedar          | CHNO        | ALL           | B00B32W042             | Behre's Hyperbola        |
| Port Orford cedar     | CHLA        | ALL           | B00B32W041             | Behre's Hyperbola        |
| Western red cedar     | THPL        | ALL           | B00B32W242             | Behre's Hyperbola        |
| Western larch         | LAOC        | ALL           | B00B32W073             | Behre's Hyperbola        |
| Misc. species         | UNLSPP      | ALL           | B00B32W999             | Behre's Hyperbola        |
|                       |             |               |                        |                          |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 8 – Board Foot Volume Equations

| <i>Species</i> | <i>Code</i> | <i>Forest</i> | <i>District</i>      | <i>Equation Number</i> | <i>Model Description</i> |
|----------------|-------------|---------------|----------------------|------------------------|--------------------------|
| All            |             | All           | All                  | 825DVEE***             | Lasher Equations – Bdft  |
| All            |             | 3             | 1,2,3,4,5,6,7        | 801DVEE***             | Lasher Equations – Bdft  |
| All            |             | 4             | 1,2,3,4,5,6          | 801DVEE***             | Lasher Equations – Bdft  |
| All            |             | 11            | 2,4,5,6,7,8,9,11     | 801DVEE***             | Lasher Equations – Bdft  |
| All            |             | 12            | 2                    | 801DVEE***             | Lasher Equations – Bdft  |
| All            |             | 6             | 1,2,3,4,5            | 802DVEE***             | Lasher Equations – Bdft  |
| All            |             | 5             | 1,2,4,5,6            | 803DVEE***             | Lasher Equations – Bdft  |
| All            |             | 10            | 1,2,3,4,5,6          | 804DVEE***             | Lasher Equations – Bdft  |
| All            |             | 10            | 7                    | 805DVEE***             | Lasher Equations – Bdft  |
| All            |             | 1             | 8                    | 806DVEE***             | Lasher Equations – Bdft  |
| All            |             | 11            | 3                    | 807DVEE***             | Lasher Equations – Bdft  |
| All            |             | 11            | 10                   | 808DVEE***             | Lasher Equations – Bdft  |
| All            |             | 6             | 6                    | 809DVEE***             | Lasher Equations – Bdft  |
| All            |             | 2             | 11,12,13,14,15,16,17 | 810DVEE***             | Lasher Equations – Bdft  |
| All            |             | 8             | 1,2,3,4,5,6          | 811DVEE***             | Lasher Equations – Bdft  |
| All            |             | 14            | 1,2,3,4,5,6          | 812DVEE***             | Lasher Equations – Bdft  |
| All            |             | 1             | 1                    | 813DVEE***             | Lasher Equations – Bdft  |
| All            |             | 1             | 5,6                  | 814DVEE***             | Lasher Equations – Bdft  |
| All            |             | 1             | 3                    | 815DVEE***             | Lasher Equations – Bdft  |
| All            |             | 1             | 4                    | 816DVEE***             | Lasher Equations – Bdft  |
| All            |             | 1             | 7                    | 817DVEE***             | Lasher Equations – Bdft  |
| All            |             | 7             | 6                    | 818DVEE***             | Lasher Equations – Bdft  |
| All            |             | 7             | 1,10                 | 819DVEE***             | Lasher Equations – Bdft  |
| All            |             | 7             | 2,3                  | 820DVEE***             | Lasher Equations – Bdft  |
| All            |             | 7             | 4,8                  | 821DVEE***             | Lasher Equations – Bdft  |
| All            |             | 7             | 5                    | 822DVEE***             | Lasher Equations – Bdft  |
| All            |             | 7             | 7,17                 | 823DVEE***             | Lasher Equations – Bdft  |
| All            |             | 12            | 1,3,7,8              | 824DVEE***             | Lasher Equations – Bdft  |
| All            |             | 12            | 5,6                  | 825DVEE***             | Lasher Equations – Bdft  |
| All            |             | 13            | 1                    | 826DVEE***             | Lasher Equations – Bdft  |
| All            |             | 13            | 3,6                  | 827DVEE***             | Lasher Equations – Bdft  |
| All            |             | 13            | 5,7                  | 828DVEE***             | Lasher Equations – Bdft  |
| All            |             | 13            | 2,4                  | 829DVEE***             | Lasher Equations – Bdft  |
| All            |             | 9             | 1,6                  | 830DVEE***             | Lasher Equations – Bdft  |
| All            |             | 9             | 2,3,4,5,7,8,9,10,11  | 831DVEE***             | Lasher Equations – Bdft  |
| All            |             | 9             | 12                   | 832DVEE***             | Lasher Equations – Bdft  |

<sup>1</sup> Replace \*\*\* with three digit FSH code.

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## Region 8 – Cubic Foot Volume Equations

| <i>Species</i>       | <i>Code</i> | <i>Forest</i> | <i>District</i> | <i>Height Type</i> | <i>Equation Number</i> | <i>Model Description</i> |
|----------------------|-------------|---------------|-----------------|--------------------|------------------------|--------------------------|
| Multiple             |             | 1             | All             | Total              | 840CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 1             | All             | 4 inch top         | 844CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 1             | All             | 7 inch top         | 847CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 1             | All             | 9 inch top         | 849CLKE***             | Clark Profile Model      |
| Multiple             |             | 1             | 3               | Total              | 810CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 1             | 3               | 4 inch top         | 814CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 1             | 3               | 7 inch top         | 817CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 1             | 3               | 9 inch top         | 819CLKE***             | Clark Profile Model      |
| Multiple             |             | 2,3,4,8,11    | All             | Total              | 830CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 2,3,4,8,11    | All             | 4 inch top         | 834CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 2,3,4,8,11    | All             | 7 inch top         | 837CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 2,3,4,8,11    | All             | 9 inch top         | 839CLKE***             | Clark Profile Model      |
| Multiple             |             | 3             | 8               | Total              | 820CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 3             | 8               | 4 inch top         | 824CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 3             | 8               | 7 inch top         | 827CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 3             | 8               | 9 inch top         | 829CLKE***             | Clark Profile Model      |
| Multiple             |             | 5             | All             | Total              | 810CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 5             | All             | 4 inch top         | 814CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 5             | All             | 7 inch top         | 817CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 5             | All             | 9 inch top         | 819CLKE***             | Clark Profile Model      |
| Multiple             |             | 6,7,13        | All             | Total              | 850CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 6,7,13        | All             | 4 inch top         | 854CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 6,7,13        | All             | 7 inch top         | 857CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 6,7,13        | All             | 9 inch top         | 859CLKE***             | Clark Profile Model      |
| Multiple             |             | 7             | 6               | Total              | 870CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 7             | 6               | 4 inch top         | 874CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 7             | 6               | 7 inch top         | 877CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 7             | 6               | 9 inch top         | 879CLKE***             | Clark Profile Model      |
| Multiple             |             | 7             | 7,17            | Total              | 840CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 7             | 7,17            | 4 inch top         | 844CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 7             | 7,17            | 7 inch top         | 847CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 7             | 7,17            | 9 inch top         | 849CLKE***             | Clark Profile Model      |
| Multiple             |             | 9,10          | All             | Total              | 860CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 9,10          | All             | 4 inch top         | 864CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 9,10          | All             | 7 inch top         | 867CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 9,10          | All             | 9 inch top         | 869CLKE***             | Clark Profile Model      |
| Multiple             |             | 10            | 3               | Total              | 810CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 10            | 3               | 4 inch top         | 814CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 10            | 3               | 7 inch top         | 817CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 10            | 3               | 9 inch top         | 819CLKE***             | Clark Profile Model      |
| Multiple             |             | 10            | 10              | Total              | 820CLKE***             | Clark Profile Model      |

| <i>Species</i>       | <i>Code</i> | <i>Forest</i> | <i>District</i> | <i>Height Type</i> | <i>Equation Number</i> | <i>Model Description</i> |
|----------------------|-------------|---------------|-----------------|--------------------|------------------------|--------------------------|
| Multiple             |             | 1             | All             | Total              | 840CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 10            | 10              | 4 inch top         | 824CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 10            | 10              | 7 inch top         | 827CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 10            | 10              | 9 inch top         | 829CLKE***             | Clark Profile Model      |
| Multiple             |             | 12            | All             | Total              | 820CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 12            | All             | 4 inch top         | 824CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 12            | All             | 7 inch top         | 827CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 12            | All             | 9 inch top         | 829CLKE***             | Clark Profile Model      |
| Multiple             |             | 12            | 2               | Total              | 830CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 12            | 2               | 4 inch top         | 834CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 12            | 2               | 7 inch top         | 837CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 12            | 2               | 9 inch top         | 839CLKE***             | Clark Profile Model      |
| Multiple             |             | 12            | 5               | Total              | 810CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | 12            | 5               | 4 inch top         | 814CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | 12            | 5               | 7 inch top         | 817CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | 12            | 5               | 9 inch top         | 819CLKE***             | Clark Profile Model      |
| Multiple             |             | All           | All             | Total              | 890CLKE***             | Clark Profile Model      |
| Multiple, Pulpwood   |             | All           | All             | 4 inch top         | 894CLKE***             | Clark Profile Model      |
| Softwoods, Sawtimber |             | All           | All             | 7 inch top         | 897CLKE***             | Clark Profile Model      |
| Hardwoods, Sawtimber |             | All           | All             | 9 inch top         | 899CLKE***             | Clark Profile Model      |

<sup>2</sup> Replace \*\*\* with three digit FSH code.

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 8 Species List for Volume Equation Numbers

### Hardwood Species

| <i>Species Name</i> | <i>Species Code</i> | <i>Species Name</i> | <i>Species Code</i> | <i>Species Name</i>   | <i>Species Code</i> |
|---------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|
| American sycamore   | 731                 | Green ash           | 544                 | Soft Hardwoods/Acacia | 300                 |
| Basswood            | 950                 | Hackberry           | 460                 | Sourwood              | 711                 |
| Beech               | 531                 | Hard hardwoods      | 500                 | Southern magnolia     | 652                 |
| Birch               | 370                 | Hickory             | 400                 | Southern red oak      | 812                 |
| Black cherry        | 762                 | Honeylocust         | 550                 | Sugar maple           | 318                 |
| Black locust        | 901                 | Laurel oak          | 820                 | Swamp chestnut oak    | 825                 |
| Black maple         | 314                 | Magnolia            | 650                 | Swamp tupelo          | 694                 |
| Black oak           | 837                 | Northern red oak    | 833                 | Swamp white oak       | 804                 |
| Black tupelo        | 693                 | Nuttall oak         | 828                 | Sweetbay              | 653                 |
| Black walnut        | 602                 | Oak                 | 800                 | Sweetgum              | 611                 |
| Blue ash            | 546                 | Overcup oak         | 822                 | Water oak             | 827                 |
| Boxelder            | 313                 | Pecan               | 404                 | Water tupelo          | 691                 |
| Buckeye             | 330                 | Pin oak             | 830                 | White ash             | 541                 |
| Bur oak             | 823                 | Post oak            | 835                 | White oak             | 802                 |
| Butternut           | 601                 | Pumpkin ash         | 545                 | Willow                | 920                 |
| Cherrybark oak      | 813                 | Red maple           | 316                 | Willow oak            | 831                 |
| Chestnut oak        | 832                 | Sassafras           | 930                 | Yellow poplar         | 621                 |
| Chinkapin oak       | 826                 | Scarlet oak         | 806                 |                       |                     |
| Common persimmon    | 521                 | Shingle oak         | 817                 |                       |                     |
| Cucumbertree        | 651                 | Shumard oak         | 834                 |                       |                     |
| Eastern cottonwood  | 742                 | Silver maple        | 317                 |                       |                     |
| Elm                 | 970                 | Silverbell          | 580                 |                       |                     |

### Softwood Species

| <i>Species Name</i> | <i>Species Code</i> |
|---------------------|---------------------|
| Baldcypress         | 221                 |
| Eastern hemlock     | 261                 |
| Eastern redcedar    | 268                 |
| Eastern white pine  | 129                 |
| Loblolly pine       | 131                 |
| Longleaf pine       | 121                 |
| Pine                | 100                 |
| Pitch pine          | 126                 |
| Pond pine           | 128                 |
| Pondcypress         | 222                 |
| Sand pine           | 107                 |
| Shortleaf pine      | 110                 |
| Slash pine          | 111                 |
| Spruce              | 197                 |
| Spruce pine         | 115                 |
| Table mountain pine | 123                 |
| Virginia pine       | 132                 |

## REGION 9 – Volume Equations

| <i>Species</i> | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i>    |
|----------------|-------------|---------------|------------------------|-----------------------------|
| All            |             | ALL           | 900DVEE***             | Gevorkiantz Volume Equation |
| All            |             | ALL           | 900CLKE***             | Clark Volume Equations      |
| All            |             | ALL           | 925DVEE***             | Hahn Volume Equations*      |

<sup>3</sup> Replace \*\*\* with three digit species code.

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

\*-- Not normally used for timber sales.

## REGION 9 Species List for Volume Equation Numbers

### Hardwood Species

| <i>Species Name</i>   | <i>Species Code</i> | <i>Species Name</i>  | <i>Species Code</i> | <i>Species Name</i>     | <i>Species Code</i> |
|-----------------------|---------------------|----------------------|---------------------|-------------------------|---------------------|
| American basswood     | 951                 | Dogwood spp.         | 490                 | Rock elm                | 977                 |
| American beech        | 531                 | Eastern cottonwood   | 742                 | Sassafras               | 931                 |
| American chestnut     | 421                 | Eastern redbud       | 471                 | Scarlet oak             | 806                 |
| American elm          | 972                 | Elm spp.             | 970                 | Serviceberry            | 356                 |
| American mountain ash | 935                 | Flowering dogwood    | 491                 | Shagbark hickory        | 407                 |
| American sycamore     | 731                 | Gray birch           | 379                 | Shellbark hickory       | 405                 |
| Balsam poplar         | 741                 | Green ash            | 544                 | Shingle oak             | 817                 |
| Bear oak              | 816                 | Hackberry spp.       | 460                 | Shumard oak             | 834                 |
| Bigleaf magnolia      | 654                 | Hickory spp.         | 400                 | Silver maple            | 317                 |
| Bigtooth aspen        | 743                 | Honeylocust          | 552                 | Slippery elm            | 975                 |
| Bitternut hickory     | 402                 | Ironwood/Hophornbeam | 701                 | Sourwood                | 711                 |
| Black ash             | 543                 | Kentucky coffeetree  | 571                 | Southern red oak        | 812                 |
| Black cherry          | 762                 | Kentucky yellowwood  | 481                 | Striped maple           | 315                 |
| Black hickory         | 408                 | Mockernut hickory    | 409                 | Sugar maple             | 318                 |
| Black locust          | 901                 | Mountain magnolia    | 655                 | Swamp chestnut oak      | 825                 |
| Black maple           | 314                 | Mountain maple       | 319                 | Swamp cottonwood        | 744                 |
| Black oak             | 837                 | Northern catalpa     | 452                 | Swamp tupelo            | 694                 |
| Black walnut          | 602                 | Northern pin oak     | 809                 | Swamp white oak         | 804                 |
| Black willow          | 922                 | Northern red oak     | 833                 | Sweet birch             | 372                 |
| Blackgum              | 694                 | Oak spp.             | 800                 | Sweetgum                | 611                 |
| Blackjack oak         | 824                 | Ohio buckeye         | 331                 | Water tupelo            | 691                 |
| Blue-beech/Hornbeam   | 391                 | Osage orange         | 641                 | White ash               | 541                 |
| Boxelder              | 313                 | Overcup oak          | 822                 | White basswood          | 952                 |
| Buckeye spp.          | 330                 | Paper birch          | 375                 | White oak               | 802                 |
| Bur oak               | 823                 | Pecan                | 404                 | Willow oak              | 831                 |
| Butternut             | 601                 | Pignut hickory       | 403                 | Willow spp.             | 920                 |
| Cherrybark oak        | 813                 | Pin cherry           | 761                 | Winged elm              | 971                 |
| Chestnut oak          | 832                 | Pin oak              | 830                 | Yellow birch            | 371                 |
| Chinkapin oak         | 826                 | Post oak             | 835                 | Yellow buckeye          | 332                 |
| Common hackberry      | 462                 | Quaking aspen        | 746                 | Yellow-poplar/Tuliptree | 621                 |
| Common persimmon      | 521                 | Red maple            | 316                 |                         |                     |
| Cucumbertree          | 651                 | River birch          | 373                 |                         |                     |

**REGION 9 Species List for Volume Equation Numbers -- continued**

**Softwood Species**

| <i>Species Name</i>  | <i>Species Code</i> |
|----------------------|---------------------|
| Australian pine      | 136                 |
| Baldcypress          | 221                 |
| Balsam fir           | 012                 |
| Black spruce         | 095                 |
| Eastern hemlock      | 261                 |
| Eastern redcedar     | 068                 |
| Eastern white pine   | 129                 |
| Engelmann spruce     | 093                 |
| Jack pine            | 105                 |
| Loblolly pine        | 131                 |
| Northern white-cedar | 241                 |
| Norway spruce        | 091                 |
| Pitch pine           | 126                 |
| Red pine             | 125                 |
| Red spruce           | 097                 |
| Scotch pine          | 130                 |
| Shortleaf pine       | 110                 |
| Table Mountain pine  | 123                 |
| Tamarack             | 071                 |
| Virginia pine        | 132                 |
| White spruce         | 094                 |

## REGION 10 – Volume Equations

| <i>Species</i>                | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i>                       |
|-------------------------------|-------------|---------------|------------------------|------------------------------------------------|
| Alaska yellow cedar           | CHNO        | 5             | A00F32W042             | Flewelling Profile Model<br>(32 foot log rule) |
| Black spruce                  | PIMA        | 4             | A00DVEW094             | Larson Volume Equation                         |
| Cottonwood                    | POBAT       | 4             | A00DVEW747             | Larson Volume Equation                         |
| Mountain hemlock              | TSHE        | 4             | A01DEMW263             | Demars Profile Model                           |
| Paper birch                   | BEPAP       | 4             | A00DVEW375             | Larson Volume Equation                         |
| Quaking aspen                 | POTR5       | 4             | A00DVEW746             | Larson Volume Equation                         |
| Red alder                     | ALRU2       | All           | A32CURW351             | Curtis Profile Model - 32 foot logs            |
| Sitka spruce                  | PISI        | All           | A00F32W098             | Flewelling Profile Model<br>(32 foot log rule) |
| Sitka spruce-second growth    | PISI        | 5             | A02F32W098             | Flewelling Profile-32ft Log Rule               |
| Western hemlock               | TSHE        | All           | A00F32W263             | Flewelling Profile Model<br>(32 foot log rule) |
| Western hemlock-second growth | TSHE        | 5             | A02F32W263             | Flewelling Profile-32ft Log Rule               |
| Western redcedar              | THPL        | 5             | A00F32W242             | Flewelling Profile Model<br>(32 foot log rule) |
| White spruce                  | PIGL        | 4             | A00DVEW094             | Larson Volume Equation                         |
|                               |             |               |                        |                                                |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## REGION 11 – DEPARTMENT OF DEFENSE – Volume Equations

| <i>Species</i>   | <i>Code</i> | <i>Forest</i> | <i>Equation Number</i> | <i>Model Description</i>         |
|------------------|-------------|---------------|------------------------|----------------------------------|
| Douglas fir      | PSME        | All           | F00FW2W202             | Flewelling Profile Model         |
| Douglas fir      | PSME        | All           | F02FW2W202             | Flewelling Profile Model         |
| Douglas fir      | PSME        | All           | F07FW2W202             | Flewelling Profile Model         |
| Douglas fir      | PSME        | All           | F00F32W202             | Flewelling Profile-32ft Log Rule |
| Douglas fir      | PSME        | All           | F02F32W202             | Flewelling Profile-32ft Log Rule |
| Douglas fir      | PSME        | All           | F07F32W202             | Flewelling Profile-32ft Log Rule |
| Western hemlock  | TSHE        | All           | F00FW2W263             | Flewelling Profile Model         |
| Western hemlock  | TSHE        | All           | F02FW2W263             | Flewelling Profile Model         |
| Western hemlock  | TSHE        | All           | F07FW2W263             | Flewelling Profile Model         |
| Western hemlock  | TSHE        | All           | F00F32W263             | Flewelling Profile-32ft Log Rule |
| Western hemlock  | TSHE        | All           | F02F32W263             | Flewelling Profile-32ft Log Rule |
| Western hemlock  | TSHE        | All           | F07F32W263             | Flewelling Profile-32ft Log Rule |
| Western redcedar | THPL        | All           | F00FW2W242             | Flewelling Profile Model         |
| Western redcedar | THPL        | All           | F02FW2W242             | Flewelling Profile Model         |
| Western redcedar | THPL        | All           | F07FW2W242             | Flewelling Profile Model         |
| Western redcedar | THPL        | All           | F00F32W242             | Flewelling Profile-32ft Log Rule |
| Western redcedar | THPL        | All           | F02F32W242             | Flewelling Profile-32ft Log Rule |
| Western redcedar | THPL        | All           | F07F32W242             | Flewelling Profile-32ft Log Rule |
| Other Species    |             | All           | 616BEHW000             | Behre's Hyperbola                |
| Other Species    |             | All           | 628BEHW000             | Behre's Hyperbola                |
|                  |             |               |                        |                                  |

All = Equation good for all Forest or Districts.

All\* = All Forests or Districts except for the following rows with defined Forest or District numbers.

## INGY

Flewelling  
2 point

Douglas Fir  
Western Larch  
Grand Fir  
Ponderosa pine  
Lodgepole pine  
Western red cedar  
Mountain Hemlock  
White Pine  
Engelmann spruce  
Alpine Fir  
Balsam fir

### Equation #

I00FW2W202  
I00FW2W073  
I00FW2W017  
I00FW2W122  
I00FW2W108  
I00FW2W242  
I00FW2W260  
I00FW2W119  
I00FW2W093  
I00FW2W019  
I00FW2W012

### Subregional Codes

(replace 1<sup>st</sup> 3 letters)

I00 = Area Wide  
I11 = East Cascade  
I12 = Okanogan  
I13 = Blue Mountains  
I14 = Kootenai  
I15 = Central Idaho  
I21 = Canada Fiz D  
I22 = Canada Fiz E  
I23 = Canada Fiz F

Flewelling  
3 point

Douglas Fir  
Western Larch  
Grand Fir  
Ponderosa pine  
Lodgepole pine  
Western red cedar  
Mountain Hemlock  
White Pine  
Engelmann spruce  
Alpine Fir  
Balsam fir

I00FW3W204  
I00FW3W073  
I00FW3W017  
I00FW3W122  
I00FW3W108  
I00FW3W242  
I00FW3W260  
I00FW3W119  
I00FW3W093  
I00FW3W019  
I00FW3W012

## WESTSIDE

Flewelling  
2 point

Douglas Fir  
Western red cedar  
Western Hemlock

### Equation #

F00FW2W202  
F00FW2W242  
F00FW2W263

### Subregional Codes

(replace first 3 letters)

F00 = Area wide  
F01 = CO Oregon Coast  
F02 = EV Oregon East Valley  
F03 = NO Washington North  
F04 = RS Washington Rain

Shadow

F05 = SO Washington South  
F06 = WE Washington West  
F07 = WV Oregon West Valley  
F08 = WC Washington Coast

Flewelling  
3 point

Douglas Fir  
Western red cedar  
Western Hemlock

### Equation #

F00FW3W202  
F00FW3W242  
F00FW3W263

## MERCHANDIZING RULES APPLIED TO PROFILE MODELS BY REGION

### *Region 1:*

Scribner Decimal C

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 8 feet

Minimum log length for topwood logs is 8 feet

Segmentation logic:

Logs are divided into 16 foot logs. If the top log is greater than 2 feet and less than 16 feet, it is added to the previous log and split into two nearly equal even lengths. (ie: A 16 and an 8 foot log become two 12 foot logs).

A 6 inch trim allowance will be accounted for when determining number of logs in a tree.

If no stump height is recorded, it defaults to a one foot stump.

If no minimum merchantable top diameter is recorded, 5.6 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 4.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

### *Region 2:*

Scribner Decimal C

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 8 feet

Minimum log length for topwood logs is 2 feet

Segmentation logic:

Logs are divided into 16 foot logs. If the top log is greater than 2 feet and less than 16 feet, it is added to the previous log and split into two nearly equal even lengths. (ie: A 16 and an 8 foot log become two 12 foot logs)

A 6 inch trim allowance is accounted for when determining number of logs in a tree.

If no stump height is recorded, it defaults to a one foot stump.

If no minimum merchantable top diameter is recorded, 6.0 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 4.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

### *Region 3:*

No profile models in use.

### *Region 4:*

Scribner Decimal C

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 8 feet

Minimum log length for topwood logs is 2 feet

Segmentation logic:

Logs are divided into 16 foot logs. If the top log is greater than 2 feet and less than 16 feet, it is added to the previous log and split into two nearly equal even lengths. (ie: A 16 and an 8 foot log become two 12 foot logs).

A 6 inch trim allowance is accounted for when determining number of logs in a tree.

If no stump height is recorded, it defaults to a one foot stump.

If no minimum merchantable top diameter is recorded, 6.0 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 4.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

#### *Region 5:*

Scribner Decimal C

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 8 feet

Minimum log length for topwood logs is 2 feet

Segmentation logic:

Logs are divided into 16 foot logs. If the top log is greater than 2 feet and less than 16 feet, it is added to the previous log and split into two nearly equal even lengths. (ie: A 16 and an 8 foot log become two 12 foot logs).

A 6 inch trim allowance is accounted for when determining number of logs in a tree.

If no stump height is recorded, it defaults to a one foot stump.

If no minimum merchantable top diameter is recorded, 6.0 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 4.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

#### *Region 6:*

Scribner factor volume reported to nearest board foot.

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 2 feet

Minimum log length for topwood logs is 2 feet

Segmentation logic:

Logs are divided into 16 foot logs with the top log standing on its own. (ie: A 16 and an 8 foot log stay 16 and 8 foot logs).

A 6 inch trim allowance is accounted for when determining number of logs in a tree.

If no stump height is recorded, no stump height is accounted for.

If no minimum merchantable top diameter is recorded, 2.0 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 2.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

To calculate board foot volumes for 32 foot logs, the first two logs are added together, the volume computed using the small end diameter for the top log using the total log length, and the volume is prorated back to the two logs. The next two logs are added together and so on up the tree.

#### *Region 8:*

No external merchandizing rules applied to their profile models.

*Region 9:*

No profile models in use.

*Region 10:*

Scribner Decimal C

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 8 feet

Minimum log length for topwood logs is 8 feet

Segmentation logic:

Logs are divided into 16 foot logs with the top log standing on its own. (ie: A 16 and an 8 foot log stay 16 and 8 foot logs).

A 6 inch trim allowance is accounted for when determining number of logs in a tree.

If no stump height is recorded, a 1.0 stump height is used.

If no minimum merchantable top diameter is recorded, 6.0 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 4.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

To calculate board foot volumes for 32 foot logs, the first two logs are added together, the volume computed using the small end diameter for the top log using the total log length, and the volume is prorated back to the two logs. The next two logs are added together and so on up the tree.

*BLM – Washington and Oregon:*

Scribner factor volume reported to nearest board foot.

Only even log lengths

Maximum log length is 16 feet

Minimum log length is 2 feet

Minimum log length for topwood logs is 2 feet

Segmentation logic:

Logs are divided into 16 foot logs with the top log standing on its own. (ie: A 16 and an 8 foot log stay 16 and 8 foot logs).

A 6 inch trim allowance is accounted for when determining number of logs in a tree.

If no stump height is recorded, a 1.0 stump height is used.

If no minimum merchantable top diameter is recorded, 5.0 inches is used.

If no minimum merchantable top diameter for topwood is recorded, 2.0 inches is used.

At least one 8 foot log must be present for the tree to be considered merchantable.

To calculate board foot volumes for 32 foot logs, the first two logs are added together, the volume computed using the small end diameter for the top log using the total log length, and the volume is prorated back to the two logs. The next two logs are added together and so on up the tree.

## Appendix B

### Value Equations

#### VALUE EQUATIONS

**NOTE:** All dollar values for BDFT are entered as dollars per thousand. All dollar values for CUFT are entered as dollars per hundred. Cord wood values are dollars per cord.

| <b>REGION 1</b> |                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------|
| <b>EQUATION</b> | <b>Description</b>                                                                              |
| VLPP0101        | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0102        | \$(1) times Net BDFT primary product volume                                                     |
| VLPP0103        | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0104        | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0106        | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0107        | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0110        | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0112        | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| <b>REGION 2</b> |                                                                                                 |
| <b>EQUATION</b> | <b>Description</b>                                                                              |
| VLPP0201        | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0202        | \$(1) times Net BDFT primary product volume                                                     |
| VLPP0203        | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0204        | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0206        | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0207        | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0210        | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0212        | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| <b>REGION 3</b> |                                                                                                 |
| <b>EQUATION</b> | <b>Description</b>                                                                              |
| VLPP0301        | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0302        | \$(1) times Net BDFT primary product volume                                                     |
| VLPP0303        | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0304        | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0306        | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0307        | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0310        | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0312        | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| <b>REGION 4</b> |                                                                                                 |
| <b>EQUATION</b> | <b>Description</b>                                                                              |
| VLPP0401        | Mature PP live                                                                                  |
| VLPP0402        | Mature PP dead                                                                                  |
| VLPP0403        | Immature PP live                                                                                |
| VLPP0404        | Immature PP dead                                                                                |
| <b>REGION 5</b> |                                                                                                 |
| <b>EQUATION</b> | <b>Description</b>                                                                              |
| VLPP0501        | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0502        | \$(1) times Net BDFT primary product volume                                                     |

|                                                                                                                                                                          |                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| VLPP0503                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0504                                                                                                                                                                 | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0506                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0507                                                                                                                                                                 | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0510                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0512                                                                                                                                                                 | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| <b>REGION 6</b>                                                                                                                                                          |                                                                                                 |
| Contact R6 Forest Products for information.                                                                                                                              |                                                                                                 |
| <b>REGION 7 (BLM)</b>                                                                                                                                                    |                                                                                                 |
| Value equation numbers are similar to the following: VLPP0701, VLPP0702, VLPP0703, etc. The value is the sum of value for the logs. The equation uses five coefficients. |                                                                                                 |
| <b>REGION 8</b>                                                                                                                                                          |                                                                                                 |
| <b>EQUATION</b>                                                                                                                                                          | <b>Description</b>                                                                              |
| VLPP0801                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0802                                                                                                                                                                 | \$(1) times Net BDFT primary product volume                                                     |
| VLPP0803                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0804                                                                                                                                                                 | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0806                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0807                                                                                                                                                                 | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0810                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0812                                                                                                                                                                 | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| <b>REGION 9</b>                                                                                                                                                          |                                                                                                 |
| <b>EQUATION</b>                                                                                                                                                          | <b>Description</b>                                                                              |
| VLPP0901                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0902                                                                                                                                                                 | \$(1) times Net BDFT primary product volume                                                     |
| VLPP0903                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0904                                                                                                                                                                 | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0905                                                                                                                                                                 | \$(1) times Cord Wood primary product volume                                                    |
| VLPP0906                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0907                                                                                                                                                                 | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0908                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume + \$(2) times Cord Wood secondary product volume  |
| VLPP0909                                                                                                                                                                 | \$(1) times Net BDFT primary product volume + \$(1) times Cord Wood secondary product volume    |
| VLPP0910                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0911                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume + \$(2) times Cord Wood secondary product volume  |
| VLPP0912                                                                                                                                                                 | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0913                                                                                                                                                                 | \$(1) times Net CUFT primary product volume + \$(2) times Cord Wood secondary product volume    |
| VLPP0914                                                                                                                                                                 | \$(1) times Cord Wood primary product volume + \$(2) times Cord Wood secondary product volume   |
| <b>REGION 10</b>                                                                                                                                                         |                                                                                                 |
| <b>EQUATION</b>                                                                                                                                                          | <b>Description</b>                                                                              |
| VLPP0001                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume                                                   |
| VLPP0002                                                                                                                                                                 | \$(1) times Net BDFT primary product volume                                                     |
| VLPP0003                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume                                                   |
| VLPP0004                                                                                                                                                                 | \$(1) times Net CUFT primary product volume                                                     |
| VLPP0006                                                                                                                                                                 | \$(1) times Gross BDFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0007                                                                                                                                                                 | \$(1) times Net BDFT primary product volume + \$(2) times Net CUFT secondary product volume     |
| VLPP0010                                                                                                                                                                 | \$(1) times Gross CUFT primary product volume + \$(2) times Gross CUFT secondary product volume |
| VLPP0012                                                                                                                                                                 | \$(1) times Net CUFT primary product volume + \$(2) times Net CUFT secondary product volume     |

**NOTE:** Value coefficients are region dependent. Contact your Regional Measurement Specialist for the values in your area.

## ***Appendix C***

### **VALID CODES FOR CERTAIN FIELDS**

#### **CRUISE METHOD CODES**

|        |                                            |
|--------|--------------------------------------------|
| 100    | Classic 100%                               |
| 3P     | Classic 3P                                 |
| 3PFIX  | 3P Fixed Biomass (not currently available) |
| 3PPNT  | 3P Point Biomass                           |
| FIX    | Fixed Plot                                 |
| F3P    | Fixed Plot with 3P subsample               |
| PNT    | Point (Variable Plot)                      |
| P3P    | Point with 3P subsample                    |
| STR    | Sample Tree                                |
| S3P    | Sample Tree with 3P subsample              |
| PCM    | Point Count/Measure Tree                   |
| FCM    | Fixed Count/Measure                        |
| FIXCNT | Fixed Count                                |

#### **LOGGING METHOD CODES**

|     |                                          |
|-----|------------------------------------------|
| 401 | Manual logging                           |
| 410 | Animal                                   |
| 420 | Tractor                                  |
| 421 | Rubber tired skidder                     |
| 422 | Hard track (track driven from rear)      |
| 423 | Soft track (track driven from front)     |
| 430 | Single span skyline\                     |
| 431 | Single span gravity outhaul lt 1300 ft.  |
| 432 | Single span haulback outhaul lt 1300 ft. |
| 433 | Single span gravity outhaul lt 1800 ft.  |
| 434 | Single span haulback outhaul lt 1800 ft. |
| 435 | Single span skyline gt 1800 ft.          |
| 440 | Multispan                                |
| 441 | Multispan - uphill                       |
| 442 | Multispan - downhill                     |
| 450 | Highlead                                 |
| 451 | Grabinski                                |
| 452 | Track loader/jammer                      |
| 453 | Loader logging                           |
| 454 | Other logging                            |
| 460 | Colddeck and swing                       |
| 461 | Highlead colddeck/skyline swing          |
| 462 | Highlead colddeck/highlead swing         |
| 464 | Other colddeck                           |

- 470 Balloon
- 480 Helicopter
- 481 Helicopter - small
- 482 Helicopter - medium
- 483 Helicopter - large
- 490 Utilizer - chip
- 491 Mechanized systems (felling/bucking/delimbing)
- 492 Cut to length

### **PRODUCT CODES**

- 01 Sawtimber
- 02 Pulpwood
- 03 Poles
- 04 Pilings
- 05 Mine Props
- 06 Posts
- 07 Fuelwood
- 08 Non-sawtimber
- 09 Ties
- 10 Coop Bolts
- 11 Acid/Dist.
- 12 Float Logs
- 13 Trap Float
- 14 Misc-Conv.
- 15 Christmas Trees
- 16 Nav Stores
- 17 Non Conv.
- 18 Cull Logs
- 19 Sm Rnd Wd
- 20 Grn Bio Cv
- 21 Dry Bio Cv
- 26 Sp Wood Pr

### **UNIT OF MEASURE CODES**

- 01 Board feet
- 02 Cords
- 03 Cubic feet
- 04 Piece count
- 05 Weight

## Appendix D

### REPORTS AVAILABLE FROM THE CRUISE PROCESSING PROGRAM

A summary of report groupings and the type of information displayed is as follows:

| <u>Report</u>   |                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Grouping</u> | <u>Type of Information Displayed</u>                                                                                                                           |
| A               | Raw data and tree level information                                                                                                                            |
| BLM             | BLM reports                                                                                                                                                    |
| CSV             | Comma-delimited text files for select reports                                                                                                                  |
| EX              | Variable Log Length (Export Grade) reports                                                                                                                     |
| GR              | Graphs                                                                                                                                                         |
| L               | Log level reports                                                                                                                                              |
| LD              | Live/dead Summary reports                                                                                                                                      |
| LV              | Leave tree reports                                                                                                                                             |
| R               | Regional requested reports – Reports are coded for the region represented.<br>Example: R101-R199 for Region 1 reports and R301-R399 for Region 3 reports, etc. |
| SC              | Stem Count reports (FIXCNT Method only)                                                                                                                        |
| ST              | Statistic reports for sample populations & strata/sale                                                                                                         |
| TC              | Stand tables – cut trees only – 1” and 2” diameter class                                                                                                       |
| TL              | Stand tables – leave trees only – 1” and 2” diameter class                                                                                                     |
| TIM             | SUM file for Timber Information Manager                                                                                                                        |
| UC              | Unit level reports                                                                                                                                             |
| VSM             | Volume Summary reports                                                                                                                                         |
| VPA             | Volume Per Acre Summary reports                                                                                                                                |
| VAL             | Dollar value reports                                                                                                                                           |
| WT              | Weight reports                                                                                                                                                 |

Listed below are the report names and a brief description of the contents. Examples of some of the reports are shown after the list. Reports available in the current version of *CruiseProcessing* are noted with a check mark. Some reports have been slightly modified for the new program and are noted with an asterisk.

With the addition of the FIXCNT method and the use of unit-of-measure code 04 (piece count), statistics are now shown for this UOM in the ST reports. While the column heading reads “VOLUME”, the UOM actually drives what value is used in this column. Here’s a breakdown of how UOM works in these reports for this column.

| UOM | VOLUME contains                                             |
|-----|-------------------------------------------------------------|
| 01  | BDFT volume (gross or net depending on the report selected) |
| 02  | Cord volume                                                 |
| 03  | CUFT volume (gross or net depending on the report selected) |
| 04  | Piece count (no gross or net)                               |
| 05  | CUFT volume (gross or net depending on the report selected) |

### *New Report Numbers*

For new report numbers, the older report number is listed in the description.

| <b>A REPORTS -- Listing of Raw Data and Individual Tree Information</b> |                                                                                                                                                                                                                                                                                                                      |                  |                 |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| <i>Report</i>                                                           | <i>Description</i>                                                                                                                                                                                                                                                                                                   | <i>Available</i> | <i>Modified</i> |
| A01                                                                     | Listing of strata, cutting unit, payment unit and sample group information. (A1)                                                                                                                                                                                                                                     | ✓                |                 |
| A02                                                                     | Listing of plot information (A1)                                                                                                                                                                                                                                                                                     | ✓                |                 |
| A03                                                                     | Listing of individual tree measurements and characteristics. (A2)                                                                                                                                                                                                                                                    | ✓                |                 |
| A04                                                                     | Listing of count table information. (A2)                                                                                                                                                                                                                                                                             | ✓                |                 |
| A05                                                                     | Listing of primary and secondary product gross and net cubic foot volume information for each tree and per acre/per strata. (A5)                                                                                                                                                                                     | ✓                |                 |
| A06                                                                     | Listing of primary and secondary product \$ value for each tree and per acre/per strata. (A6)                                                                                                                                                                                                                        | ✓                |                 |
| A07                                                                     | Listing of primary and secondary product gross and net board foot for each tree and per acre/per strata. (A7)                                                                                                                                                                                                        | ✓                |                 |
| A08                                                                     | Listing of log grade information. (A3)                                                                                                                                                                                                                                                                               | ✓                |                 |
| A09                                                                     | Listing of log detail information for Fall, Buck and Scale. (A4)                                                                                                                                                                                                                                                     |                  |                 |
| A10                                                                     | Listing of calculated biomass weights by component: primary, secondary, foliage, live branches, dead branches, and total tree. Values are displayed as green pounds. Expansion factors are included in the report. (A9)                                                                                              | ✓                |                 |
| A11                                                                     | Net BDFT volume and estimated number of trees by tree grade (A12)                                                                                                                                                                                                                                                    | ✓                |                 |
| A12                                                                     | Net CUFT volume and estimated number of trees by tree grade (A13)                                                                                                                                                                                                                                                    | ✓                |                 |
| A13                                                                     | Listing of Geospatial Information – one or more pages list the X, Y and Z coordinates and Metadata for the plot table. One or more pages are also generated for each measured tree in the tree table and include the X, Y and Z coordinates as well as the Metadata. (A14)                                           | ✓                |                 |
| A14                                                                     | Summary of Species Based on Unit Level Data – grouped into three sections, this report shows average BA per acre, estimated number of trees, or number of sample trees depending on method. The groups are area-based methods, tree-based methods tallied by species and tree-based methods tallied by sample group. | ✓                |                 |
| A15                                                                     | Merchandizing Rules for Current Sale – shows volume                                                                                                                                                                                                                                                                  | ✓                |                 |

|  |                                                                                                                                                                                            |  |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  | equation, product, trim, minimum log length primary product, maximum log length secondary, segmentation logic, minimum merch length, even/odd segment, and whether it was modified or not. |  |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## REPORT A01

The A01 report consists of four sections, one each for Stratum, Cutting Unit, Payment Unit and Sample Group information. These examples show a portion of each section.

| A01: STRATA, UNIT, PAYMENT UNIT AND SAMPLE GROUP REPORT (A1) |            |               |              |       |           |              |                    |       |        |
|--------------------------------------------------------------|------------|---------------|--------------|-------|-----------|--------------|--------------------|-------|--------|
| CRUISE#: 20002 SALE#: 20002                                  |            |               |              |       |           |              |                    |       |        |
| SALENAME: R2 Test                                            |            |               |              |       |           |              |                    |       |        |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM                      |            |               |              |       |           |              |                    |       |        |
| PAGE 4                                                       |            |               |              |       |           |              |                    |       |        |
| VERSION: DRAFT.2013                                          |            |               |              |       |           |              |                    |       |        |
| VOLUME LIBRARY VERSION: 09.23.2013                           |            |               |              |       |           |              |                    |       |        |
| CRUISE NO.                                                   | STRATA NO. | CRUISE METHOD | STRATA ACRES | BAF   | PLOT SIZE | NO. OF PLOTS | STRATA DESCRIPTION | DATE  | MMYYYY |
| 20002                                                        | 1          | 100           | 18.00        | 0.00  | 0         | 0            | 100                | 72009 |        |
| 20002                                                        | 10         | PCM           | 18.00        | 20.00 | 0         | 7            | PCM                | 72009 |        |
| 20002                                                        | 11         | PCM           | 18.00        | 0.00  | 5         | 10           | PCM                | 72009 |        |
| 20002                                                        | 2          | 3P            | 18.00        | 0.00  | 0         | 0            | 3P                 | 72009 |        |
| 20002                                                        | 3          | 3PPNT         | 50.00        | 20.00 | 0         | 18           | 3PPNT              | 72009 |        |
| 20002                                                        | 4          | FIX           | 18.00        | 0.00  | 5         | 12           | FIX                | 72009 |        |
| 20002                                                        | 5          | F3P           | 18.00        | 0.00  | 5         | 10           | F3P                | 72009 |        |
| 20002                                                        | 6          | PNT           | 18.00        | 20.00 | 0         | 13           | PNT                | 72009 |        |
| 20002                                                        | 7          | P3P           | 18.00        | 20.00 | 0         | 12           | P3P                | 72009 |        |
| 20002                                                        | 8          | STR           | 18.00        | 0.00  | 0         | 0            | STR                | 72009 |        |
| 20002                                                        | 9          | S3P           | 18.00        | 0.00  | 0         | 0            | S3P                | 72009 |        |

| A01: STRATA, UNIT, PAYMENT UNIT AND SAMPLE GROUP REPORT (A1) |                  |                    |                          |            |                  | PAGE 3                             |
|--------------------------------------------------------------|------------------|--------------------|--------------------------|------------|------------------|------------------------------------|
| CRUISE#: 20002 SALE#: 20002                                  |                  |                    |                          |            |                  |                                    |
| SALENAME: R2 Test                                            |                  |                    |                          |            |                  | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM                      |                  |                    |                          |            |                  | VOLUME LIBRARY VERSION: 09.23.2013 |
| CRUISE NO.                                                   | CUTTING UNIT NO. | CUTTING UNIT ACRES | CUTTING UNIT DESCRIPTION | LOG METHOD | PAYMENT UNIT NO. |                                    |
| 20002                                                        | 1                | 18.00              |                          | 421        | 1                |                                    |
| 20002                                                        | 10               | 18.00              |                          | 421        | 10               |                                    |
| 20002                                                        | 11               | 18.00              |                          | 421        | 11               |                                    |
| 20002                                                        | 2                | 18.00              |                          | 421        | 2                |                                    |
| 20002                                                        | 3                | 50.00              |                          | 421        | 3                |                                    |
| 20002                                                        | 4                | 18.00              |                          | 421        | 4                |                                    |
| 20002                                                        | 5                | 18.00              |                          | 421        | 5                |                                    |
| 20002                                                        | 6                | 18.00              |                          | 451        | 6                |                                    |
| 20002                                                        | 7                | 18.00              |                          | 420        | 7                |                                    |
| 20002                                                        | 8                | 18.00              |                          | 492        | 8                |                                    |
| 20002                                                        | 9                | 18.00              |                          | 421        | 9                |                                    |
| TOTAL SALE ACRES:                                            |                  | 230.00             |                          |            |                  |                                    |

| A01: STRATA, UNIT, PAYMENT UNIT AND SAMPLE GROUP REPORT (A1) |              |         |              |  |  |  |  |  |  |
|--------------------------------------------------------------|--------------|---------|--------------|--|--|--|--|--|--|
| CRUISE#: 20002 SALE#: 20002                                  |              |         |              |  |  |  |  |  |  |
| SALENAME: R2 Test                                            |              |         |              |  |  |  |  |  |  |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM                      |              |         |              |  |  |  |  |  |  |
| PAGE 5                                                       |              |         |              |  |  |  |  |  |  |
| VERSION: DRAFT.2013                                          |              |         |              |  |  |  |  |  |  |
| VOLUME LIBRARY VERSION: 09.23.2013                           |              |         |              |  |  |  |  |  |  |
| CRUISE NO.                                                   | CUTTING UNIT | STRATUM | PAYMENT UNIT |  |  |  |  |  |  |
| 20002                                                        | 1            | 1       | 1            |  |  |  |  |  |  |
| 20002                                                        | 10           | 10      | 10           |  |  |  |  |  |  |
| 20002                                                        | 11           | 11      | 11           |  |  |  |  |  |  |
| 20002                                                        | 2            | 2       | 2            |  |  |  |  |  |  |
| 20002                                                        | 3            | 3       | 3            |  |  |  |  |  |  |
| 20002                                                        | 4            | 4       | 4            |  |  |  |  |  |  |
| 20002                                                        | 5            | 5       | 5            |  |  |  |  |  |  |
| 20002                                                        | 6            | 6       | 6            |  |  |  |  |  |  |
| 20002                                                        | 7            | 7       | 7            |  |  |  |  |  |  |
| 20002                                                        | 8            | 8       | 8            |  |  |  |  |  |  |
| 20002                                                        | 9            | 9       | 9            |  |  |  |  |  |  |

## REPORT A01 continued

| A01: STRATA, UNIT, PAYMENT UNIT AND SAMPLE GROUP REPORT (A1) |              |             | PAGE 6                             |
|--------------------------------------------------------------|--------------|-------------|------------------------------------|
| CRUISE#: 20002 SALE#: 20002                                  |              |             | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                                            |              |             | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM                      |              |             |                                    |
| STRATUM                                                      | SAMPLE GROUP | DESCRIPTION |                                    |
| 1                                                            |              |             |                                    |
| 2                                                            | E            | E           |                                    |
| 2                                                            | P            | P           |                                    |
| 2                                                            | L            | L           |                                    |
| 3                                                            |              |             |                                    |
| 4                                                            |              |             |                                    |
| 5                                                            |              |             |                                    |
| 6                                                            |              |             |                                    |
| 7                                                            |              |             |                                    |
| 8                                                            | E            | E           |                                    |
| 8                                                            | L            | L           |                                    |
| 8                                                            | P            | P           |                                    |
| 9                                                            |              | E           |                                    |
| 10                                                           |              |             |                                    |
| 11                                                           |              |             |                                    |

## REPORT A02

| A02: PLOT INFORMATION REPORT (A1)       |          |                  |            |         |        |          |            | PAGE 8                             |
|-----------------------------------------|----------|------------------|------------|---------|--------|----------|------------|------------------------------------|
| CRUISE#: 20002 SALE#: 20002             |          |                  |            |         |        |          |            | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                       |          |                  |            |         |        |          |            | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM |          |                  |            |         |        |          |            |                                    |
| CRUISE NO.                              | PLOT NO. | CUTTING UNIT NO. | STRATA NO. | SLOPE % | ASPECT | PLOT KPI | NULL PLOT? |                                    |
| 20002                                   | 6        | 4                | 4          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 7        | 4                | 4          | 0       | 0      | 0        | YES        |                                    |
| 20002                                   | 8        | 4                | 4          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 9        | 4                | 4          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 10       | 4                | 4          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 11       | 4                | 4          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 12       | 4                | 4          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 1        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 2        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 3        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 4        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 5        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 6        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 7        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 8        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 9        | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 10       | 5                | 5          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 1        | 6                | 6          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 2        | 6                | 6          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 3        | 6                | 6          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 4        | 6                | 6          | 0       | 0      | 0        | YES        |                                    |
| 20002                                   | 5        | 6                | 6          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 6        | 6                | 6          | 0       | 0      | 0        |            |                                    |
| 20002                                   | 7        | 6                | 6          | 0       | 0      | 0        |            |                                    |

## REPORT A03

A03: LISTING OF TREE MEASUREMENTS AND CHARACTERISTICS (A2)

CRUISE#: 20002 SALE#: 20002

SALENAME: R2 Test

RUN DATE & TIME: 12/12/2013 12:51:31 PM

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VERSION: DRAFT.2013

VOLUME LIBRARY VERSION: 09.23.2013

| <div> <div> <div>T</div> <div>C R</div> <div>U P L</div> <div>E Y I</div> <div>R R S T N E</div> <div>O S H L V</div> <div>P O O M / T</div> <div>F T I D E D T</div> <div>E D D P L / C</div> <div>I D / B O</div> <div>E M O</div> <div>M M C D H T</div> <div>P S G A E U</div> <div>E A D O E -</div> <div>R E R V A N</div> <div>A T E M A O H</div> <div>I C F E S T</div> <div>S E F P D B T</div> </div> </div> |   |   |    |    |    |    |   |    |   |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|----|---|----|---|--------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 2 | PP | 01 | 02 | CM | 1 | 03 | 5 | CL L 11.1 36 |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 3 | LP | 01 | 02 | CM | 1 | 03 | 5 | CL L 11.6 51 |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 4 | PP | 01 | 02 | CM | 1 | 03 | 5 | CL L 11.9 47 |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 5 | ES | 01 | 02 | CM | 1 | 03 | 4 | CL L 8.1 45  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 6 | LP | 01 | 02 | CM | 1 | 03 | 5 | CL L 9.5 44  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 7 | PP | 01 | 02 | CM | 1 | 03 | 5 | CL L 11.1 55 |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                       | 1 | 8 | PP | 01 | 02 | CM | 1 | 03 | 5 | CL L 11.1 55 |

## REPORT A04

| A04: COUNT TABLE INFORMATION (A2)                                                                        |         |              |         |           |          |             |     |             |  | PAGE 25                            |
|----------------------------------------------------------------------------------------------------------|---------|--------------|---------|-----------|----------|-------------|-----|-------------|--|------------------------------------|
| CRUISE#: 20002 SALE#: 20002                                                                              |         |              |         |           |          |             |     |             |  | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                                                                                        |         |              |         |           |          |             |     |             |  | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM                                                                  |         |              |         |           |          |             |     |             |  |                                    |
| THE FOLLOWING INFORMATION IS PROVIDED FOR TREE-BASED METHODS AND REPRESENTS WHAT ONCE WERE COUNT RECORDS |         |              |         |           |          |             |     |             |  |                                    |
| CUTTING UNIT                                                                                             | STRATUM | SAMPLE GROUP | SPECIES | FREQUENCY | K2 VALUE | TALLY COUNT | KPI | DESCRIPTION |  |                                    |
| 2                                                                                                        | 2       | E            | ES      | 0         | 0        | 100         | 578 | E           |  |                                    |
| 2                                                                                                        | 2       | P            | PP      | 0         | 0        | 219         | 477 | P           |  |                                    |
| 2                                                                                                        | 2       | L            | LP      | 0         | 0        | 110         | 497 | L           |  |                                    |
| 8                                                                                                        | 8       | E            | ES      | 0         | 0        | 240         | 0   | E           |  |                                    |
| 8                                                                                                        | 8       | L            | LP      | 0         | 0        | 201         | 0   | L           |  |                                    |
| 8                                                                                                        | 8       | P            | PP      | 0         | 0        | 211         | 0   | P           |  |                                    |
| 9                                                                                                        | 9       | E            | ES      | 0         | 0        | 331         | 0   | E           |  |                                    |
| 9                                                                                                        | 9       | L            | LP      | 0         | 0        | 347         | 0   | L           |  |                                    |
| 9                                                                                                        | 9       | P            | PP      | 0         | 0        | 388         | 0   | P           |  |                                    |

## REPORT A05

A05: CUBIC FOOT

PRIMARY AND SECONDARY PRODUCT

VOLUME INFORMATION (A5)

CRUISE#: 20002 SALE#: 20002

SALENAME: R2 Test

RUN DATE & TIME: 12/12/2013 12:51:31 PM

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VERSION: DRAFT.2013

VOLUME LIBRARY VERSION: 09.23.2013

|   |   |    |    |      |    |      |      |     |     | ***** PER TREE ***** |       |       |      | ***** PER ACRE/PER STRATA ***** |      |     |       |      |       |      |
|---|---|----|----|------|----|------|------|-----|-----|----------------------|-------|-------|------|---------------------------------|------|-----|-------|------|-------|------|
|   |   |    |    |      |    |      |      |     |     | *** PRIMARY ***      |       |       |      | ** SECONDARY **                 |      |     |       |      |       |      |
|   |   |    |    |      |    |      |      |     |     | ** PRIMARY **        |       |       |      | ** SECONDARY **                 |      |     |       |      |       |      |
| S | P | D  | O  | T    | E  | B    | T    | R   | U   | GROSS                | NET   | GROSS | NET  | TREE                            | CHAR | EXP | GROSS | NET  | GROSS | NET  |
| T | R | C  | H  | A    | N  | L    | R    | I   | -   | CUFT                 | CUFT  | CUFT  | CUFT | FAC                             | FAC  | FAC | CUFT  | CUFT | CUFT  | CUFT |
| T | I | O  | E  | E    | O  | G    | A    | T   | T   |                      |       |       |      |                                 |      |     |       |      |       |      |
| 1 | 1 | 2  | PP | 11.1 | 36 | 6.2  | 5.9  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 6.2  | 5.9                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 3  | LP | 11.6 | 51 | 13.9 | 13.2 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 13.9 | 13.2                            | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 4  | PP | 11.9 | 47 | 11.4 | 10.8 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 11.4 | 10.8                            | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 5  | ES | 8.1  | 45 | 3.2  | 3.1  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 3.2  | 3.1                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 6  | LP | 9.5  | 44 | 8.0  | 7.6  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 8.0  | 7.6                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 7  | PP | 11.1 | 55 | 10.1 | 9.6  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 10.1 | 9.6                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 8  | PP | 11.4 | 52 | 11.0 | 10.5 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 11.0 | 10.5                            | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 9  | ES | 9.7  | 44 | 6.7  | 6.4  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 6.7  | 6.4                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 10 | LP | 18.8 | 75 | 59.3 | 56.3 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 59.3 | 56.3                            | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 11 | LP | 7.6  | 47 | 3.7  | 3.5  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 3.7  | 3.5                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 12 | LP | 10.0 | 50 | 9.3  | 8.8  | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 9.3  | 8.8                             | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 13 | LP | 11.1 | 65 | 17.6 | 16.7 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 17.6 | 16.7                            | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 14 | LP | 13.0 | 67 | 25.5 | 24.2 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 25.5 | 24.2                            | 0.0  | 0.0 |       |      |       |      |
| 1 | 1 | 15 | LP | 12.9 | 65 | 24.9 | 23.7 | 0.0 | 0.0 | 0.000                | 0.000 | 1.000 | 24.9 | 23.7                            | 0.0  | 0.0 |       |      |       |      |

# REPORT A07

A07: BOARD FOOT

PRIMARY AND SECONDARY PRODUCT

VOLUME INFORMATION (A7)

CRUISE#: 20002 SALE#: 20002

SALENAME: R2 Test

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| S | P | T | C | H | I | O | E | S | T | F | C | E | X | P | G | R | O | S | S | N | E | T | G | R | O | S | S | N | E | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | N | L | R | I | - | H |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| T | I | O | E | E | O | G |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| A | T | T | E | S | C | T |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

| ***** PER TREE ***** |   |      |    |      |    |                 |       |      |     |       |       | ***** PER ACRE/PER STRATA ***** |       |       |     |       |     |                 |       |       |       |       |     |      |     |      |     |     |     |
|----------------------|---|------|----|------|----|-----------------|-------|------|-----|-------|-------|---------------------------------|-------|-------|-----|-------|-----|-----------------|-------|-------|-------|-------|-----|------|-----|------|-----|-----|-----|
| *** PRIMARY ***      |   |      |    |      |    | ** SECONDARY ** |       |      |     |       |       | ** PRIMARY **                   |       |       |     |       |     | ** SECONDARY ** |       |       |       |       |     |      |     |      |     |     |     |
| GROSS                |   | NET  |    |      |    | GROSS           |       | NET  |     |       |       | GROSS                           |       | NET   |     | GROSS |     | NET             |       |       |       | GROSS |     | NET  |     |      |     |     |     |
| BDFT                 |   | BDFT |    |      |    | BDFT            |       | BDFT |     |       |       | BDFT                            |       | BDFT  |     | BDFT  |     | BDFT            |       |       |       | BDFT  |     | BDFT |     |      |     |     |     |
| TREE                 |   | CHAR |    | EXP  |    | TREE            |       | CHAR |     | EXP   |       | TREE                            |       | CHAR  |     | EXP   |     | TREE            |       | CHAR  |       | EXP   |     | TREE |     | CHAR |     | EXP |     |
| 1                    | 1 | 2    | PP | 11.1 | 36 | 30.0            | 29.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 30.0  | 29.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 30.0  | 29.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 3    | LP | 11.6 | 51 | 60.0            | 57.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 60.0  | 57.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 60.0  | 57.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 4    | PP | 11.9 | 47 | 40.0            | 38.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 40.0  | 38.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 40.0  | 38.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 5    | ES | 8.1  | 46 | 10.0            | 10.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 10.0  | 10.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 10.0  | 10.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 6    | LP | 9.5  | 44 | 30.0            | 29.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 30.0  | 29.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 30.0  | 29.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 7    | PP | 11.1 | 55 | 40.0            | 38.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 40.0  | 38.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 40.0  | 38.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 8    | PP | 11.4 | 52 | 40.0            | 38.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 40.0  | 38.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 40.0  | 38.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 9    | ES | 9.7  | 44 | 30.0            | 29.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 30.0  | 29.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 30.0  | 29.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 10   | LP | 18.8 | 75 | 310.0           | 295.0 | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 310.0 | 295.0 | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 310.0 | 295.0 | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 1                    | 1 | 11   | LP | 7.6  | 47 | 20.0            | 19.0  | 0.0  | 0.0 | 0.000 | 0.000 | 1.000                           | 20.0  | 19.0  | 0.0 | 0.0   | 0.0 | 0.000           | 0.000 | 1.000 | 20.0  | 19.0  | 0.0 | 0.0  | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |

# REPORT A11

This report and its companion, A12, consist of two sections. The first page reports net volume, board foot or cubic foot. The second section reflects the estimated number of trees. The example shown below is the net volume section. The second section has the same format.

A11: TREE GRADE REPORT BY SALE -

RDFT NET VOLUME (A12)

FOR CUT TREES ONLY -- PRIMARY PRODUCT ONLY

CRUISE#: 20002      SALE#: 20002

SALENAME: R2 Test

RUN DATE & TIME: 12/12/2013 12:51:31 PM

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VERSION: DRAFT.2013

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| P S      | TREE GRADE |   |   |   |   |   |   |   |   |   |      |         |         |
|----------|------------|---|---|---|---|---|---|---|---|---|------|---------|---------|
| R P      |            |   |   |   |   |   |   |   |   |   |      |         |         |
| O E      |            |   |   |   |   |   |   |   |   |   |      |         |         |
| D C      |            |   |   |   |   |   |   |   |   |   |      |         |         |
| U I      | 0          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | NONE | TOTAL   |         |
| C E      |            |   |   |   |   |   |   |   |   |   |      |         |         |
| T S      |            |   |   |   |   |   |   |   |   |   |      |         |         |
| 01 ES    | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 230396  | 230396  |
| LP       | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 385252  | 385252  |
| PP       | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 201693  | 201693  |
| AS       | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 674399  | 674399  |
| LP       | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 25178   | 25178   |
| 01 TOTAL | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 1516918 | 1516918 |
|          |            |   |   |   |   |   |   |   |   |   |      |         |         |
| SALE     |            |   |   |   |   |   |   |   |   |   |      |         |         |
| TOTAL    | 0          | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0    | 1516918 | 1516918 |

## REPORT A13

|                                              |   |   |            |             |          |                                                                            |        |          |  |                                    |
|----------------------------------------------|---|---|------------|-------------|----------|----------------------------------------------------------------------------|--------|----------|--|------------------------------------|
| A13: LISTING OF GEOSPATIAL INFORMATION (A14) |   |   |            |             |          |                                                                            |        |          |  | PAGE 46                            |
| TREE TABLE INFORMATION                       |   |   |            |             |          |                                                                            |        |          |  |                                    |
| CRUISE#: 20002 SALE#: 20002                  |   |   |            |             |          |                                                                            |        |          |  | VERSION: DRAFT.2013                |
| SALENAME: P2 T**                             |   |   |            |             |          |                                                                            |        |          |  | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 12:51:31 PM      |   |   |            |             |          |                                                                            |        |          |  |                                    |
| S                                            |   |   |            |             |          |                                                                            |        |          |  |                                    |
| T                                            |   |   |            |             |          |                                                                            |        |          |  |                                    |
| D                                            | U | P | T          |             |          |                                                                            |        |          |  |                                    |
| A                                            | M | L | B          |             |          |                                                                            |        |          |  |                                    |
| T                                            | I | O | E          |             |          |                                                                            |        |          |  |                                    |
| A                                            | T | T | E          | SG          | X-METERS | Y-METERS                                                                   | Z-CMUT | METADATA |  |                                    |
| 1                                            | 2 | 2 | 492855.000 | 4490020.200 | 1526.200 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.007728, Point: 1010, Polygon: 1 |        |          |  |                                    |
| 2                                            | 2 | 2 | 492855.100 | 4490068.300 | 1531.700 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.336580, Point: 1212, Polygon: 1 |        |          |  |                                    |
| 3                                            | 2 | 2 | 492855.200 | 4490020.200 | 1526.200 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.007728, Point: 1020, Polygon: 1 |        |          |  |                                    |
| 4                                            | 2 | 2 | 492855.300 | 4490068.300 | 1531.700 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.336580, Point: 1222, Polygon: 1 |        |          |  |                                    |
| 5                                            | 2 | 2 | 492855.400 | 4490020.200 | 1526.200 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.007728, Point: 1030, Polygon: 1 |        |          |  |                                    |
| 6                                            | 2 | 2 | 492855.500 | 4490068.300 | 1531.700 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.336580, Point: 1232, Polygon: 1 |        |          |  |                                    |
| 7                                            | 2 | 2 | 492855.600 | 4490020.200 | 1526.200 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.007728, Point: 1040, Polygon: 1 |        |          |  |                                    |
| 8                                            | 2 | 2 | 492855.700 | 4490068.300 | 1531.700 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.007728, Point: 1050, Polygon: 1 |        |          |  |                                    |
| 9                                            | 2 | 2 | 492855.800 | 4490068.300 | 1526.200 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.336580, Point: 1242, Polygon: 1 |        |          |  |                                    |
| 1                                            | 1 | 2 | 492855.900 | 4490020.200 | 1531.700 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.336580, Point: 1252, Polygon: 1 |        |          |  |                                    |
| 2                                            | 1 | 2 | 493193.000 | 4490068.300 | 1526.200 | test01.tt, UTM Zone 13, NAD83, GFS Accu: 2.007728, Point: 1060, Polygon: 1 |        |          |  |                                    |

## REPORT A14

|                                                  |    |    |     |    |      |       |  |       |  |                                    |
|--------------------------------------------------|----|----|-----|----|------|-------|--|-------|--|------------------------------------|
| A14: SUMMARY OF SPECIES BASED ON UNIT LEVEL DATA |    |    |     |    |      |       |  |       |  | PAGE 15                            |
| FOR CUT TREES ONLY                               |    |    |     |    |      |       |  |       |  |                                    |
| FOR PRIMARY PRODUCT ONLY                         |    |    |     |    |      |       |  |       |  |                                    |
| CRUISE#: 88888 SALE#: 88888                      |    |    |     |    |      |       |  |       |  | VERSION: DRAFT.2014                |
| SALENAME: r8test                                 |    |    |     |    |      |       |  |       |  | VOLUME LIBRARY VERSION: 02.27.2014 |
| RUN DATE & TIME: 3/11/2014 10:04:57 AM           |    |    |     |    |      |       |  |       |  |                                    |
|                                                  | S  | S  |     |    |      |       |  |       |  |                                    |
|                                                  | S  | M  | P   |    |      |       |  |       |  |                                    |
|                                                  | T  | P  | E   |    | AVG  | EST   |  | NO    |  |                                    |
| U                                                | R  | C  | P   |    |      |       |  |       |  |                                    |
| N                                                | A  | G  | I   | R  | BA/  | NO OF |  | SAMP  |  |                                    |
| I                                                | T  | R  | E   | O  |      |       |  |       |  |                                    |
| T                                                | A  | P  | S   | D  | ACRE | TREES |  | TREES |  |                                    |
| 3                                                | 60 | zp | 100 | 02 |      | 24    |  |       |  |                                    |
| 3                                                | 60 | ps | 121 | 01 |      | 6     |  |       |  |                                    |
| 3                                                | 60 | hs | 316 | 01 |      | 12    |  |       |  |                                    |
| 3                                                | 60 | hs | 621 | 01 |      | 12    |  |       |  |                                    |
| 3                                                | 60 | zh | 800 | 02 |      | 24    |  |       |  |                                    |
| 4                                                | 70 | zp | 100 | 02 |      | 20    |  |       |  |                                    |
| 4                                                | 70 | ps | 110 | 01 |      | 10    |  |       |  |                                    |
| 4                                                | 70 | ps | 121 | 01 |      | 10    |  |       |  |                                    |
| 4                                                | 70 | hs | 621 | 01 |      | 10    |  |       |  |                                    |
| 4                                                | 70 | zh | 800 | 02 |      | 25    |  |       |  |                                    |
| 4                                                | 70 | hs | 806 | 01 |      | 10    |  |       |  |                                    |
| 4                                                | 70 | hs | 835 | 01 |      | 5     |  |       |  |                                    |
| 5                                                | 80 | zp | 100 | 02 | 10   |       |  |       |  |                                    |
| 5                                                | 80 | ps | 110 | 01 | 5    |       |  |       |  |                                    |
| 5                                                | 80 | ps | 121 | 01 | 5    |       |  |       |  |                                    |
| 5                                                | 80 | hs | 316 | 01 | 10   |       |  |       |  |                                    |
| 5                                                | 80 | hs | 621 | 01 | 5    |       |  |       |  |                                    |
| 5                                                | 80 | zh | 800 | 02 | 10   |       |  |       |  |                                    |
| 5                                                | 80 | hs | 835 | 01 | 5    |       |  |       |  |                                    |
| TREE BASED CUTTING UNITS -- TALLY BY SPECIES     |    |    |     |    |      |       |  |       |  |                                    |
| 2                                                | 03 | zp | 100 | 02 |      | 436   |  |       |  |                                    |
| 2                                                | 03 | zh | 800 | 02 |      | 541   |  |       |  |                                    |
| 2                                                | 03 | ps | 110 | 01 |      | 323   |  |       |  |                                    |
| 2                                                | 03 | hs | 316 | 01 |      | 273   |  |       |  |                                    |
| 2                                                | 03 | ps | 121 | 01 |      | 0     |  |       |  |                                    |
| 2                                                | 03 | hs | 531 | 01 |      | 0     |  |       |  |                                    |
| 2                                                | 03 | hs | 806 | 01 |      | 0     |  |       |  |                                    |
| 2                                                | 03 | hs | 835 | 01 |      | 0     |  |       |  |                                    |
| 2                                                | 03 | hs | 621 | 01 |      | 0     |  |       |  |                                    |
| 2                                                | 12 | zp | 100 | 02 |      | 436   |  |       |  |                                    |
| 2                                                | 12 | zh | 800 | 02 |      | 541   |  |       |  |                                    |
| 2                                                | 12 | ps | 110 | 01 |      | 323   |  |       |  |                                    |
| 2                                                | 12 | hs | 316 | 01 |      | 273   |  |       |  |                                    |
| 2                                                | 12 | ps | 121 | 01 |      | 0     |  |       |  |                                    |

# REPORT A15

| A15: MERCHANDIZING RULES FOR CURRENT SALE                                                                                                   |         |      |                           |                           |                       |                     |                     | PAGE 37                            |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------|------|---------------------------|---------------------------|-----------------------|---------------------|---------------------|------------------------------------|
| SAWTIMBER AND NON-SAWTIMBER PRODUCTS                                                                                                        |         |      |                           |                           |                       |                     |                     |                                    |
| CRUISE#: 002 SALE#: 002                                                                                                                     |         |      |                           |                           |                       |                     |                     |                                    |
| SALENAME: Amelia Creek                                                                                                                      |         |      |                           |                           |                       |                     |                     | VERSION: DRAFT.2017                |
| RUN DATE & TIME: 4/5/2017 9:25:07 AM                                                                                                        |         |      |                           |                           |                       |                     |                     | VOLUME LIBRARY VERSION: 02.27.2017 |
| VOLUME<br>EQUATION                                                                                                                          | PRODUCT | TRIM | MIN LOG LENGTH<br>PRIMARY | MAX LOG LENGTH<br>PRIMARY | SEGMENTATION<br>LOGIC | MIN MERCH<br>LENGTH | EVEN/ODD<br>SEGMENT | MODIFIED?                          |
| I00FW2W202                                                                                                                                  | 01      | 0.0  | 0                         | 0                         | 0                     | 0                   | 0                   | N/A                                |
| I00FW2W093                                                                                                                                  | 01      | 0.0  | 0                         | 0                         | 0                     | 0                   | 0                   | N/A                                |
| I00FW2W108                                                                                                                                  | 01      | 0.0  | 0                         | 0                         | 0                     | 0                   | 0                   | N/A                                |
| I00FW2W108                                                                                                                                  | 01      | 0.0  | 0                         | 0                         | 0                     | 0                   | 0                   | N/A                                |
| I00FW2W019                                                                                                                                  | 01      | 0.0  | 0                         | 0                         | 0                     | 0                   | 0                   | N/A                                |
| I00FW2W019                                                                                                                                  | 08      | 0.5  | 2                         | 16                        | 22                    | 8                   | 2                   | YES                                |
| I00FW2W202                                                                                                                                  | 08      | 0.5  | 2                         | 16                        | 22                    | 8                   | 2                   | YES                                |
| I00FW2W093                                                                                                                                  | 08      | 0.5  | 2                         | 16                        | 22                    | 8                   | 2                   | YES                                |
| I00FW2W108                                                                                                                                  | 08      | 0.5  | 2                         | 16                        | 22                    | 8                   | 2                   | YES                                |
| SEGMENT DESCRIPTIONS                                                                                                                        |         |      |                           |                           |                       |                     |                     |                                    |
| 21 -- If top seg < 1/2 nom log len, combine with next lowest log                                                                            |         |      |                           |                           |                       |                     |                     |                                    |
| 22 -- Top placed with next lowest log and segmented                                                                                         |         |      |                           |                           |                       |                     |                     |                                    |
| 23 -- Top segment stands on its own                                                                                                         |         |      |                           |                           |                       |                     |                     |                                    |
| 24 -- If top seg < 1/4 log len drop the top. If top >= 1/4 and <= 3/4 nom length,<br>top is 1/2 of nom log lenght, else top is nom log len. |         |      |                           |                           |                       |                     |                     |                                    |

## CSV REPORTS -- Comma-delimited output text files

From selected Reports

| Report | Description                                                      | Available | Modified |
|--------|------------------------------------------------------------------|-----------|----------|
| CSV1   | From Report A05 Cubic Foot Volume Report                         | ✓         |          |
| CSV2   | From Report A06 Dollar Value Report                              | ✓         |          |
| CSV3   | From Report A07 Board Foot Volume Report                         | ✓         |          |
| CSV4   | From Report A10 Biomass Weights Report                           | ✓         |          |
| CSV5   | From Report L1 Log Level Report                                  | ✓         |          |
| CSV6   | From Report L2 Log Stock Table Report                            | ✓         |          |
| CSV7   | From Report ST1 Statistics for Sample Group                      | ✓         |          |
| CSV8   | From Report UC5 Per Unit Volume – Sawtimber and Pulpwood         | ✓         |          |
| CSV9   | From Tree Estimate Table (3P strata ONLY)                        | ✓         |          |
| CSV10  | Comma-delimited output file for import into Timber Theft program | ✓         |          |
| CSV11  | Comma-delimited output file for data in the VSM4 report          | ✓         |          |



**NOTE:** It is critical to have the corresponding standard report included in the text output file before the CSV file can be created. CSV9 is the only exception because it is only created for 3P strata.

## REPORT CSV1

|   | A      | B    | C    | D    | E    | F   | G    | H    | I       | J       | K       | L       | M       | N       | O      | P         | Q         | R         | S         |
|---|--------|------|------|------|------|-----|------|------|---------|---------|---------|---------|---------|---------|--------|-----------|-----------|-----------|-----------|
|   | STRATA | UNIT | PLOT | TREE | SPEC | DBH | HGT1 | HGT2 | GCUFTPP | NCUFTPP | GCUFTSP | NCUFTSP | TREEFAC | CHARFAC | EXPFAC | PAGCUFTPP | PANCUFTPP | PAGCUFTSP | PANCUFTSP |
| 2 | 1      | 1    |      | 1 RF |      | 12  | 50   |      | 11.4    | 10.5    | 1.7     | 1.7     | 0       | 0       | 2.75   | 31.3      | 28.9      | 4.7       | 4.7       |
| 3 | 1      | 1    |      | 2 RF |      | 5   | 30   |      | 1.3     | 1.3     | 0       | 0       | 0       | 0       | 2      | 2.6       | 2.6       | 0         | 0         |
| 4 | 1      | 1    |      | 3 RF |      | 16  | 80   |      | 35      | 35      | 1.6     | 1.6     | 0       | 0       | 2.75   | 96.3      | 96.3      | 4.4       | 4.4       |
| 5 | 1      | 1    |      | 4 RF |      | 5   | 30   |      | 1.3     | 1.3     | 0       | 0       | 0       | 0       | 2      | 2.6       | 2.6       | 0         | 0         |
| 6 | 1      | 2    |      | 1 RF |      | 15  | 75   |      | 28.2    | 28.2    | 1.6     | 1.6     | 0       | 0       | 2.75   | 77.6      | 77.6      | 4.4       | 4.4       |
| 7 | 1      | 2    |      | 2 RF |      | 15  | 75   |      | 28.2    | 28.2    | 1.6     | 1.6     | 0       | 0       | 2.75   | 77.6      | 77.6      | 4.4       | 4.4       |
| 8 | 1      | 2    |      | 3 RF |      | 5   | 25   |      | 1       | 1       | 0       | 0       | 0       | 0       | 2      | 2         | 2         | 0         | 0         |
| 9 | 1      | 2    |      | 4 RF |      | 5   | 20   |      | 0.7     | 0.7     | 0       | 0       | 0       | 0       | 2      | 1.4       | 1.4       | 0         | 0         |

## ***CURRENTLY UNAVAILABLE***

### **EX REPORTS -- Variable Log Length Reports**

These reports deal with variable log length information used for export grade cruises. All values are for cut trees only.

| <i>Report</i> | <i>Description</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <i>Available</i> | <i>Modified</i> |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| EX1           | A listing of log detail information when Cruise Type in the key file is "V". Lists strata, unit, plot, tree, log number, species, log sort code, log grade code, log length, and percent defect.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                 |
| EX2           | Export Sort and Grade Edit Checks – This report must be requested by the user. It does not run automatically when Cruise Type is "V". There are five possible error conditions generated in this report. If the log sort is incorrect or missing, the record is listed with stars in the sort field. The same error can occur for log grade with similar results. The record is also printed if the log length, log diameter, or BDFT volume is below the required minimum. If errors are detected, the <b>PROGRAM IS STOPPED</b> . A warning message is displayed on screen alerting the user that errors were found and listed in this report. |                  |                 |
| EX3           | Export Sort and Grade Minimums Report – This report displays the current log sort and grade codes along with current minimums. Fields shown are sort, grade, code, name, minimum diameter, minimum length, minimum BDFT, and minimum defect.                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                 |
| EX4           | Sort/Grade Log Stock Table – Report displays net MBF by species and sort/grade combinations. Each table displays the species, the log DIB small end 1 inch diameter class, and the sort/grade combinations. Sort/grade totals are shown at the bottom along with a total for the species.                                                                                                                                                                                                                                                                                                                                                        |                  |                 |
| EX5           | Same as report EX4 only reports net CCF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |
| EX6           | Volume by Species/Sort/Grade Within Unit for Each Stratum – Report displays BDFT and CUFT volume by species/sort/grade combinations. Fields shown include strata, unit, species, log sort, grade, estimated number of logs, gross and net BDFT volume, gross and net CUFT volume, percent defect, and average length. Subtotals are shown for each unit and each stratum with an overall total at the end of the report.                                                                                                                                                                                                                         |                  |                 |
| EX7           | Volume by Species/Sort/Grade for Each Stratum – This report shows volumes by species/sort/grade                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  |                 |

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**EX REPORTS -- Variable Log Length Reports**

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These reports deal with variable log length information used for export grade cruises. All values are for cut trees only.

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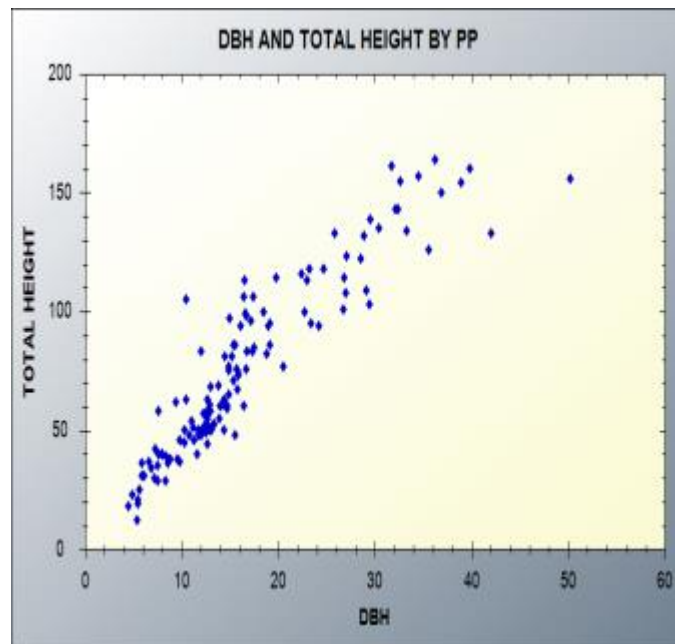
| <i>Report</i> | <i>Description</i>                                                                                                                                                                                                                                                                                                                                       | <i>Available</i> | <i>Modified</i> |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
|               | combinations. Fields include strata, species, log sort, grade, estimated number of logs, gross and net BDFT volume, gross and net CUFT volume, percent defect, and average length. Subtotals by strata are also shown. At the end of the report, a summary of species/sort/grade totals for all strata is displayed followed by an overall report total. |                  |                 |
|               |                                                                                                                                                                                                                                                                                                                                                          |                  |                 |

## GR REPORTS -- Graphs

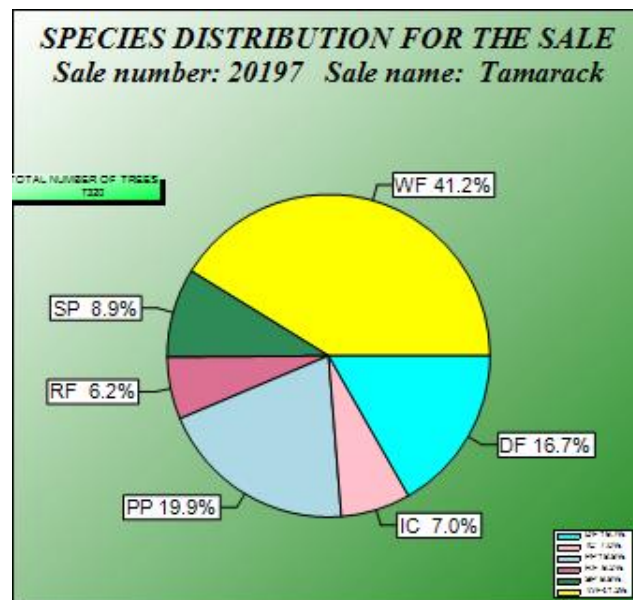
Graph selections include scatter plot, pie chart or bar chart forms. Data graphed varies and may include DBH for each species or species distribution for the sale

| Report | Description                                                                                                                                             | Available | Modified |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| GR01   | Scatter plot of DBH and Total Height for each species – produces one graph per species                                                                  | ✓         |          |
| GR02   | Species Distribution for the Sale – produces one pie chart for the sale                                                                                 | ✓         |          |
| GR03   | Volume by Species – Sawtimber Only – produces a pie chart for each species                                                                              | ✓         |          |
| GR04   | Volume by Product – produces a pie chart for each product                                                                                               | ✓         |          |
| GR05   | Number of logs by DIB class by Species – produces a bar chart for each species. Option is available to use 16-foot or 32-foot log lengths in the graph. | ✓         |          |
| GR06   | Number of Trees by DBH – produces a bar chart for the sale                                                                                              | ✓         |          |
| GR07   | Number of Trees by Species – produces a bar chart for each species                                                                                      | ✓         |          |
| GR08   | Number of Trees by DBH by Stratum -- produces a bar chart for each stratum                                                                              | ✓         |          |
| GR09   | Number of Trees by KPI by Species – produces a bar chart for each species <b>(3P Strata ONLY)</b>                                                       | ✓         |          |
| GR10   | Basal Area Per Acre by Species by Stratum – pie chart <b>(ONLY For Stratum with Basal Area Factor)</b>                                                  | ✓         |          |
| GR11   | Basal Area Per Acre by Sample Group – bar chart <b>(ONLY For Stratum with Basal Area Factor)</b>                                                        | ✓         |          |
|        |                                                                                                                                                         |           |          |

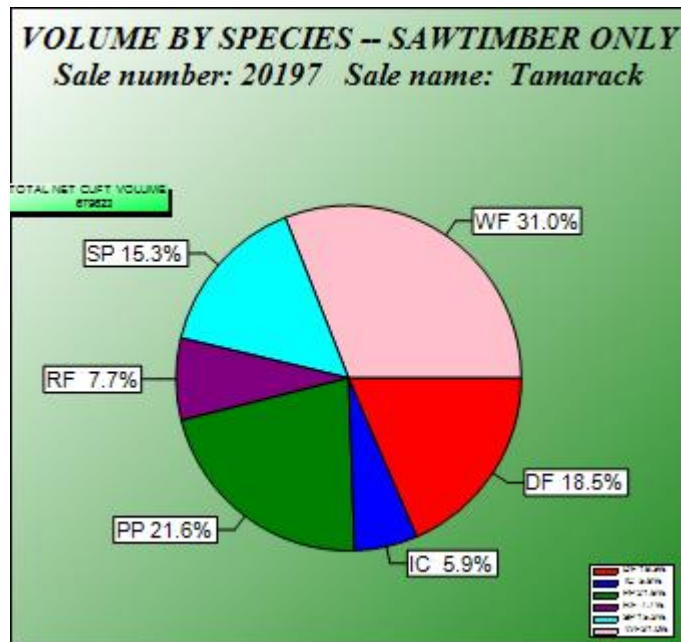
## GR01



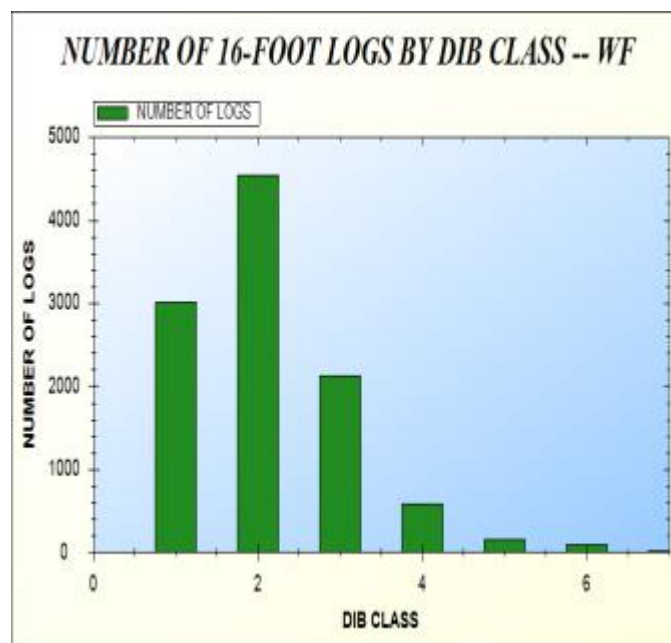
## GR02



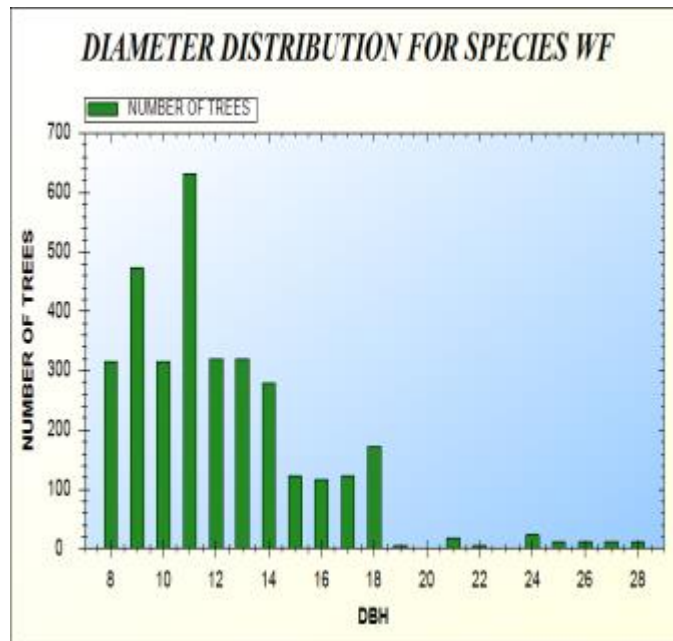
## GR03



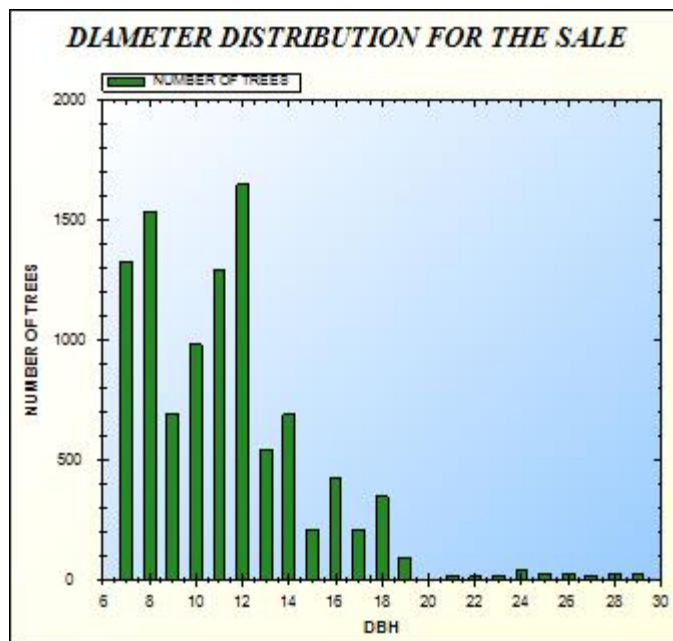
## GR05



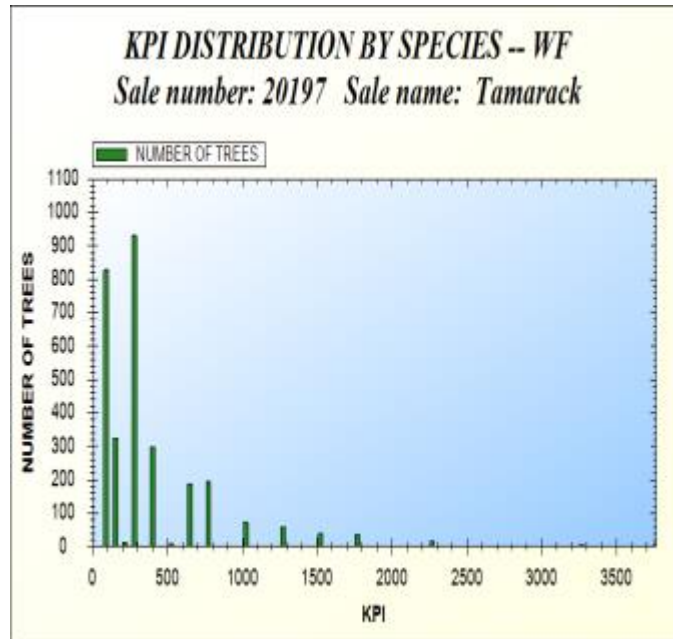
## GR06



## GR07



## GR09



## **L REPORTS -- Log Level Reports**

These reports deal with log level detail and are used where log grade information is entered.

Log Stock Tables – Information Displayed by Species and 3” Diameter Classes.

Diameter Range is from 6 to 84 Inches.

| <i>Report</i> | <i>Description</i>                                                                                                                                                                                                                                                                              | <i>Available</i> | <i>Modified</i> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| L1            | A listing of each log with the log volume, diameter, species, grade and expansion factor as well as gross volume, gross removed volume, and net volume for board foot and cubic foot volumes. When Cruise Type in the Key file is “V”, this report displays Variable Log Length” as the header. | ✓                |                 |
| L2            | Net board foot volumes by species, log dib class, and grade. Reports: grade totals, total net volume, cull log, defect, and overall totals.                                                                                                                                                     | ✓                |                 |
| L3            | Same as ‘L2’ except results are put in an output file. Format of file: species index, log dib class, and totals for log grades 1 – 7.                                                                                                                                                           |                  |                 |
| L4            | Net cubic foot volumes by species, log dib class, and grade. Reports: grade totals, total net volume, cull log, defect, and overall totals.                                                                                                                                                     |                  |                 |
| L5            | Same as ‘L4’ except results are put in an output file. Format of file: species index, log dib class, and totals for log grades 1 – 7.                                                                                                                                                           |                  |                 |
| L6            | Same as ‘L3’ except the species code is written to the output file instead of the species index. Format of file: species code, log dib class, and totals for log grades 1 – 7.                                                                                                                  |                  |                 |
| L7            | Same as ‘L5’ except the species code is written to the output file instead of the species index. Format of file: species code, log dib class, and totals for log grades 1 – 7.                                                                                                                  |                  |                 |
| L8            | Primary Product, Secondary Product, and Total – Board and Cubic Foot – Gross and Net Volumes and Number of Trees – by species and log dib class.                                                                                                                                                | ✓                |                 |
| L9            | Same as report L8 except volumes totaled across all species.                                                                                                                                                                                                                                    |                  |                 |
|               |                                                                                                                                                                                                                                                                                                 |                  |                 |

## L REPORTS -- Log Level Reports

These reports deal with log level detail and are used where log grade information is entered.

Log Stock Tables – Information Displayed by Species and 3” Diameter Classes.

Diameter Range is from 6 to 84 Inches.

| Report | Description                                                                                                                                                                          | Available | Modified |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| L10    | Log counts and volume by log length and species for primary product only. Report is by 1-inch diameter class. <b>NOTE: Lengths less than 8 feet are not included in this report.</b> | ✓         |          |

### REPORT L1

| L1: LOG GRADE FILE                     |     |   |   |      |    |    |   |   |      | PAGE 7                             |       |      |       |       |       |     |        |      |     |      |   |       |
|----------------------------------------|-----|---|---|------|----|----|---|---|------|------------------------------------|-------|------|-------|-------|-------|-----|--------|------|-----|------|---|-------|
| CRUISE#: 06002 SALE#: 06002            |     |   |   |      |    |    |   |   |      | VERSION: DRAFT.2013                |       |      |       |       |       |     |        |      |     |      |   |       |
| SALENAME: Region 6 Test File too       |     |   |   |      |    |    |   |   |      | VOLUME LIBRARY VERSION: 09.23.2013 |       |      |       |       |       |     |        |      |     |      |   |       |
| RUN DATE & TIME: 12/12/2013 1:46:49 PM |     |   |   |      |    |    |   |   |      |                                    |       |      |       |       |       |     |        |      |     |      |   |       |
| U                                      |     |   |   |      |    |    |   |   |      |                                    |       |      |       |       |       |     |        |      |     |      |   |       |
| S                                      |     |   |   | S    | P  | O  | L | S | L    |                                    |       |      |       |       |       |     |        |      |     |      |   |       |
| T                                      |     |   |   | P    | R  | F  | O | M | G    |                                    |       | L    | E     | D     | E     | R   |        |      |     |      |   |       |
| R                                      | U   | P | T | E    | O  |    | G |   |      |                                    |       | G    | R     | F     | E     | C   |        |      |     |      |   |       |
| A                                      | N   | L | R | I    | U  | E  | N | I | I    | N                                  |       | A    | E     | E     | C     |     |        |      |     |      |   |       |
| T                                      | I   | O | E | E    | C  | A  | U | A | A    | T                                  |       | D    | C     | V     |       |     |        |      |     |      |   |       |
| A                                      | T   | T | E | S    | T  | S  | M | M | M    | H                                  |       | E    | T     | B     |       |     |        |      |     |      |   |       |
|                                        |     |   |   |      |    |    |   |   |      | GROSS                              | BDFT  | NET  | GROSS | CUBIC | NET   | DIB | TOTAL  |      |     |      |   |       |
|                                        |     |   |   |      |    |    |   |   |      | BDFT                               | REMVD | BDFT | CUBIC | REMVD | CUBIC | CLS | EXPANS |      |     |      |   |       |
| 10                                     | 10a |   |   | 3 LP | 01 | 03 |   | 1 | 11.5 | 0.0                                | 16.0  | 1    | 4     | 0     | 67.0  | 0.0 | 64.0   | 13.2 | 0.0 | 12.7 | 4 | 1.000 |
| 10                                     | 10a |   |   | 4 LP | 01 | 03 |   | 1 | 11.5 | 0.0                                | 16.0  | 1    | 4     | 0     | 67.0  | 0.0 | 64.0   | 13.2 | 0.0 | 12.7 | 4 | 1.000 |
| 10                                     | 10a |   |   | 4 LP | 01 | 03 |   | 2 | 5.0  | 11.5                               | 8.0   | 1    | 3     | 0     | 9.0   | 0.0 | 9.0    | 3.2  | 0.0 | 3.1  | 2 | 1.000 |
| 10                                     | 10a |   |   | 5 LP | 01 | 03 |   | 1 | 11.5 | 0.0                                | 16.0  | 1    | 4     | 0     | 67.0  | 0.0 | 64.0   | 13.2 | 0.0 | 12.7 | 4 | 1.000 |
| 10                                     | 10a |   |   | 5 LP | 01 | 03 |   | 2 | 5.0  | 11.5                               | 8.0   | 1    | 3     | 0     | 9.0   | 0.0 | 9.0    | 3.2  | 0.0 | 3.1  | 2 | 1.000 |
| 10                                     | 10a |   |   | 6 LP | 01 | 03 |   | 1 | 11.5 | 0.0                                | 16.0  | 1    | 4     | 0     | 67.0  | 0.0 | 64.0   | 13.2 | 0.0 | 12.7 | 4 | 1.000 |
| 10                                     | 10a |   |   | 6 LP | 01 | 03 |   | 2 | 5.0  | 11.5                               | 16.0  | 1    | 5     | 0     | 17.0  | 0.0 | 16.0   | 6.4  | 0.0 | 6.1  | 2 | 1.000 |
| 10                                     | 10a |   |   | 7 LP | 01 | 03 |   | 1 | 11.5 | 0.0                                | 16.0  | 1    | 4     | 0     | 67.0  | 0.0 | 64.0   | 13.2 | 0.0 | 12.7 | 4 | 1.000 |
| 10                                     | 10a |   |   | 7 LP | 01 | 03 |   | 2 | 6.2  | 11.5                               | 16.0  | 1    | 4     | 0     | 20.0  | 0.0 | 19.0   | 6.9  | 0.0 | 6.6  | 2 | 1.000 |
| 10                                     | 10a |   |   | 8 LP | 01 | 03 |   | 1 | 11.5 | 0.0                                | 16.0  | 1    | 4     | 0     | 67.0  | 0.0 | 64.0   | 13.2 | 0.0 | 12.7 | 4 | 1.000 |
| 10                                     | 10a |   |   | 8 LP | 01 | 03 |   | 2 | 7.7  | 11.5                               | 16.0  | 1    | 4     | 0     | 30.0  | 0.0 | 29.0   | 8.1  | 0.0 | 7.8  | 3 | 1.000 |

### REPORT L2

|                                        |                         |         |         |         |         |         |         |         |  |        |          |                                    |            |  |  |
|----------------------------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|--|--------|----------|------------------------------------|------------|--|--|
| L2: LOG STOCK TABLE - MSF              |                         |         |         |         |         |         |         |         |  |        |          | PAGE 87                            |            |  |  |
| CRUISE#: 06002 SALE#: 06002            |                         |         |         |         |         |         |         |         |  |        |          | VERSION: DRAFT.2013                |            |  |  |
| SALENAME: Region 6 Test File too       |                         |         |         |         |         |         |         |         |  |        |          | VOLUME LIBRARY VERSION: 09.23.2013 |            |  |  |
| RUN DATE & TIME: 12/12/2013 1:46:49 PM |                         |         |         |         |         |         |         |         |  |        |          |                                    |            |  |  |
| TABLE 24 - REPORT FOR SPECIES: 098     |                         |         |         |         |         |         |         |         |  |        |          |                                    |            |  |  |
| LOG                                    | ***** NET VOLUMES ***** |         |         |         |         |         |         |         |  | TOTAL  |          |                                    |            |  |  |
| DIB                                    |                         |         |         |         |         |         |         |         |  | NET    | CULL LOG | DEFECT                             | TOTAL NET  |  |  |
| CLASS                                  | GRADE 0                 | GRADE 1 | GRADE 2 | GRADE 3 | GRADE 4 | GRADE 5 | GRADE 6 | GRADE 7 |  | VOLUME | GRD=8,9  | GRD=1-7                            | + CULL LOG |  |  |
|                                        |                         |         |         |         |         |         |         |         |  |        |          |                                    | + DEFECT   |  |  |
| 1                                      | 0.00                    | 27.66   | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    |  | 27.66  | 0.00     | 3.18                               | 30.84      |  |  |
| 6                                      | 0.00                    | 5.72    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    |  | 5.72   | 0.00     | 0.64                               | 6.36       |  |  |
| 9                                      | 0.00                    | 11.13   | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    |  | 11.13  | 0.00     | 1.27                               | 12.40      |  |  |
| 11                                     | 0.00                    | 19.07   | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    |  | 19.07  | 0.00     | 2.23                               | 21.30      |  |  |
| TOTALS                                 | 0.00                    | 63.58   | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    |  | 63.58  | 0.00     | 7.31                               | 70.89      |  |  |

## REPORT L8

| L8: LOG STOCK TABLE - BOARD AND CUBIC  |              |               |             |               |             |                      |                                    |             |                       | PAGE 103                           |             |
|----------------------------------------|--------------|---------------|-------------|---------------|-------------|----------------------|------------------------------------|-------------|-----------------------|------------------------------------|-------------|
| CRUISE#: 06002      SALE#: 06002       |              |               |             |               |             |                      |                                    |             |                       | VERSION: DRAFT.2013                |             |
| SALENAME: Region 6 Test File too       |              |               |             |               |             |                      |                                    |             |                       | VOLUME LIBRARY VERSION: 09.23.2013 |             |
| RUN DATE & TIME: 12/12/2013 1:46:49 PM |              |               |             |               |             |                      |                                    |             |                       |                                    |             |
| TABLE 39 - REPORT FOR SPECIES: 017     |              |               |             |               |             |                      |                                    |             |                       |                                    |             |
| LOG<br>DIB<br>CLASS                    | # OF<br>LOGS | GROSS<br>BDFT | NET<br>BDFT | GROSS<br>CUFT | NET<br>CUFT | ****<br># OF<br>LOGS | SECONDARY PRODUCT<br>GROSS<br>CUFT | NET<br>CUFT | *****<br># OF<br>LOGS | TOTAL<br>GROSS<br>CUFT             | NET<br>CUFT |
| 3                                      | 10013.0      | 53809.0       | 53809.0     | 13265.2       | 13265.2     | 0.0                  | 0.0                                | 0.0         | 10013.0               | 13265.2                            | 13265.2     |
| 5                                      | 11262.0      | 125135.0      | 111371.0    | 21022.6       | 18895.3     | 0.0                  | 0.0                                | 0.0         | 11262.0               | 21022.6                            | 18895.3     |
| 6                                      | 7507.0       | 150140.0      | 135126.0    | 27776.6       | 24773.8     | 0.0                  | 0.0                                | 0.0         | 7507.0                | 27776.6                            | 24773.8     |
| TOTALS                                 | 28782.0      | 329084.0      | 300306.0    | 62064.4       | 56934.3     | 0.0                  | 0.0                                | 0.0         | 28782.0               | 62064.4                            | 56934.3     |

## REPORT L10

This report potentially has three sections. The format is the same for all three. The first section shown below reflects log counts by length and diameter class. If cubic foot volume was calculated the second section appears. And, if board foot volume was calculated, the third section appears. Each section appears for each species in the data.

|                                                                                    |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
|------------------------------------------------------------------------------------|----|------|------|------|-------|------|-----|-----|-----|-----|-----|-----|-----|------------------------------------|
| L10: LOG COUNTS AND VOLUME BY LENGTH AND SPECIES                                   |    |      |      |      |       |      |     |     |     |     |     |     |     | PAGE 25                            |
| FOR CUT TREES ONLY - BY 1" DIAMETER CLASS                                          |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| (5-inch class = 4.6 - 5.5 inches; 9-inch class = 8.6 - 9.5 inches, and so on.)     |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| CRUISE#: 06002 SALE#: 06002                                                        |    |      |      |      |       |      |     |     |     |     |     |     |     | VERSION: DRAFT.2013                |
| SALENAME: Region 6 Test File too                                                   |    |      |      |      |       |      |     |     |     |     |     |     |     | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 1:46:49 PM                                             |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| NOTE: THIS REPORT DOES NOT INCLUDE ANY COUNT OF THE SECONDARY PRODUCT OR CULL LOGS |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| SPECIES - 017 - LOG COUNTS                                                         |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| LENGTH                                                                             | 8' | 10'  | 12'  | 14'  | 16'   | 18'  | 20' | 22' | 24' | 26' | 28' | 30' | 32' | TOTALS                             |
| 3                                                                                  | 1  | 1    | 2503 | 3753 | 3753  | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 10013                              |
| 5                                                                                  | 1  | 2503 | 1251 | 1    | 3753  | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 11262                              |
| 6                                                                                  | 0  | 0    | 0    | 0    | 0     | 7507 | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 7507                               |
| TOTALS                                                                             | 2  | 2504 | 3754 | 3754 | 15013 | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 28782                              |
| L10: LOG COUNTS AND VOLUME BY LENGTH AND SPECIES                                   |    |      |      |      |       |      |     |     |     |     |     |     |     | PAGE 26                            |
| FOR CUT TREES ONLY - BY 1" DIAMETER CLASS                                          |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| (5-inch class = 4.6 - 5.5 inches; 9-inch class = 8.6 - 9.5 inches, and so on.)     |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| CRUISE#: 06002 SALE#: 06002                                                        |    |      |      |      |       |      |     |     |     |     |     |     |     | VERSION: DRAFT.2013                |
| SALENAME: Region 6 Test File too                                                   |    |      |      |      |       |      |     |     |     |     |     |     |     | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 1:46:49 PM                                             |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| NOTE: THIS REPORT DOES NOT INCLUDE ANY COUNT OF THE SECONDARY PRODUCT OR CULL LOGS |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| SPECIES - 017 - NET CCF VOLUME                                                     |    |      |      |      |       |      |     |     |     |     |     |     |     |                                    |
| LENGTH                                                                             | 8' | 10'  | 12'  | 14'  | 16'   | 18'  | 20' | 22' | 24' | 26' | 28' | 30' | 32' | TOTALS                             |
| 3                                                                                  | 0  | 0    | 28   | 49   | 56    | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 133                                |
| 5                                                                                  | 0  | 38   | 23   | 0    | 103   | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 189                                |
| 6                                                                                  | 0  | 0    | 0    | 0    | 248   | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 248                                |
| TOTALS                                                                             | 0  | 38   | 50   | 49   | 407   | 0    | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 569                                |

## LD REPORTS – Live/Dead Volume

Live/Dead volume by a variety of combinations: Product and Species; Cutting Unit, Product and Species; Payment Unit, Product and Species; and Logging Method, Product and Species.

| Report | Description                                                               | Available | Modified |
|--------|---------------------------------------------------------------------------|-----------|----------|
| LD1    | Live/Dead cubic foot volume by product and species (CS4)                  | ✓         |          |
| LD2    | Live/Dead board foot volume by product and species (CS5)                  | ✓         |          |
| LD3    | Live/Dead cubic foot volume by cutting unit, product and species (CS6)    | ✓         |          |
| LD4    | Live/Dead board foot volume by cutting unit, product and species (CS7)    | ✓         |          |
| LD5    | Live/Dead cubic foot volume by payment unit, product and species (CS8)    | ✓         |          |
| LD6    | Live/Dead board foot volume by payment unit, product and species (CS9)    | ✓         |          |
| LD7    | Live/Dead cubic foot volume by logging method, product and species (CS10) | ✓         |          |
| LD8    | Live/Dead board foot volume by product and species (CS11)                 | ✓         |          |
|        |                                                                           |           |          |

## REPORT LD1

|                                                                                 |       |       |        |        |       |       |       |       |       |       |       |                                    |
|---------------------------------------------------------------------------------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|------------------------------------|
| LD1: LIVE/DEAD VOLUME BY PRODUCT AND SPECIES - CUFT (CS4)                       |       |       |        |        |       |       |       |       |       |       |       | PAGE 3                             |
| FOR THE SALE                                                                    |       |       |        |        |       |       |       |       |       |       |       |                                    |
| FOR CUT TREES ONLY                                                              |       |       |        |        |       |       |       |       |       |       |       |                                    |
| CRUISE#: 20002 SALE#: 20002                                                     |       |       |        |        |       |       |       |       |       |       |       |                                    |
| SALENAME: R2 Test                                                               |       |       |        |        |       |       |       |       |       |       |       | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 2:04:49 PM                                          |       |       |        |        |       |       |       |       |       |       |       | VOLUME LIBRARY VERSION: 09.23.2013 |
| P                                                                               | S     |       |        |        |       |       |       |       |       |       |       |                                    |
| R                                                                               | P     |       |        |        |       |       |       |       |       |       |       |                                    |
| O                                                                               | E     |       |        |        |       |       |       |       |       |       |       |                                    |
| D                                                                               | C     | ***** | LIVE   | *****  | ***** | DEAD  | ***** | ***** | OTHER | ***** | ***** | TOTAL                              |
| U                                                                               | I     | EST.  |        |        | EST.  |       |       | EST.  |       |       | EST.  |                                    |
| C                                                                               | E     | NO OF | GROSS  | NET    | NO OF | GROSS | NET   | NO OF | GROSS | NET   | NO OF | GROSS                              |
| T                                                                               | S     | TREES | CUFT   | CUFT   | TREES | CUFT  | CUFT  | TREES | CUFT  | CUFT  | TREES | CUFT                               |
| 01                                                                              | ES    | 2728  | 51547  | 49483  | 0     | 0     | 0     | 0     | 0     | 0     | 2728  | 51547                              |
| LP                                                                              |       | 4170  | 83449  | 79297  | 0     | 0     | 0     | 0     | 0     | 0     | 4170  | 83449                              |
| PP                                                                              |       | 2099  | 42551  | 40435  | 0     | 0     | 0     | 0     | 0     | 0     | 2099  | 42551                              |
| 01                                                                              | TOTAL | 8997  | 177546 | 169215 | 0     | 0     | 0     | 0     | 0     | 0     | 8997  | 177546                             |
| 14                                                                              | AS    | 7192  | 144123 | 136965 | 0     | 0     | 0     | 0     | 0     | 0     | 7192  | 144123                             |
| LP                                                                              |       | 0     | 0      | 0      | 387   | 5025  | 4774  | 0     | 0     | 0     | 387   | 5025                               |
| 14                                                                              | TOTAL | 7192  | 144123 | 136965 | 387   | 5025  | 4774  | 0     | 0     | 0     | 7579  | 149148                             |
| TOTALS                                                                          |       | 16189 | 321669 | 306180 | 387   | 5025  | 4774  | 0     | 0     | 0     | 16576 | 326693                             |
| NOTE: Volumes include primary, secondary and recovered for each product number. |       |       |        |        |       |       |       |       |       |       |       |                                    |
| Net cubic or board includes recovered volume if present.                        |       |       |        |        |       |       |       |       |       |       |       |                                    |
| Number of trees includes only primary values even though no volume may appear.  |       |       |        |        |       |       |       |       |       |       |       |                                    |

## REPORT LD3

|                                                                         |   |   |        |         |         |       |       |       |       |       |        |                                    |
|-------------------------------------------------------------------------|---|---|--------|---------|---------|-------|-------|-------|-------|-------|--------|------------------------------------|
| LD3: LIVE/DEAD VOLUME BY CUTTING UNIT, PRODUCT AND SPECIES - CUFT (CS6) |   |   |        |         |         |       |       |       |       |       |        | PAGE 5                             |
| FOR THE SALE                                                            |   |   |        |         |         |       |       |       |       |       |        |                                    |
| FOR CUT TREES ONLY                                                      |   |   |        |         |         |       |       |       |       |       |        |                                    |
| CRUISE#: 20002 SALE#: 20002                                             |   |   |        |         |         |       |       |       |       |       |        | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                                                       |   |   |        |         |         |       |       |       |       |       |        | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 2:04:49 PM                                  |   |   |        |         |         |       |       |       |       |       |        |                                    |
| C                                                                       | P | S |        |         |         |       |       |       |       |       |        |                                    |
| U                                                                       | R | P |        |         |         |       |       |       |       |       |        |                                    |
| T                                                                       | R | P |        |         |         |       |       |       |       |       |        |                                    |
| O                                                                       | E |   |        |         |         |       |       |       |       |       |        |                                    |
| U                                                                       | D | C | *****  | LIVE    | *****   | ***** | DEAD  | ***** | ***** | OTHER | *****  | TOTAL *****                        |
| N                                                                       | U | I | EST.   |         |         | EST.  |       |       | EST.  |       |        |                                    |
| I                                                                       | C | E | NO OF  | GROSS   | NET     | NO OF | GROSS | NET   | NO OF | GROSS | NET    |                                    |
| T                                                                       | T | S | TREES  | CUFT    | CUFT    | TREES | CUFT  | CUFT  | TREES | CUFT  | CUFT   |                                    |
|                                                                         |   |   |        |         |         |       |       |       |       |       |        |                                    |
| 01 TOTAL                                                                |   |   | 0      | 0       | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0                                  |
|                                                                         |   |   |        |         |         |       |       |       |       |       |        |                                    |
| 14 AS                                                                   |   |   | 359597 | 7206153 | 6848246 | 0     | 0     | 0     | 0     | 0     | 359597 | 7206153                            |
| LP                                                                      |   |   | 0      | 0       | 0       | 0     | 0     | 0     | 0     | 0     | 0      | 0                                  |
| 14 TOTAL                                                                |   |   | 359597 | 7206153 | 6848246 | 0     | 0     | 0     | 0     | 0     | 359597 | 7206153                            |
|                                                                         |   |   |        |         |         |       |       |       |       |       |        |                                    |
| CUTTING UNIT                                                            |   |   |        |         |         |       |       |       |       |       |        |                                    |
| 3 TOTAL                                                                 |   |   | 359597 | 7206153 | 6848246 | 0     | 0     | 0     | 0     | 0     | 359597 | 7206153                            |

## REPORT LD5

|                                                                         |   |   |       |       |       |       |       |       |       |       |       |                                    |
|-------------------------------------------------------------------------|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------------------|
| LD5: LIVE/DEAD VOLUME BY PAYMENT UNIT, PRODUCT AND SPECIES - CUFT (CS8) |   |   |       |       |       |       |       |       |       |       |       | PAGE 7                             |
| FOR THE SALE                                                            |   |   |       |       |       |       |       |       |       |       |       |                                    |
| FOR CUT TREES ONLY                                                      |   |   |       |       |       |       |       |       |       |       |       |                                    |
| CRUISE#: 20002 SALE#: 20002                                             |   |   |       |       |       |       |       |       |       |       |       | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                                                       |   |   |       |       |       |       |       |       |       |       |       | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 2:04:49 PM                                  |   |   |       |       |       |       |       |       |       |       |       |                                    |
| P                                                                       |   |   |       |       |       |       |       |       |       |       |       |                                    |
| A                                                                       | P | S |       |       |       |       |       |       |       |       |       |                                    |
| Y                                                                       | R | P |       |       |       |       |       |       |       |       |       |                                    |
| O                                                                       | E |   |       |       |       |       |       |       |       |       |       |                                    |
| U                                                                       | D | C | ***** | LIVE  | ***** | ***** | DEAD  | ***** | ***** | OTHER | ***** | TOTAL *****                        |
| N                                                                       | U | I | EST.  |       |       | EST.  |       |       | EST.  |       |       |                                    |
| I                                                                       | C | E | NO OF | GROSS | NET   | NO OF | GROSS | NET   | NO OF | GROSS | NET   |                                    |
| T                                                                       | T | S | TREES | CUFT  | CUFT  | TREES | CUFT  | CUFT  | TREES | CUFT  | CUFT  |                                    |
|                                                                         |   |   |       |       |       |       |       |       |       |       |       |                                    |
| 1 01 ES                                                                 |   |   | 2     | 10    | 10    | 0     | 0     | 0     | 0     | 0     | 0     | 10                                 |
| LP                                                                      |   |   | 10    | 191   | 181   | 0     | 0     | 0     | 0     | 0     | 0     | 181                                |
| PP                                                                      |   |   | 4     | 39    | 37    | 0     | 0     | 0     | 0     | 0     | 0     | 37                                 |
| 01 TOTAL                                                                |   |   | 16    | 239   | 227   | 0     | 0     | 0     | 0     | 0     | 0     | 227                                |
|                                                                         |   |   |       |       |       |       |       |       |       |       |       |                                    |
| 14 AS                                                                   |   |   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                                  |
| LP                                                                      |   |   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                                  |
| 14 TOTAL                                                                |   |   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0                                  |
|                                                                         |   |   |       |       |       |       |       |       |       |       |       |                                    |
| PAYMENT UNIT                                                            |   |   |       |       |       |       |       |       |       |       |       |                                    |
| 1 TOTAL                                                                 |   |   | 16    | 239   | 227   | 0     | 0     | 0     | 0     | 0     | 0     | 227                                |

## REPORT LD7

|                                                                            |   |   |        |         |         |       |       |       |       |       |        |                                    |
|----------------------------------------------------------------------------|---|---|--------|---------|---------|-------|-------|-------|-------|-------|--------|------------------------------------|
| LD7: LIVE/DEAD VOLUME BY LOGGING METHOD, PRODUCT AND SPECIES - CUFT (CS10) |   |   |        |         |         |       |       |       |       |       |        | PAGE 10                            |
| FOR THE SALE                                                               |   |   |        |         |         |       |       |       |       |       |        |                                    |
| FOR CUT TREES ONLY                                                         |   |   |        |         |         |       |       |       |       |       |        |                                    |
| CRUISE#: 20002 SALE#: 20002                                                |   |   |        |         |         |       |       |       |       |       |        | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                                                          |   |   |        |         |         |       |       |       |       |       |        | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 2:04:49 PM                                     |   |   |        |         |         |       |       |       |       |       |        |                                    |
| L                                                                          |   |   |        |         |         |       |       |       |       |       |        |                                    |
| O                                                                          | P | S |        |         |         |       |       |       |       |       |        |                                    |
| G                                                                          | R | P |        |         |         |       |       |       |       |       |        |                                    |
| O                                                                          | E |   |        |         |         |       |       |       |       |       |        |                                    |
| M                                                                          | D | C | *****  | LIVE    | *****   | ***** | DEAD  | ***** | ***** | OTHER | *****  | TOTAL *****                        |
| E                                                                          | U | I | EST.   |         |         | EST.  |       |       | EST.  |       |        |                                    |
| T                                                                          | C | E | NO OF  | GROSS   | NET     | NO OF | GROSS | NET   | NO OF | GROSS | NET    |                                    |
| H                                                                          | T | S | TREES  | CUFT    | CUFT    | TREES | CUFT  | CUFT  | TREES | CUFT  | CUFT   |                                    |
|                                                                            |   |   |        |         |         |       |       |       |       |       |        |                                    |
| 421 01 ES                                                                  |   |   | 14651  | 201339  | 193065  | 0     | 0     | 0     | 0     | 0     | 0      | 193065                             |
| LP                                                                         |   |   | 27638  | 515654  | 490157  | 0     | 0     | 0     | 0     | 0     | 0      | 490157                             |
| PP                                                                         |   |   | 9448   | 279245  | 265465  | 0     | 0     | 0     | 0     | 0     | 0      | 265465                             |
| 01 TOTAL                                                                   |   |   | 51737  | 996238  | 948687  | 0     | 0     | 0     | 0     | 0     | 0      | 948687                             |
|                                                                            |   |   |        |         |         |       |       |       |       |       |        |                                    |
| 14 AS                                                                      |   |   | 359597 | 7206153 | 6848246 | 0     | 0     | 0     | 0     | 0     | 359597 | 7206153                            |
| LP                                                                         |   |   | 0      | 0       | 0       | 6967  | 90442 | 85930 | 0     | 0     | 6967   | 90442                              |
| 14 TOTAL                                                                   |   |   | 359597 | 7206153 | 6848246 | 6967  | 90442 | 85930 | 0     | 0     | 366565 | 7296596                            |
|                                                                            |   |   |        |         |         |       |       |       |       |       |        |                                    |
| LOGGING METHOD                                                             |   |   |        |         |         |       |       |       |       |       |        |                                    |
| 421 TOTAL                                                                  |   |   | 411335 | 8202391 | 7796934 | 6967  | 90442 | 85930 | 0     | 0     | 418302 | 8292833                            |

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**LV REPORTS – Leave Tree Reports**

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Leave Tree reports correspond to cut tree reports as shown in the descriptions below. These reports contain leave trees only. Two summary reports, two statistics reports and one unit level report are available. These reports have the same format as the corresponding report so no examples are shown here.

| <i>Report</i> | <i>Description</i>                                                                       | <i>Available</i> | <i>Modified</i> |
|---------------|------------------------------------------------------------------------------------------|------------------|-----------------|
| LV01          | Volume Summary for Sample Group – corresponds to the VSM2 report.                        | ✓                |                 |
| LV02          | Volume Summary for Strata – corresponds to the VSM3 report                               | ✓                |                 |
| LV03          | Net Volume Statistics for Sample Group – corresponds to the ST1 report                   | ✓                |                 |
| LV04          | Gross Volume Statistics for Sample Group – corresponds to the ST2 report                 | ✓                |                 |
| LV05          | Volume by Species within Cutting Unit Across All Stratum – corresponds to the UC5 report | ✓                |                 |
|               |                                                                                          |                  |                 |

| <b>Region 10 Reports</b> |                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                 |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| <i>Report</i>            | <i>Description</i>                                                                                                                                                                                                                                                                                                                                                                                   | <i>Available</i> | <i>Modified</i> |
| R001                     | Appraisal summary report for board foot by species and showing logging adjustment characteristics.                                                                                                                                                                                                                                                                                                   | ✓                |                 |
| R002                     | Same as 'R001' except shows cubic foot volumes.                                                                                                                                                                                                                                                                                                                                                      | ✓                |                 |
| R003                     | Log grade summary board foot sale volume by species by grade.                                                                                                                                                                                                                                                                                                                                        | ✓                |                 |
| R004                     | Same as 'R003' except shows cubic foot volumes.                                                                                                                                                                                                                                                                                                                                                      | ✓                |                 |
| R005                     | Appraisal summary report by Logging Method. For cut trees and primary product by cubic foot volume. Displays logging method, species, product, scale defect %, woods defect %, total gross removed, gross per acre removed, average log volume, total net CCF, net CCF per acre, estimated number of trees, trees per acre, mean DBH, mean height, logs per CCF, standing gross per acre, and acres. | ✓                |                 |
| R006                     | Summary of net board foot volume by species, diameter and log grade. Now reported as MBF. Creates a flat file only.                                                                                                                                                                                                                                                                                  | ✓                |                 |
| R007                     | Same as R006 only reports net cubic foot volume. Now reports as CCF.                                                                                                                                                                                                                                                                                                                                 | ✓                |                 |
| R008                     | Log Matrix Output File** – A comma-delimited file which includes sale name, cruise number, log sort description, species, log grade, log diameter, standing gross MBF, gross removed MBF, net volume MBF, and net utility MBF.                                                                                                                                                                       | ✓                |                 |
| R009                     | Log Matrix Output File** – A comma-delimited file with the same format as the R008 but the individual categories are different from R008 report.                                                                                                                                                                                                                                                     | ✓                |                 |

\*\* To update the **Log Matrix**, see the section on **Reports**.

## REPORT R001

R001: APPRAISAL SUMMARY REPORT-BDFT VOLUME

PAGE 27

CRUISE#: 12345

SALE#: 12345

SALENAME: DanOTest2

VERSION: DRAFT.2017

RUN DATE & TIME: 3/6/2017 12:57:06 PM

VOLUME LIBRARY VERSION: 02.27.2017

| SALE VOLUMES (MBF) BY SPECIES |                   |                   |
|-------------------------------|-------------------|-------------------|
|                               | GROSS             | NET               |
| Species                       | Sawlog<br>Removed | Sawlog<br>Removed |
| 242                           | 6.885             | 5.309             |
| 263                           | 9.532             | 6.622             |
| 042                           | 2.865             | 2.106             |
| 098                           | 12.987            | 10.632            |
| All Species                   | 32.269            | 24.668            |

| LOGGING CHARACTERISTICS             |        |
|-------------------------------------|--------|
| No. of 32-Ft Logs/MBF Gross removed | 4.37   |
| Avg. MBF Net removed per 32 ft. log | 0.175  |
| Avg. MBF Net removed per acre       | 24.668 |
| Avg. Scaling Defect %               | 23.56  |
| Mean DBH (for cut trees)            | 19.4   |
| Average cut tree volume, Net MBF    | 0.321  |
| Sale MBF/CCF conversion             | 0.48   |

## REPORT R003

| R003: LOG GRADE SUMMARY-BDFT VOLUME   |             |        |         |          |         |         |          | PAGE 54                            |
|---------------------------------------|-------------|--------|---------|----------|---------|---------|----------|------------------------------------|
| SALE VOLUME (MBF) BY SPECIES BY GRADE |             |        |         |          |         |         |          |                                    |
| CRUISE#: New7                         | SALE#: New7 |        |         |          |         |         |          |                                    |
| SALENAME: NewTest                     |             |        |         |          |         |         |          | VERSION: DRAFT.2017                |
| RUN DATE & TIME: 2/23/2017 3:27:36 PM |             |        |         |          |         |         |          | VOLUME LIBRARY VERSION: 11.21.2016 |
| GRADE                                 |             | 242    | 263     | 263Y     | 042     | 098     | 98Y      |                                    |
| 0                                     | STD GRS     | 0.00   | 0.44    | 0.00     | 0.00    | 4.20    | 0.00     |                                    |
|                                       | NET         | 0.00   | 0.32    | 0.00     | 0.00    | 2.67    | 0.00     |                                    |
|                                       | NET %       | 0.00 % | 0.07 %  | 0.00 %   | 0.00 %  | 1.65 %  | 0.00 %   |                                    |
| 1                                     | STD GRS     | 0.00   | 0.00    | 0.00     | 0.75    | 14.46   | 0.00     |                                    |
|                                       | NET         | 0.00   | 0.00    | 0.00     | 0.55    | 9.52    | 0.00     |                                    |
|                                       | NET %       | 0.00 % | 0.00 %  | 0.00 %   | 0.35 %  | 5.87 %  | 0.00 %   |                                    |
| 2                                     | STD GRS     | 0.00   | 281.09  | 0.00     | 61.64   | 143.70  | 0.00     |                                    |
|                                       | NET         | 0.00   | 190.69  | 0.00     | 43.35   | 114.95  | 0.00     |                                    |
|                                       | NET %       | 0.00 % | 40.44 % | 0.00 %   | 27.53 % | 70.86 % | 0.00 %   |                                    |
| 3                                     | STD GRS     | 0.05   | 409.03  | 83.90    | 148.78  | 42.72   | 119.90   |                                    |
|                                       | NET         | 0.04   | 280.50  | 78.12    | 111.92  | 35.08   | 118.89   |                                    |
|                                       | NET %       | 0.01 % | 59.49 % | 100.00 % | 71.07 % | 21.62 % | 100.00 % |                                    |
| 4                                     | STD GRS     | 0.00   | 0.00    | 0.00     | 0.00    | 0.00    | 0.00     |                                    |
|                                       | NET         | 0.00   | 0.00    | 0.00     | 0.00    | 0.00    | 0.00     |                                    |

# REPORT R005

|                                           |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
|-------------------------------------------|-------|----|-------|--------|---------|---------|--------|------|------|-------|--------|------|-------|-------|----------|---------|
| ROOS: APPRAISAL SUMMARY BY LOGGING METHOD |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          | PAGE 17 |
| FOR CUT TREES ONLY - PRIMARY PRODUCT ONLY |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| -- CUBIC FOOT --                          |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| CRUISE#: 67991 SALE#: 67991               |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| SALENAME: Region10 Test Sale              |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| RUN DATE & TIME: 8- 4-2004 16: 1:51       |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| VERSION: DRAFT.2004B                      |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| VOLUME LIBRARY VERSION: 07.29.2004        |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
|                                           |       |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| L                                         | P     |    |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| O                                         | S     | R  |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| G                                         | P     | O  |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
|                                           | R     | D  |       |        |         |         |        |      |      |       |        |      |       |       |          |         |
| M                                         | C     | U  | TOTAL | GROSS/ | AVERAGE | TOTAL   | NET    |      |      |       |        |      |       |       | STANDING |         |
| T                                         | I     | C  | SCALE | WOODS  | GROSS   | ACRE    | LOG    | NET  | CCF/ | ESTIM | TREES/ | MEAN | MEAN  | LOGS/ | GROSS/   |         |
| H                                         | E     | T  | DEF % | DEF %  | REMOVED | REMOVED | VOLUME | CCF  | ACRE | TREES | ACRE   | DBH  | HGT   | CCF   | ACRE     | ACRES   |
|                                           | 042   | 01 | 54.2  | 55.5   | 204     | 1       | 0.31   | 94   | 0    | 10141 | 30.3   | 18.5 | 0.2   | 3.3   | 0.6      | 335     |
|                                           | 098   | 01 | 30.6  | 32.7   | 163     | 0       | 0.29   | 113  | 0    | 4112  | 12.3   | 20.6 | 0.2   | 3.4   | 0.5      |         |
|                                           | 242   | 01 | 33.6  | 35.6   | 190     | 95      | 0.32   | 127  | 63   | 144   | 72.0   | 27.8 | 89.4  | 3.1   | 98.2     |         |
|                                           | 260   | 01 | 45.4  | 47.0   | 466     | 1       | 0.26   | 255  | 1    | 23617 | 70.7   | 18.0 | 0.3   | 3.9   | 1.4      |         |
|                                           | TOTAL |    | 42.6  | 44.3   | 1024    | 3       | 0.28   | 588  | 2    | 38014 | 113.8  | 18.5 | 0.6   | 3.6   | 3.2      |         |
| 430                                       | 042   | 01 | 39.7  | 40.7   | 4656    | 6       | 0.17   | 2806 | 4    | 10278 | 14.2   | 16.7 | 65.3  | 6.1   | 6.5      | 724     |
| 430                                       | 098   | 01 | 8.7   | 11.3   | 3224    | 4       | 0.41   | 2943 | 4    | 1557  | 2.2    | 27.7 | 104.2 | 2.5   | 4.6      |         |
| 430                                       | 242   | 01 | 42.4  | 48.3   | 10860   | 15      | 0.30   | 5763 | 9    | 12324 | 18.2   | 20.5 | 64.2  | 2.3   | 15.4     |         |

# REPORT R006

Note: This is a flat file only. Nothing appears in the reports output file.

| NET BOARD FOOT VOLUME (MBF) BY DIAMETER GROUP FOR: 05074 |         |            |             |        |         |         |              |
|----------------------------------------------------------|---------|------------|-------------|--------|---------|---------|--------------|
| Sale#                                                    | Species | Diam Group | Peel/Select | #1 Saw | #2 Saw  | #3 Saw  | Special Mill |
| 05074                                                    | 098     | 06 - 11    | 0.00        | 0.00   | 0.00    | 1094.52 | 0.00         |
| 05074                                                    | 098     | 12 - 17    | 0.00        | 0.00   | 1571.13 | 725.53  | 59.77        |
| 05074                                                    | 098     | 18 - 23    | 0.00        | 0.00   | 1343.32 | 489.67  | 164.48       |
| 05074                                                    | 098     | 24+        | 0.00        | 29.11  | 935.77  | 92.14   | 78.71        |
| 05074                                                    | 263     | 06 - 11    | 0.00        | 0.00   | 0.00    | 149.75  | 0.00         |
| 05074                                                    | 263     | 12 - 17    | 0.00        | 0.00   | 115.18  | 74.91   | 16.47        |
| 05074                                                    | 263     | 18 - 23    | 0.00        | 0.00   | 85.24   | 25.96   | 63.57        |
| 05074                                                    | 263     | 24+        | 0.00        | 0.00   | 0.00    | 0.00    | 0.00         |

# REPORT R008

Note: This is a flat file only. Nothing appears in the reports output file.

| SALE NAME | CRUISE NUMBER | LOG SORT DESCRIPTION              | SPECIES CODE | LOG GRADE CODE | LOG SED        | GVOL STANDING MBF | GVOL REMVD MBF | NVOL REMVD MBF | NVOL UTILITY MBF |
|-----------|---------------|-----------------------------------|--------------|----------------|----------------|-------------------|----------------|----------------|------------------|
| Region 10 | Test Cruise   | .05092, AYC #PS sawlog MBF net    | .042         | .0             |                |                   | .0000          | .0000          | .0000            |
| Region 10 | Test Cruise   | .05092, AYC #1sawlog MBF net      | .042         | .1             |                | 173.325           | 168.124        | 96.622         | .0000            |
| Region 10 | Test Cruise   | .05092, AYC SM sawlog MBF net     | .042         | .6             |                | 492.419           | 477.689        | 296.091        | .0001            |
| Region 10 | Test Cruise   | .05092, AYC #2 sawlog MBF net     | .042         | .2             |                | 745.005           | 722.399        | 544.062        | .0003            |
| Region 10 | Test Cruise   | .05092, AYC #3 sawlog MBF net     | .042         | .3             |                | 919.663           | 891.619        | 559.490        | .0012            |
| Region 10 | Test Cruise   | .05092, H 1saw 24+ SED            | .263         | .1             | 24.0+          | 948.753           | 778.297        | 569.460        | 142.367          |
| Region 10 | Test Cruise   | .05092, H 2saw 15.0 thru 17.9 SED | .263         | .2             | 15.0 thru 17.9 | 1088.263          | 879.842        | 708.639        | 177.163          |
| Region 10 | Test Cruise   | .05092, H 2saw 18.0 thru 22.9 SED | .263         | .2             | 18.0 thru 22.9 | 2215.588          | 1803.255       | 1380.862       | 347.775          |

## Region 1 Reports

| Report | Description                                                                                                                                                                                                                                                                                                                    | Available | Modified |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| R101   | Volume Summary by Product and Contract Species -- For cut trees and primary product only. Displays contract species, species, product, unit of measure, average defect % for BDFT and CUFT, gross and net BDFT/CUFT ratio, average DBH, gross and net BDFT and CUFT volume, gross CCF per 16' logs and gross MBF per 16' logs. | ✓         |          |
| R102   | Board Foot Summary by Logging Method by Product for Cut Trees Reports: Gross and net volume, average defect (%), estimated number of trees, gross board foot per acre, net board foot per acre, trees per acre, mean dbh, mean ht, net board foot per tree, net 16' logs per gross MBF, average slope, and total acres.        | ✓         |          |
| R103   | Identical to R102 except reports cubic foot volumes.                                                                                                                                                                                                                                                                           | ✓         |          |
| R104   | Basal Area per unit: reports average DBH and basal area per unit by cut or leave designation. Includes stratum, cutting unit, species, sample group and primary product as well.                                                                                                                                               | ✓         |          |

## REPORT R101

|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|--------------------------------------------------------------|-------|-------|----|----|---|--------|--------|------------------------------|--------------------|------------------|---------|---------|------|---------|--|
| R101: VOLUME SUMMARY BY PRIMARY PRODUCT AND CONTRACT SPECIES |       |       |    |    |   |        |        |                              |                    |                  |         |         |      | PAGE 53 |  |
| FOR CUT TREES ONLY                                           |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| CRUISE#: 1 SALE#: 1                                          |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| SALENAME: French Gulch                                       |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| RUN DATE & TIME: 3/11/2014 12:54:55 PM                       |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| VERSION: DRAFT.2014                                          |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| VOLUME LIBRARY VERSION: 02.27.2014                           |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| ***** PRIMARY PRODUCT *****                                  |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| C                                                            |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| O                                                            |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| N                                                            |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| T                                                            |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| R                                                            | S     | P     |    |    |   | GROSS  | NET    | ***** CONTRACT SPECIES ***** |                    |                  |         |         |      |         |  |
|                                                              | P     | R     | U  | %  | % |        |        | 16'LOGS 16'LOGS              |                    |                  |         |         |      |         |  |
|                                                              | E     | O     |    |    |   | BDFT   | BDFT   |                              |                    |                  |         |         |      |         |  |
| S                                                            | C     | D     | O  | B  | C |        |        |                              |                    |                  |         |         |      |         |  |
| P                                                            | I     | U     | F  | D  | U | CUFT   | CUFT   | AVG                          | ** GROSS VOLUME ** | ** NET VOLUME ** | GROSS   | GROSS   |      |         |  |
| E                                                            | E     | C     |    | F  | F |        |        |                              |                    |                  |         |         |      |         |  |
| C                                                            | S     | T     | M  | T  | T | RATIO  | RATIO  | DBH                          | BDFT               | CUFT             | BDFT    | CUFT    | CCF  | MBF     |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| DF                                                           | 01    | 03    | 10 | 11 |   | 5.4099 | 5.4107 | 7.1                          | 386199             | 71388            | 345672  | 63887   | 20.7 | 38.3    |  |
| GF                                                           | 01    | 03    | 30 | 29 |   | 5.5446 | 5.4909 | 9.6                          | 1770680            | 319353           | 1243943 | 226544  | 17.1 | 30.8    |  |
| LP                                                           | 01    | 03    | 16 | 16 |   | 5.3664 | 5.3629 | 9.4                          | 1538038            | 286607           | 1294997 | 241473  | 22.2 | 41.3    |  |
| S                                                            | 01    | 03    | 5  | 6  |   | 5.2151 | 5.2220 | 9.9                          | 39326              | 7541             | 37165   | 7117    | 19.2 | 36.8    |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| PRODUCT                                                      | 01    | TOTAL | 22 | 21 |   | 5.4523 | 5.4205 | 9.1                          | 3734242            | 684889           | 2921777 | 539021  | 19.6 | 36.0    |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| DF                                                           | 08    | 03    | 29 | 30 |   | 5.4050 | 5.4542 | 17.2                         | 16493              | 3051             | 11653   | 2137    | 10.9 | 20.1    |  |
| GF                                                           | 08    | 03    | 26 | 26 |   | 5.3448 | 5.2865 | 10.5                         | 58012              | 10854            | 42697   | 8077    | 15.7 | 29.4    |  |
| LP                                                           | 08    | 03    | 8  | 8  |   | 5.4430 | 5.4475 | 10.1                         | 3765544            | 691817           | 3456371 | 634486  | 20.5 | 37.7    |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| PRODUCT                                                      | 08    | TOTAL | 9  | 9  |   | 5.4413 | 5.4455 | 10.1                         | 3840049            | 705723           | 3510721 | 644699  | 20.4 | 37.5    |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
| CONTR SPEC                                                   | TOTAL | 15    | 15 |    |   | 5.4467 | 5.4341 | 9.5                          | 7574291            | 1390611          | 6432498 | 1183720 | 20.0 | 36.7    |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
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|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |
|                                                              |       |       |    |    |   |        |        |                              |                    |                  |         |         |      |         |  |

## REPORT R103

|                                                                                                                                                                          |             |               |           |                |                      |                    |                |             |             |                    |                          |              |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|-----------|----------------|----------------------|--------------------|----------------|-------------|-------------|--------------------|--------------------------|--------------|---------|
| R103: SUMMARY BY LOGGING METHOD-CUT<br>FOR CUT TREES ONLY<br>-- CUBIC FOOT --<br>CRUISE#: 1 SALE#: 1<br>SALENAME: French Gulch<br>RUN DATE & TIME: 3/11/2014 12:54:55 PM |             |               |           |                |                      |                    |                |             |             |                    |                          |              | PAGE 55 |
| VERSION: DRAFT.2014<br>VOLUME LIBRARY VERSION: 02.27.2014                                                                                                                |             |               |           |                |                      |                    |                |             |             |                    |                          |              |         |
| L P<br>O R<br>G O<br>D<br>M U<br>T C<br>H T                                                                                                                              | GROSS<br>CF | TOTAL<br>DEF% | NET<br>CF | ESTIM<br>TREES | GROSS<br>CF/<br>ACRE | NET<br>CF/<br>ACRE | TREES/<br>ACRE | MEAN<br>DBH | MEAN<br>HGT | NET<br>CF/<br>TREE | 16'LOGS/<br>GROSS<br>CCF | AVG<br>SLOPE | ACRES   |
| 420 01 P                                                                                                                                                                 | 238271      | 20.6          | 189293    | 14438          | 2291                 | 1820               | 138.8          | 9.0         | 76.0        | 13                 | 20.1                     | 0.0          | 104.0   |
| 01 TOTAL                                                                                                                                                                 | 238271      | 20.6          | 189293    | 14438          | 2291                 | 1820               | 138.8          | 9.0         | 76.0        | 13                 | 20.1                     | 0.0          | 104.0   |
| 420 02 R                                                                                                                                                                 | 0           | 0.0           | 5716      | 0              | 0                    | 55                 | 0.0            | 0.0         | 0.0         | 0                  | 55.0                     | 0.0          | N/A     |
| 02 TOTAL                                                                                                                                                                 | 0           | 0.0           | 5716      | 0              | 0                    | 55                 | 0.0            | 0.0         | 0.0         | 0                  | 0.0                      | 0.0          | 104.0   |
| 420 08 P                                                                                                                                                                 | 252795      | 7.9           | 232848    | 12151          | 2431                 | 2239               | 116.8          | 10.0        | 81.1        | 19                 | 20.9                     | 0.0          | 104.0   |
| 420 08 R                                                                                                                                                                 | 0           | 0.0           | 443       | 0              | 0                    | 4                  | 0.0            | 0.0         | 0.0         | 0                  | 4.3                      | 0.0          | N/A     |
| 08 TOTAL                                                                                                                                                                 | 252795      | 7.7           | 233291    | 12151          | 2431                 | 2243               | 116.8          | 10.0        | 81.1        | 19                 | 20.9                     | 0.0          | 104.0   |

## REPORT R104

|                                                                                                                                                 |                 |          |                 |                    |               |            |               |  |  |  |  |  |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|-----------------|--------------------|---------------|------------|---------------|--|--|--|--|--|---------|
| R104: BASAL AREA PER UNIT<br>FOR CUT AND LEAVE TREES<br>CRUISE#: 1 SALE#: 1<br>SALENAME: French Gulch<br>RUN DATE & TIME: 3/11/2014 12:54:55 PM |                 |          |                 |                    |               |            |               |  |  |  |  |  | PAGE 57 |
| VERSION: DRAFT.2014<br>VOLUME LIBRARY VERSION: 02.27.2014                                                                                       |                 |          |                 |                    |               |            |               |  |  |  |  |  |         |
| STRATA                                                                                                                                          | CUTTING<br>UNIT | SPECIES  | SAMPLE<br>GROUP | PRIMARY<br>PRODUCT | CUT/<br>LEAVE | AVG<br>DBH | BASAL<br>AREA |  |  |  |  |  |         |
| SUBTOTAL                                                                                                                                        |                 |          |                 |                    | C             | 10.0       | 132.1         |  |  |  |  |  |         |
| UNIT                                                                                                                                            | 1               | SUBTOTAL |                 |                    |               | 10.0       | 132.1         |  |  |  |  |  |         |
| 2                                                                                                                                               | 5               | DF       |                 | 01                 | C             | 8.7        | 0.7           |  |  |  |  |  |         |
| 2                                                                                                                                               | 5               | GF       |                 | 01                 | C             | 8.2        | 21.4          |  |  |  |  |  |         |
| 2                                                                                                                                               | 5               | LP       |                 | 01                 | C             | 11.3       | 42.9          |  |  |  |  |  |         |
| 2                                                                                                                                               | 5               | LP       | PW              | 08                 | C             | 8.2        | 67.9          |  |  |  |  |  |         |
| SUBTOTAL                                                                                                                                        |                 |          |                 |                    | C             | 9.3        | 132.9         |  |  |  |  |  |         |
| UNIT                                                                                                                                            | 5               | SUBTOTAL |                 |                    |               | 9.3        | 132.9         |  |  |  |  |  |         |
| 2                                                                                                                                               | 9               | GF       |                 | 01                 | C             | 10.1       | 21.4          |  |  |  |  |  |         |
| 2                                                                                                                                               | 9               | LP       |                 | 01                 | C             | 9.0        | 42.9          |  |  |  |  |  |         |
| 2                                                                                                                                               | 9               | LP       | PW              | 08                 | C             | 11.0       | 67.9          |  |  |  |  |  |         |
| SUBTOTAL                                                                                                                                        |                 |          |                 |                    | C             | 10.0       | 132.1         |  |  |  |  |  |         |
| UNIT                                                                                                                                            | 9               | SUBTOTAL |                 |                    |               | 10.0       | 132.1         |  |  |  |  |  |         |
| 2                                                                                                                                               | 11              | GF       |                 | 01                 | C             | 9.5        | 21.4          |  |  |  |  |  |         |
| 2                                                                                                                                               | 11              | LP       |                 | 01                 | C             | 11.2       | 42.9          |  |  |  |  |  |         |
| 2                                                                                                                                               | 11              | LP       | PW              | 08                 | C             | 12.2       | 67.9          |  |  |  |  |  |         |
| SUBTOTAL                                                                                                                                        |                 |          |                 |                    | C             | 11.4       | 132.1         |  |  |  |  |  |         |

| <b>Region 2 Reports</b> |                                                                                                                                                                                                                                                                                                                                                 |                  |                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| <i>Report</i>           | <i>Description</i>                                                                                                                                                                                                                                                                                                                              | <i>Available</i> | <i>Modified</i> |
| R201                    | Trees per Acre and Net Cubic Volume – Displayed by species and stratum. Includes stratum, species, primary and secondary product, estimated number of trees, trees per acre, net cubic volume for primary and secondary product, net cubic volume per acre for primary and secondary product and stratum acres.                                 | ✓                |                 |
| R202                    | Percent Defect by Species -- by 1 inch diameter class, board foot volume, primary product only, and cut trees only.                                                                                                                                                                                                                             | ✓                |                 |
| R203                    | Same as R202 only reports in cubic feet.                                                                                                                                                                                                                                                                                                        | ✓                |                 |
| R204                    | Percent Defect by Species – by 2 inch diameter class, board foot volume, primary product only, and cut trees only.                                                                                                                                                                                                                              | ✓                |                 |
| R205                    | Same as R204 only reports in cubic feet.                                                                                                                                                                                                                                                                                                        | ✓                |                 |
| R206                    | QMD & Average DBH by Species and Contract Species – Primary Product Only – Cut Trees Only -- Reports net CUFT volume, BDFT/CUFT Ratio by contract species, QMD by contract species and average DBH by contract species                                                                                                                          | ✓                |                 |
| R207                    | Stewardship Product Summary – Stems Per Acre<br>For cut trees only<br>This report is broken down by cutting unit by stratum and displays the trees per acre and total stems for each species and product. The number of plots in the unit as well as the fixed plot size are also displayed. The average DRC is also shown if it was collected. | ✓                |                 |
| R208                    | Stewardship Average Product Cost<br>This report for cut trees only shows cutting unit, species and net cubic foot volume. It also shows the percent net volume, pounds per cubic foot, and weight fraction. The summary section includes the scaling defect percent, adjusted weight factor, pounds per CCF, tons per CCF and the cost per ton. | ✓                |                 |
|                         |                                                                                                                                                                                                                                                                                                                                                 |                  |                 |

## REPORT R201

| R201: TREES PER ACRE & NET CUBIC VOLUME<br>BY SPECIES AND STRATA<br>FOR CUT TREES ONLY<br>CRUISE#: 93002 SALE#: 93002<br>SALENAME: WHITE SWAN<br>RUN DATE & TIME: 08-11-2004 10:54:20 |         |                 |                   |              |                |                                  |          |                                    |          | PAGE 13                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------|-------------------|--------------|----------------|----------------------------------|----------|------------------------------------|----------|------------------------------------------------------------|
|                                                                                                                                                                                       |         |                 |                   |              |                |                                  |          |                                    |          | VERSION: 08.13.2004B<br>VOLUME LIBRARY VERSION: 07.29.2004 |
| STRATUM                                                                                                                                                                               | SPECIES | PRIMARY PRODUCT | SECONDARY PRODUCT | EST. # TREES | TREES PER ACRE | PRIMARY PRODUCT NET CUBIC VOLUME | PER ACRE | SECONDARY PRODUCT NET CUBIC VOLUME | PER ACRE | STRATUM ACRES                                              |
| 01                                                                                                                                                                                    | ES      | 01              | 02                | 10           | <1             | 218                              | 2        | 0                                  | 0        | 112                                                        |
|                                                                                                                                                                                       | LP      | 01              | 02                | 4477         | 40             | 39013                            | 348      | 0                                  | 0        |                                                            |
|                                                                                                                                                                                       | LPD     | 01              | 02                | 365          | 3              | 4300                             | 38       | 0                                  | 0        |                                                            |
|                                                                                                                                                                                       | LPP     | 02              | 02                | 16413        | 147            | 40485                            | 361      | 0                                  | 0        |                                                            |
|                                                                                                                                                                                       | TF      | 01              | 02                | 285          | 3              | 2471                             | 22       | 0                                  | 0        |                                                            |
| 01                                                                                                                                                                                    | TOTAL   |                 |                   | 21550        | 192            | 86487                            | 772      | 0                                  | 0        | 112                                                        |
| 02                                                                                                                                                                                    | LP      | 01              | 02                | 41446        | 193            | 372596                           | 1733     | 0                                  | 0        | 215                                                        |
|                                                                                                                                                                                       | LPD     | 01              | 02                | 405          | 2              | 3656                             | 17       | 0                                  | 0        |                                                            |
| 02                                                                                                                                                                                    | TOTAL   |                 |                   | 41852        | 195            | 376252                           | 1750     | 0                                  | 0        | 215                                                        |

## REPORT R206

| R206: QMD & AVE DBH BY SPECIES & CONTRACT SPECIES |         |                 |                              |                         |                             | PAGE 6                             |
|---------------------------------------------------|---------|-----------------|------------------------------|-------------------------|-----------------------------|------------------------------------|
| PRIMARY PRODUCT ONLY                              |         |                 |                              |                         |                             |                                    |
| FOR CUT TREES ONLY                                |         |                 |                              |                         |                             |                                    |
| CRUISE#: 25406                                    |         | SALE#: 25406    |                              |                         |                             |                                    |
| SALENAME: Green Creek 02                          |         |                 |                              |                         |                             | VERSION: 08.29.2006B               |
| RUN DATE & TIME: 09-06-2006 13:51:06              |         |                 |                              |                         |                             | VOLUME LIBRARY VERSION: 07.25.2006 |
| CONTRACT SPECIES                                  | SPECIES | NET CUFT VOLUME | BDFT/CUFT RATIO BY CONTR SPP | QMD BY CONTRACT SPECIES | AVG DBH BY CONTRACT SPECIES |                                    |
| DF                                                | DDF     | 67863           | 5.0177                       | 12.6                    | 12.3                        |                                    |
| DF                                                | DF      | 15124           | 4.1715                       | 10.3                    | 10.0                        |                                    |
| DF                                                | RDF     | 22618           | 4.3337                       | 10.3                    | 10.1                        |                                    |
| CONTRACT SPECIES DF                               | TOTAL   | 105604          | 4.8785                       | 11.5                    | 11.1                        |                                    |
| ES                                                | DES     | 2044            | 4.9934                       | 15.8                    | 15.7                        |                                    |
| CONTRACT SPECIES ES                               | TOTAL   | 2044            | 4.9934                       | 15.8                    | 15.7                        |                                    |
| LP                                                | DLP     | 192             | 3.9431                       | 12.8                    | 12.3                        |                                    |
| LP                                                | LP      | 1932            | 5.5352                       | 12.8                    | 12.7                        |                                    |
| LP                                                | RLP     | 5               | 3.4783                       | 7.7                     | 7.7                         |                                    |
| CONTRACT SPECIES LP                               | TOTAL   | 2129            | 4.6772                       | 12.7                    | 12.6                        |                                    |

## REPORT R207

R207: STEWARDSHIP PRODUCT SUMMARY - STEMS PER ACRE

PAGE 43

BY CUTTING UNIT BY STRATUM

FOR CUT TREES ONLY

CRUISE#: 71405 SALE#: 50211

SALENAME: LONG JOHN units 1-6

VERSION: DRAFT.2007

RUN DATE & TIME: 10-16-2007 10:30:55

VOLUME LIBRARY VERSION: 07.13.2007

| CUTTING<br>UNIT  | STRATUM | # OF<br>PLOTS | FIXED<br>PLOT<br>SIZE | SPECIES | PRODUCT | TOTAL<br>STEMS | TREES<br>PER<br>ACRE | AVG<br>DRC |
|------------------|---------|---------------|-----------------------|---------|---------|----------------|----------------------|------------|
| 1                | 2       | 0             | 0                     | PPP     | 14      | 240            | 11                   |            |
| 1                | 3       | 6             | 20                    | BSP     | 14      | 1              | 3                    |            |
| 1                | 3       | 6             | 20                    | PPP     | 14      | 16             | 53                   |            |
| PRODUCT SUBTOTAL |         |               |                       |         | 14      | 257            | 68                   |            |
| 1                | 4       | 6             | 50                    | BIO     | 20      | 7              | 58                   |            |
| PRODUCT SUBTOTAL |         |               |                       |         | 20      | 7              | 58                   |            |
| 2                | 2       | 0             | 0                     | PPP     | 14      | 621            | 7                    |            |
| 2                | 3       | 19            | 20                    | BSP     | 14      | 3              | 3                    |            |
| 2                | 3       | 19            | 20                    | DFP     | 14      | 5              | 5                    |            |
| 2                | 3       | 19            | 20                    | PPP     | 14      | 36             | 38                   |            |
| PRODUCT SUBTOTAL |         |               |                       |         | 14      | 665            | 53                   |            |
| 2                | 4       | 19            | 50                    | BIO     | 20      | 19             | 50                   |            |
| PRODUCT SUBTOTAL |         |               |                       |         | 20      | 19             | 50                   |            |
| 3                | 2       | 0             | 0                     | PPP     | 14      | 353            | 17                   |            |
| 3                | 3       | 5             | 20                    | PPP     | 14      | 11             | 44                   |            |
| PRODUCT SUBTOTAL |         |               |                       |         | 14      | 364            | 61                   |            |
| 3                | 4       | 5             | 50                    | BIO     | 20      | 4              | 40                   |            |

## Region 3 Reports

| Report | Description                                                                                                                                                                                                                                                                                                                                                                          | Available | Modified |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| R301   | A summary by species reporting: Sawtimber (Product '1') - Gross and net cubic foot and board foot volume, average defect (% cubic foot and % board foot), gross bdf to cuft ratio, quadratic mean dbh, total trees<br>Pulpwood (Product '2') - Total trees, gross and net cubic foot volume, average defect (% cubic foot), 4-6" top net sawtimber volume, total net pulpwood volume | ✓         |          |

### REPORT R301

| R301: REGION-3 SYNOPSIS              |         |               |      |     |       |         |       |       |       |         |               |     | PAGE 7                             |
|--------------------------------------|---------|---------------|------|-----|-------|---------|-------|-------|-------|---------|---------------|-----|------------------------------------|
| CRUISE#: 70211 SALE#: 70211          |         |               |      |     |       |         |       |       |       |         |               |     | VERSION: 04.03.2014B               |
| SALENAME: PIERCE                     |         |               |      |     |       |         |       |       |       |         |               |     | VOLUME LIBRARY VERSION: 03.31.2014 |
| RUN DATE & TIME: 5/7/2014 8:55:02 AM |         |               |      |     |       |         |       |       |       |         |               |     |                                    |
| CONT                                 |         | *****CCF***** |      |     |       | TOTAL   | AVE   | AVE   | QUAD  | RATIO   | *****MBF***** |     | CCF                                |
| SPEC                                 | PD SPEC | GROSS         | NET  | DEF | TREES | CF/TREE | GROSS | GROSS | MEAN  | MBF:CCF | GROSS         | NET | TOP                                |
| PP1                                  | 01 100  | 2522          | 2465 | 2.3 | 28591 | 9       | 402   | 10.4  | .4262 | 1075    | 1051          | 0   |                                    |
| PP                                   | 01 122  | 3909          | 3843 | 1.7 | 20156 | 19      | 622   | 13.6  | .4787 | 1871    | 1841          | 0   |                                    |
| DF                                   | 01 204  | 139           | 133  | 4.2 | 732   | 19      | 22    | 12.7  | .3921 | 55      | 52            | 0   |                                    |
| DF                                   | 02 NSAW | 60            | 60   | 0.0 | 1664  | 4       | 10    | 6.9   | .0000 | 0       | 0             | 0   |                                    |
| PP                                   | 02 NSAW | 1467          | 1466 | 0.0 | 37878 | 4       | 234   | 7.3   | .0000 | 0       | 0             | 0   |                                    |
| WP                                   | 02 NSAW | 0             | 0    | 0.0 | 1     | 4       | 0     | 8.6   | .0000 | 0       | 0             | 0   |                                    |
| TOTAL- NSAW                          |         | 1527          | 1526 | 0.0 | 39543 | 4       | 243   | 7.3   | .0000 | 0       | 0             | 0   |                                    |

## Region 4 Reports

| Report | Description                                                                                                                                                                                                                                                                                                                 | Available | Modified |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| R401   | Board Foot Summary by Species for Cut Trees and Primary Product Only Reports: Gross and net volume, average defect (%), estimated number of trees, gross board foot per acre, net board foot per acre, trees per acre, quadratic mean dbh, mean ht1, net board foot per tree, net 16' logs per MBF, and mean value per log. | ✓         |          |
| R402   | Identical to R401 except reports cubic foot volumes.                                                                                                                                                                                                                                                                        | ✓         |          |
| R403   | Board Foot Summary by Logging Method for Cut Trees and Primary Product Only Reports: Gross and net volume, average defect (%), estimated number of trees, gross board foot per acre, net board foot per acre, trees per acre, quadratic mean dbh, mean ht1, net board foot per tree, net 16' logs per MBF, and total acres. | ✓         |          |
| R404   | Identical to R403 except reports cubic foot volumes.                                                                                                                                                                                                                                                                        | ✓         |          |

### REPORT R402

|                                           |    |         |       |         |       |       |      |        |      |       |      |           |                                    |
|-------------------------------------------|----|---------|-------|---------|-------|-------|------|--------|------|-------|------|-----------|------------------------------------|
| R402: SALE APPRAISAL SUMMARY BY SPECIES   |    |         |       |         |       |       |      |        |      |       |      |           | PAGE 10                            |
| -- CUBIC FOOT --                          |    |         |       |         |       |       |      |        |      |       |      |           |                                    |
| FOR CUT TREES ONLY - PRIMARY PRODUCT ONLY |    |         |       |         |       |       |      |        |      |       |      |           |                                    |
| CRUISE#: 434 SALE#: 434                   |    |         |       |         |       |       |      |        |      |       |      |           | VERSION: DRAFT.2004B               |
| SALENAME: Lower Summit                    |    |         |       |         |       |       |      |        |      |       |      |           | VOLUME LIBRARY VERSION: 07.29.2004 |
| RUN DATE & TIME: 8- 4-2004 15: 4:40       |    |         |       |         |       |       |      |        |      |       |      |           |                                    |
| S                                         | P  |         |       |         |       |       |      |        |      |       |      |           |                                    |
| P                                         | R  |         |       |         |       |       |      |        |      |       |      |           |                                    |
| E                                         | O  |         |       |         |       |       |      |        |      |       |      |           |                                    |
| C                                         | D  |         |       |         |       |       |      |        |      |       |      |           |                                    |
| I                                         | U  |         |       |         |       |       |      |        |      |       |      |           |                                    |
| E                                         | C  | GROSS   | TOTAL | NET     | ESTIM | GROSS | NET  | TREES/ | QUAD | MEAN  | NET  | 16' LOGS/ | NET LOG                            |
| S                                         | T  | CF      | DEF%  | CF      | TREES | CF/   | CF/  | ACRE   | DBH  | HT1   | CF/  | GROSS     | SCALE                              |
|                                           |    |         |       |         |       |       |      |        |      |       | TREE | CCF       | VALUE/                             |
|                                           |    |         |       |         |       |       |      |        |      |       |      |           | CCF                                |
| DF                                        | 01 | 1116848 | 8.5   | 1021777 | 24591 | 2057  | 1882 | 45.3   | 12.1 | 74.1  | 42   | 12.9      |                                    |
| PP                                        | 01 | 136015  | 7.6   | 125620  | 1093  | 250   | 231  | 2.0    | 12.5 | 72.0  | 115  | 11.7      |                                    |
| WF                                        | 01 | 4668    | 16.0  | 3923    | 72    | 9     | 7    | 0.1    | 16.7 | 108.8 | 54   | 8.9       |                                    |
| TOTALS/AVE                                |    | 1257531 | 8.4   | 1151321 | 25756 | 2316  | 2120 | 47.4   | 12.2 | 74.0  | 45   | 12.8      | N/A                                |

### REPORT R404

|                                                |    |         |       |         |       |       |      |        |      |      |      |           |                                    |
|------------------------------------------------|----|---------|-------|---------|-------|-------|------|--------|------|------|------|-----------|------------------------------------|
| R404: SALE APPRAISAL SUMMARY BY LOGGING METHOD |    |         |       |         |       |       |      |        |      |      |      |           | PAGE 12                            |
| -- CUBIC FOOT --                               |    |         |       |         |       |       |      |        |      |      |      |           |                                    |
| FOR CUT TREES ONLY - PRIMARY PRODUCT ONLY      |    |         |       |         |       |       |      |        |      |      |      |           |                                    |
| CRUISE#: 434 SALE#: 434                        |    |         |       |         |       |       |      |        |      |      |      |           | VERSION: DRAFT.2004B               |
| SALENAME: Lower Summit                         |    |         |       |         |       |       |      |        |      |      |      |           | VOLUME LIBRARY VERSION: 07.29.2004 |
| RUN DATE & TIME: 8- 4-2004 15: 4:41            |    |         |       |         |       |       |      |        |      |      |      |           |                                    |
| L                                              | P  |         |       |         |       |       |      |        |      |      |      |           |                                    |
| O                                              | R  |         |       |         |       |       |      |        |      |      |      |           |                                    |
| C                                              | O  |         |       |         |       |       |      |        |      |      |      |           |                                    |
| D                                              |    |         |       |         |       |       |      |        |      |      |      |           |                                    |
| H                                              | U  |         |       |         |       |       |      |        |      |      |      |           |                                    |
| T                                              | C  | GROSS   | TOTAL | NET     | ESTIM | GROSS | NET  | TREES/ | QUAD | MEAN | NET  | 16' LOGS/ |                                    |
| H                                              | T  | CF      | DEF%  | CF      | TREES | CF/   | CF/  | ACRE   | DBH  | HT1  | CF/  | GROSS     | ACRES                              |
|                                                |    |         |       |         |       |       |      |        |      |      | TREE | CCF       |                                    |
| 420                                            | 01 | 1051423 | 8.5   | 962514  | 23777 | 2480  | 2270 | 56.1   | 0.0  | 0.0  | 40   | 12.8      | 424.0                              |
| 480                                            | 01 | 206108  | 8.4   | 188807  | 1979  | 1732  | 1587 | 16.6   | 0.0  | 0.0  | 95   | 12.8      | 119.0                              |
| TOTALS/AVE                                     |    | 1257531 | 8.4   | 1151321 | 25756 | 2316  | 2120 | 47.4   | 0.0  | 0.0  | 45   | 12.8      | 543.0                              |

## Region 5 Reports

| Report | Description                                                                                                                                                                                                                                                            | Available | Modified |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| R501   | Log Stock Table by Species and Product: Each table contains data for each species and product combination in the file. Data is displayed by log diameter class and includes number of logs, gross BDFT volume, net BDFT volume, gross CUFT volume and net CUFT volume. | ✓         |          |

### REPORT R501

| R501: LOG STOCK TABLE BY SPECIES AND PRODUCT<br>FOR CUT TREES ONLY<br>CRUISE#: 61855 SALE#: 61855<br>SALENAME: Mudflow<br>RUN DATE & TIME: 3/25/2014 1:18:50 PM |                 |               |             |               | PAGE 77<br>VERSION: DRAFT.2014<br>VOLUME LIBRARY VERSION: 02.27.2014 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|-------------|---------------|----------------------------------------------------------------------|
| TABLE 4 - REPORT FOR SPECIES: IC<br>PRODUCT: OS                                                                                                                 |                 |               |             |               |                                                                      |
| LOG<br>DIB<br>CLASS                                                                                                                                             | #<br>OF<br>LOGS | GROSS<br>BDFT | NET<br>BDFT | GROSS<br>CUFT | NET<br>CUFT                                                          |
| 1                                                                                                                                                               | 55239.6         | 0.0           | 0.0         | 23318.2       | 23318.2                                                              |
| 3                                                                                                                                                               | 16057.4         | 0.0           | 0.0         | 12540.2       | 12540.2                                                              |
| 4                                                                                                                                                               | 12424.7         | 0.0           | 0.0         | 22078.2       | 22078.2                                                              |
| 5                                                                                                                                                               | 12231.4         | 0.0           | 0.0         | 40477.9       | 40477.9                                                              |
| TOTALS                                                                                                                                                          | 95953.1         | 0.0           | 0.0         | 98414.5       | 98414.5                                                              |

## Region 6 Reports

| Report | Description                                                                                                                                                                                                                                                                                                                                                             | Available | Modified |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| R602   | Volume by Species and Product within Payment and Cutting Unit across Strata – For cut trees only. Displays payment unit, cutting unit, cutting unit acres, species, product, unit of measure, % defect, and net volume CCF.                                                                                                                                             | ✓         |          |
| R604   | Product Volume Summary – Log Stock Table for cut trees only. Displays a single page for each species and separates volume by log DIB 1” diameter class and then shows gross volume, net volume and % defect for saw timber and non-saw timber. Shows cull logs total volume, total gross volume, and total net volume in separate columns. Volumes are reported as CCF. | ✓         |          |
| R605   | Product Volume Summary – Log Stock Table for cut trees only. Displays same information as R604 only volumes are reported as MBF.                                                                                                                                                                                                                                        | ✓         |          |
|        |                                                                                                                                                                                                                                                                                                                                                                         |           |          |

## REPORT R602

|                                          |  |  |  |              |  |  |  |                                    |
|------------------------------------------|--|--|--|--------------|--|--|--|------------------------------------|
| R602: VOLUME BY SPECIES & PRODUCT WITHIN |  |  |  |              |  |  |  | PAGE 27                            |
| PAYMENT AND CUTTING UNIT ACROSS STRATA   |  |  |  |              |  |  |  |                                    |
| FOR CUT TREES ONLY                       |  |  |  |              |  |  |  |                                    |
| CRUISE#: 44444                           |  |  |  | SALE#: 44444 |  |  |  |                                    |
| SALENAME: STR EXAMPLE                    |  |  |  |              |  |  |  | VERSION: 08.13.2004B               |
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## REPORT R604

|                                      |  |            |            |              |                |      |                |           |              |                                    |  |
|--------------------------------------|--|------------|------------|--------------|----------------|------|----------------|-----------|--------------|------------------------------------|--|
| R604: PRODUCT VOLUME SUMMARY         |  |            |            |              |                |      |                |           |              | PAGE 28                            |  |
| LOG STOCK TABLE FOR CUT TREES ONLY   |  |            |            |              |                |      |                |           |              |                                    |  |
| ***** CCF *****                      |  |            |            |              |                |      |                |           |              |                                    |  |
| CRUISE#: 44444                       |  |            |            | SALE#: 44444 |                |      |                |           |              |                                    |  |
| SALENAME: STR EXAMPLE                |  |            |            |              |                |      |                |           |              | VERSION: 08.13.2004B               |  |
| RUN DATE & TIME: 08-11-2004 12:34:02 |  |            |            |              |                |      |                |           |              | VOLUME LIBRARY VERSION: 07.29.2004 |  |
| TABLE 1                              |  |            |            |              |                |      |                |           |              |                                    |  |
| REPORT FOR SPECIES: DF               |  |            |            |              |                |      |                |           |              |                                    |  |
| AVERAGE DBH: 10.5"                   |  |            |            |              |                |      |                |           |              |                                    |  |
| LOG DIB                              |  | SAW TIMBER |            |              | NON-SAW TIMBER |      |                | CULL LOG  | TOTAL        | TOTAL                              |  |
| SMALL END                            |  | *****      | PRODUCT 01 | *****        | PRODUCT 08=FS  | **   | PRODUCT 02=BLM | (GRADE 9) | (01+08+9)    | (01+08)                            |  |
| 1" DIA. CLASS                        |  | GROSS      | NET        | % DEFECT     | GROSS          | NET  | % DEFECT       | VOLUME    | GROSS VOLUME | NET VOLUME                         |  |
| 2                                    |  | 0.00       | 0.00       | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 0.00         | 0.00                               |  |
| 3                                    |  | 0.00       | 0.00       | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 0.00         | 0.00                               |  |
| 4                                    |  | 183.68     | 183.68     | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 183.68       | 183.68                             |  |
| 5                                    |  | 163.44     | 163.44     | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 163.44       | 163.44                             |  |
| 6                                    |  | 59.32      | 59.32      | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 59.32        | 59.32                              |  |
| 7                                    |  | 190.21     | 190.21     | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 190.21       | 190.21                             |  |
| 8                                    |  | 150.36     | 150.36     | 0.0          | 0.00           | 0.00 | 0.0            | 0.00      | 150.36       | 150.36                             |  |
| 9                                    |  | 34.38      | 34.38      | 0.0          | 0.30           | 0.03 | 90.6           | 0.00      | 34.67        | 34.41                              |  |

| <b>BLM Reports</b>                                                                   |                                                                                                                                                                                                                                                                                                                                                                  |                  |                 |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| <b>NOTE: All reports create a comma-delimited text file with an extension of CSV</b> |                                                                                                                                                                                                                                                                                                                                                                  |                  |                 |
| <i>Report</i>                                                                        | <i>Description</i>                                                                                                                                                                                                                                                                                                                                               | <i>Available</i> | <i>Modified</i> |
| BLM01                                                                                | Board Foot Summary by Strata for Cut Trees Only Reports: Quad mean dbh, average gross merch log volume, total net volume, total gross merch volume, total gross volume, recovery, salvage, total number of merch logs, total number of cull logs, total number of merch trees, number of acres, average volume per acre, and percent of gross volume cut. (R701) | ✓                |                 |
| BLM02                                                                                | Identical to BLM01 except reports cubic foot volumes. (R702)                                                                                                                                                                                                                                                                                                     | ✓                |                 |
| BLM03                                                                                | Board Foot Summary by Unit for Cut Trees Only Reports: Quad mean dbh, average gross merch log volume, total net volume, total gross merch volume, total gross volume, recovery, salvage, total number of merch logs, total number of cull logs, total number of merch trees, number of acres, average volume per acre, and percent of gross volume cut. (R703)   | ✓                |                 |
| BLM04                                                                                | Identical to BLM03 except reports cubic foot volumes. (R704)                                                                                                                                                                                                                                                                                                     | ✓                |                 |
| BLM05                                                                                | Board Foot Summary by Species for Cut Trees Only Reports: Quad mean dbh, average gross merch log volume, total net volume, total gross merch volume, total gross volume, recovery, salvage, total number of merch logs, total number of cull logs, and percent volume by grade. (R705)                                                                           | ✓                |                 |
| BLM06                                                                                | Identical to BLM05 except reports cubic foot volumes. (R706)                                                                                                                                                                                                                                                                                                     | ✓                |                 |
| BLM07                                                                                | Board Foot Summary by Unit and Species for Cut Trees Only Reports: Quad mean dbh, average gross merch log volume, total net volume, total gross merch volume, total gross volume, recovery, salvage, total number of merch logs, total number of cull logs, and percent volume by grade. (R707)                                                                  | ✓                |                 |
| BLM08                                                                                | Identical to BLM07 except reports cubic foot volumes. (R708)                                                                                                                                                                                                                                                                                                     | ✓                |                 |
| BLM09                                                                                | Log grade by diameter class by species: Displays log grades 0 through 9 along with net volume, defect volume, gross merchantable volume and gross volume by 1" log diameter classes for each species. (R709)                                                                                                                                                     | ✓                |                 |
| BLM10                                                                                | Identical to BLM09 except reports cubic foot volumes. (R710)                                                                                                                                                                                                                                                                                                     | ✓                |                 |
|                                                                                      |                                                                                                                                                                                                                                                                                                                                                                  |                  |                 |

## REPORT BLM02

| BLM02: CUBIC FOOT STRATA SUMMARY (R702) |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              | PAGE 2                             |
|-----------------------------------------|-------------------------------|-----------------------------------|----------------------------------|------------------------------------|---------------------------|--------------|-------------|------------------------------|------------------------------|--------------------------|------------------------------|---------------|--------------|------------------------------------|
| FOR CUT TREES ONLY                      |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              |                                    |
| VOLUMES BASED ON 16 FOOT EQUATIONS      |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              |                                    |
| CRUISE#: 800 SALE#: 800                 |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              |                                    |
| SALENAME: Long Nine                     |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 2:21:47 PM  |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              | VOLUME LIBRARY VERSION: 09.23.2013 |
| STRATA<br>NUMBER                        | QUAD<br>MEAN<br>DBH<br>(INCH) | AVG GM<br>LOG<br>VOLUME<br>(CUFT) | TOTAL<br>NET<br>VOLUME<br>(CUFT) | GROSS<br>MERCH<br>VOLUME<br>(CUFT) | GROSS<br>VOLUME<br>(CUFT) | RCVRY<br>(%) | SLVG<br>(%) | GROSS<br>VOLUME<br>(GRADE 7) | GROSS<br>VOLUME<br>(GRADE 8) | TOTAL #<br>MERCH<br>LOGS | TOTAL #<br>LOGS<br>(GRD 7-9) | NUM<br>TREES* | NUM<br>ACRES | AVG VOL<br>/ ACRE<br>(CUFT)        |
| 1                                       | 33.1                          | 48                                | 49714                            | 54040                              | 64472                     | 77           | 0           | 0                            | 0                            | 1116                     | 193                          | 181           | 15           | 3314                               |
| 10                                      | 26.3                          | 547                               | 241134                           | 262100                             | 271920                    | 89           | 0           | 0                            | 0                            | 479                      | 533                          | 1466          | 20           | 12057                              |
| 2                                       | 38.5                          | 72                                | 36695                            | 41012                              | 50064                     | 73           | 0           | 0                            | 0                            | 566                      | 161                          | 96            | 10           | 3670                               |
| 3                                       | 17.6                          | 18                                | 147814                           | 160860                             | 183414                    | 81           | 0           | 0                            | 0                            | 8940                     | 306                          | 2285          | 60           | 2464                               |
| 4                                       | 15.4                          | 630                               | 181311                           | 198064                             | 198064                    | 92           | 0           | 0                            | 0                            | 315                      | 0                            | 3896          | 60           | 3022                               |
| 5                                       | 12.3                          | 463                               | 226389                           | 246500                             | 246500                    | 92           | 0           | 0                            | 0                            | 533                      | 0                            | 8417          | 60           | 3773                               |
| 6                                       | 24.2                          | 1423                              | 448717                           | 487961                             | 493723                    | 91           | 0           | 0                            | 0                            | 343                      | 422                          | 2971          | 60           | 7479                               |
| 7                                       | 14.7                          | 10                                | 97729                            | 106277                             | 106277                    | 92           | 0           | 0                            | 0                            | 10439                    | 0                            | 2338          | 60           | 1629                               |
| 8                                       | 15.1                          | 11                                | 106749                           | 116076                             | 116076                    | 92           | 0           | 0                            | 0                            | 10956                    | 0                            | 2477          | 60           | 1779                               |
| 9                                       | 13.1                          | 9                                 | 32309                            | 34347                              | 34347                     | 94           | 0           | 0                            | 0                            | 3946                     | 0                            | 973           | 60           | 538                                |
| TOTALS-                                 | 17.0                          | 45                                | 1568562                          | 1707236                            | 1764855                   | 89           | 0           | 0                            | 0                            | 37632                    | 1615                         | 25100         | 465          | 3373                               |

## REPORT BLM04

| BLM04: CUBIC FOOT UNIT SUMMARY (R704)  |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              | PAGE 3                             |
|----------------------------------------|-------------------------------|-----------------------------------|----------------------------------|------------------------------------|---------------------------|--------------|-------------|------------------------------|------------------------------|--------------------------|------------------------------|---------------|--------------|------------------------------------|
| FOR CUT TREES ONLY                     |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              |                                    |
| VOLUMES BASED ON 16 FOOT EQUATIONS     |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              |                                    |
| CRUISE#: 800 SALE#: 800                |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              |                                    |
| SALENAME: Long Nine                    |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 2:21:47 PM |                               |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |               |              | VOLUME LIBRARY VERSION: 09.23.2013 |
| UNIT<br>NUMBER                         | QUAD<br>MEAN<br>DBH<br>(INCH) | AVG GM<br>LOG<br>VOLUME<br>(CUFT) | TOTAL<br>NET<br>VOLUME<br>(CUFT) | GROSS<br>MERCH<br>VOLUME<br>(CUFT) | GROSS<br>VOLUME<br>(CUFT) | RCVRY<br>(%) | SLVG<br>(%) | GROSS<br>VOLUME<br>(GRADE 7) | GROSS<br>VOLUME<br>(GRADE 8) | TOTAL #<br>MERCH<br>LOGS | TOTAL #<br>LOGS<br>(GRD 7-9) | NUM<br>TREES* | NUM<br>ACRES | AVG VOL<br>/ ACRE<br>(CUFT)        |
| 1                                      | 46.2                          | 71                                | 35107                            | 39162                              | 48132                     | 73           | 0           | 0                            | 0                            | 537                      | 165                          | 93            | 10           | 3511                               |
| 1A                                     | 47.5                          | 27                                | 14608                            | 15878                              | 16340                     | 89           | 0           | 0                            | 0                            | 579                      | 28                           | 88            | 5            | 2922                               |
| 2                                      | 38.5                          | 72                                | 36695                            | 41012                              | 50064                     | 73           | 0           | 0                            | 0                            | 566                      | 161                          | 96            | 10           | 3670                               |
| 3                                      | 17.6                          | 18                                | 147814                           | 160860                             | 183414                    | 81           | 0           | 0                            | 0                            | 8940                     | 306                          | 2284          | 60           | 2464                               |
| 4                                      | 15.4                          | 10                                | 181311                           | 198064                             | 198064                    | 92           | 0           | 0                            | 0                            | 18874                    | 0                            | 3896          | 60           | 3022                               |
| 5                                      | 12.3                          | 8                                 | 226389                           | 246500                             | 246500                    | 92           | 0           | 0                            | 0                            | 31967                    | 0                            | 8417          | 60           | 3773                               |
| 6                                      | 24.2                          | 24                                | 448717                           | 487961                             | 493723                    | 91           | 0           | 0                            | 0                            | 20581                    | 422                          | 2971          | 60           | 7479                               |
| 7                                      | 14.7                          | 10                                | 97729                            | 106277                             | 106277                    | 92           | 0           | 0                            | 0                            | 10439                    | 0                            | 2338          | 60           | 1629                               |
| 8                                      | 14.6                          | 10                                | 139058                           | 150423                             | 150423                    | 92           | 0           | 0                            | 0                            | 14902                    | 0                            | 3450          | 60           | 2318                               |
| 9                                      | 26.3                          | 27                                | 241134                           | 262100                             | 271920                    | 89           | 0           | 0                            | 0                            | 9580                     | 533                          | 1466          | 20           | 12057                              |
| TOTALS-                                | 17.2                          | 15                                | 1568562                          | 1707236                            | 1764855                   | 89           | 0           | 0                            | 0                            | 116964                   | 1615                         | 25099         | 405          | 3873                               |

## REPORT BLM06

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| BLM06: CUBIC FOOT SPECIES SUMMARY (R706) |  |  |  |  |  |  |  |  |  |  |  |  |  | PAGE 4 |  |  |  |  |
| FOR CUT TREES ONLY                       |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |
| VOLUMES BASED ON 16 FOOT EQUATIONS       |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |
| CRUISE#: 800 SALE#: 800                  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |
| SALENAME: Long Nine                      |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |
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## REPORT BLM08

| BLM08: CUBIC FOOT UNIT AND SPECIES SUMMARY (R708) |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          | PAGE 5                       |                      |
|---------------------------------------------------|-----------|-----------------------|-----------------------------------|----------------------------------|------------------------------------|---------------------------|--------------|-------------|------------------------------|------------------------------|--------------------------|------------------------------|----------------------|
| FOR CUT TREES ONLY                                |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| VOLUMES BASED ON 16 FOOT EQUATIONS                |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| CRUISE#: 800 SALE#: 800                           |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| SALENAME: Long Nine                               |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| RUN DATE & TIME: 12/12/2013 2:21:47 PM            |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| VERSION: DRAFT.2013                               |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| VOLUME LIBRARY VERSION: 09.23.2013                |           |                       |                                   |                                  |                                    |                           |              |             |                              |                              |                          |                              |                      |
| UNIT<br>NUMBER                                    | SPECIES   | QUAD<br>DBH<br>(INCH) | AVG CM<br>LOG<br>VOLUME<br>(CUFT) | TOTAL<br>NET<br>VOLUME<br>(CUFT) | GROSS<br>MERCH<br>VOLUME<br>(CUFT) | GROSS<br>VOLUME<br>(CUFT) | RCVRY<br>(%) | SLVG<br>(%) | GROSS<br>VOLUME<br>(GRADE 7) | GROSS<br>VOLUME<br>(GRADE 8) | TOTAL #<br>MERCH<br>LOGS | TOTAL #<br>LOGS<br>(GRD 7-9) | EST.<br>NO.<br>TREES |
| 1                                                 | 202B02    | 72.3                  | 121                               | 28242                            | 30699                              | 39707                     | 71           | 0           | 0                            | 0                            | 254                      | 145                          | 32                   |
| 1                                                 | 263B00    | 22.7                  | 26                                | 6865                             | 7463                               | 8425                      | 81           | 0           | 0                            | 0                            | 283                      | 20                           | 61                   |
| UNIT                                              | 1 TOTALS  | 46.2                  | 71                                | 35107                            | 38162                              | 48132                     | 73           | 0           | 0                            | 0                            | 537                      | 165                          | 93                   |
| 1A                                                | 202B02    | 46.3                  | 28                                | 14380                            | 15630                              | 16092                     | 89           | 0           | 0                            | 0                            | 555                      | 28                           | 78                   |
| 1A                                                | 263B00    | 55.9                  | 10                                | 228                              | 248                                | 248                       | 92           | 0           | 0                            | 0                            | 24                       | 0                            | 10                   |
| UNIT                                              | 1A TOTALS | 47.5                  | 27                                | 14608                            | 15878                              | 16340                     | 89           | 0           | 0                            | 0                            | 579                      | 28                           | 88                   |
| 2                                                 | 202B02    | 58.2                  | 121                               | 29730                            | 33356                              | 41430                     | 72           | 0           | 0                            | 0                            | 275                      | 140                          | 33                   |
| 2                                                 | 263B00    | 22.0                  | 26                                | 6965                             | 7656                               | 8634                      | 81           | 0           | 0                            | 0                            | 291                      | 21                           | 63                   |

## REPORT BLM10

|                                                                 |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
|-----------------------------------------------------------------|-------|------|-----------|---|------|-----|-----------|--------|--------|-------|-------|-------|------|--------|--|
| BLM10: CUBIC FOOT LOG GRADE -- DIAMETER CLASS BY SPECIES (R710) |       |      |           |   |      |     |           |        |        |       |       |       |      | PAGE 7 |  |
| FOR CUT TREES ONLY                                              |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| CRUISE#: 800 SALE#: 800                                         |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| SALENAME: Long Nine                                             |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| RUN DATE & TIME: 12/12/2013 2:21:47 PM                          |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| VERSION: DRAFT.2013                                             |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| VOLUME LIBRARY VERSION: 09.23.2013                              |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| SPECIES: 202B02                                                 |       |      |           |   |      |     |           |        |        |       |       |       |      |        |  |
| DIB                                                             | L O G |      | G R A D E |   |      |     | LOG GRADE |        | HD/VIS | GRADE |       | GROSS |      |        |  |
| CLASS                                                           |       |      |           |   |      |     | NET       |        | DEFECT | GROSS | GRADE | GROSS |      |        |  |
| 1"                                                              | 0     | 1    | 2         | 3 | 4    | 5   | 6         | VOLUME | 7      | 8     | (1-8) | MERCH | 9    | VOLUME |  |
| 40                                                              | 441   | 442  | 306       | 0 | 2337 | 0   | 0         | 3526   | 0      | 0     | 340   | 3866  | 1103 | 4968   |  |
| 41                                                              | 596   | 708  | 1033      | 0 | 1191 | 298 | 0         | 3825   | 0      | 0     | 370   | 4195  | 643  | 4837   |  |
| 42                                                              | 297   | 1487 | 0         | 0 | 864  | 0   | 0         | 2648   | 0      | 0     | 319   | 2967  | 323  | 3290   |  |
| 43                                                              | 156   | 759  | 0         | 0 | 315  | 0   | 0         | 1229   | 0      | 0     | 107   | 1336  | 0    | 1336   |  |
| 44                                                              | 488   | 2448 | 511       | 0 | 1659 | 0   | 0         | 5106   | 0      | 0     | 476   | 5583  | 1090 | 6673   |  |
| 45                                                              | 514   | 1917 | 0         | 0 | 518  | 348 | 0         | 3296   | 0      | 0     | 287   | 3583  | 0    | 3583   |  |
| 46                                                              | 174   | 1186 | 0         | 0 | 723  | 0   | 0         | 2083   | 0      | 0     | 181   | 2264  | 189  | 2453   |  |
| 47                                                              | 761   | 2874 | 0         | 0 | 0    | 0   | 0         | 2635   | 0      | 0     | 241   | 2877  | 0    | 2877   |  |

## Region 8 Reports

| Report | Description                                                                                                                                                                        | Available | Modified |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| R801   | Estimated Sale Volume and Number of Trees.<br>Reports: MBF and CCF by 2 inch DBH class for<br>softwood sawtimber, hardwood sawtimber, softwood<br>pulpwood, and hardwood pulpwood. | ✓         |          |
| R802   | Estimated Sale Volume and Number of Trees.<br>Reports: Estimated number of trees, MBF, CCF,<br>Topwood CCF by Sample Group and Specie.                                             | ✓         |          |

### REPORT R801

Top of report

| REPORT R801: SALE SUMMARY           |                    |         |        |                    |        |       |                    |        |                    | PAGE 22                            |
|-------------------------------------|--------------------|---------|--------|--------------------|--------|-------|--------------------|--------|--------------------|------------------------------------|
| BY 2" DIAMETER CLASSES              |                    |         |        |                    |        |       |                    |        |                    |                                    |
| FOR CUT TREES ONLY                  |                    |         |        |                    |        |       |                    |        |                    |                                    |
| CRUISE#: 33333 SALE#: 33333         |                    |         |        |                    |        |       |                    |        |                    | VERSION: DRAFT.2004B               |
| SALENAME: R8 Vol Check 081199       |                    |         |        |                    |        |       |                    |        |                    | VOLUME LIBRARY VERSION: 07.29.2004 |
| RUN DATE & TIME: 8- 4-2004 16:18:35 |                    |         |        |                    |        |       |                    |        |                    |                                    |
| SALE CUT ACRES: 245.00              |                    |         |        |                    |        |       |                    |        |                    |                                    |
| DBH                                 | EST. #<br>OF TREES | MBF     | CCF    | EST. #<br>OF TREES | MBF    | CCF   | EST. #<br>OF TREES | CCF    | EST. #<br>OF TREES | CCF                                |
| 4                                   | 0                  | 0.000   | 0.00   | 0                  | 0.000  | 0.00  | 4199               | 98.83  | 1                  | 0.01                               |
| 6                                   | 0                  | 0.000   | 0.00   | 0                  | 0.000  | 0.00  | 1038               | 30.24  | 133                | 3.85                               |
| 8                                   | 0                  | 0.000   | 0.00   | 0                  | 0.000  | 0.00  | 1238               | 97.08  | 574                | 32.16                              |
| 10                                  | 10                 | 0.563   | 0.97   | 0                  | 0.000  | 0.00  | 3953               | 444.68 | 220                | 19.14                              |
| 12                                  | 236                | 24.491  | 40.07  | 374                | 33.274 | 50.99 | 175                | 32.72  | 0                  | 0.00                               |
| 14                                  | 19                 | 3.429   | 5.99   | 83                 | 14.448 | 23.12 | 0                  | 0.00   | 0                  | 0.00                               |
| 16                                  | 538                | 107.566 | 167.97 | 71                 | 20.594 | 30.38 | 0                  | 0.00   | 0                  | 0.00                               |
| 18                                  | 15                 | 5.339   | 7.85   | 55                 | 20.252 | 27.08 | 0                  | 0.00   | 0                  | 0.00                               |
| 20                                  | 5                  | 2.458   | 3.90   | 16                 | 5.815  | 8.59  | 0                  | 0.00   | 0                  | 0.00                               |
| 22                                  | 294                | 188.418 | 252.76 | 21                 | 11.186 | 15.92 | 0                  | 0.00   | 0                  | 0.00                               |
| 24                                  | 10                 | 7.483   | 11.41  | 18                 | 14.006 | 16.93 | 0                  | 0.00   | 0                  | 0.00                               |
| 26                                  | 670                | 616.042 | 823.26 | 68                 | 59.577 | 60.14 | 0                  | 0.00   | 0                  | 0.00                               |
| 28                                  | 9                  | 12.144  | 16.97  | 11                 | 12.382 | 14.58 | 0                  | 0.00   | 0                  | 0.00                               |
| 30                                  | 0                  | 0.000   | 0.00   | 16                 | 22.106 | 24.61 | 0                  | 0.00   | 0                  | 0.00                               |
| 32                                  | 9                  | 16.829  | 10.99  | 16                 | 26.316 | 33.58 | 0                  | 0.00   | 0                  | 0.00                               |
| 34                                  | 0                  | 0.000   | 0.00   | 7                  | 12.639 | 14.54 | 0                  | 0.00   | 0                  | 0.00                               |

Bottom of report

|                     |      |          |         |      |         |           |          |                           |              |                      |
|---------------------|------|----------|---------|------|---------|-----------|----------|---------------------------|--------------|----------------------|
| 50                  | 1    | 5.069    | 5.38    | 0    | 0.000   | 0.00      | 0        | 0.00                      | 0            | 0.00                 |
| 52                  | 0    | 0.000    | 0.00    | 0    | 0.000   | 0.00      | 0        | 0.00                      | 0            | 0.00                 |
| 54                  | 0    | 0.000    | 0.00    | 0    | 0.000   | 0.00      | 0        | 0.00                      | 0            | 0.00                 |
| 56                  | 4    | 22.734   | 0.24    | 4    | 16.693  | 15.35     | 0        | 0.00                      | 0            | 0.00                 |
| 58                  | 0    | 0.000    | 0.00    | 0    | 0.000   | 0.00      | 0        | 0.00                      | 0            | 0.00                 |
| 60                  | 2    | 16.832   | 14.09   | 0    | 0.000   | 0.00      | 0        | 0.00                      | 0            | 0.00                 |
| TOTAL:              | 1944 | 1244.669 | 1646.98 | 785  | 344.066 | 419.37    | 10603    | 703.55                    | 929          | 55.17                |
|                     |      |          |         |      |         |           |          | TOPWOOD:                  | 102.22       | 49.38                |
|                     |      |          |         |      |         |           |          | TOTAL TOPWOOD & PULPWOOD: | 805.77       | 104.54               |
|                     |      |          |         |      |         |           |          |                           |              | ***** PER/ACRE ***** |
|                     |      | AVG      | AVG     | AVG  | AVG     | AVG UPPER | EST. #   |                           |              |                      |
|                     |      | BF/TREE  | CF/TREE | DBH  | SWT HT  | STEM HT   | OF TREES | MBF                       | CCF          |                      |
| PINE SAWTIMBER:     |      | 640.     | 84.7    | 21.7 | 55.4    | 64.2      | 7.9      | 5.08                      | 6.72         |                      |
| HARDWOOD SAWTIMBER: |      | 438.     | 53.4    | 17.3 | 42.5    | 45.6      | 3.2      | 1.40                      | 1.71         |                      |
| PINE PULPWOOD:      |      |          | 6.6     | 7.0  |         | 35.6      | 43.3     |                           | 2.87 (W/TOP) |                      |
| HARDWOOD PULPWOOD:  |      |          | 5.9     | 8.6  |         | 28.6      | 3.8      |                           | 0.23 (W/TOP) |                      |
| TOTAL/AVERAGE:      |      | 111.     | 19.8    | 9.7  | 9.9     | 39.6      | 58.2     | 6.48                      | 11.53        |                      |

## REPORT R802

|                                                                |         |                 |        |                                    |             |         |
|----------------------------------------------------------------|---------|-----------------|--------|------------------------------------|-------------|---------|
| R802: SALE SUMMARY - ESTIMATED SALE VOLUME AND NUMBER OF TREES |         |                 |        |                                    |             | PAGE 23 |
| BY SAMPLE GROUP, SPECIES, AND PRODUCT                          |         |                 |        |                                    |             |         |
| FOR CUT TREES ONLY                                             |         |                 |        |                                    |             |         |
| CRUISE#: 33333                                                 |         | SALE#: 33333    |        |                                    |             |         |
| SALENAME: R8 Vol Check 081199                                  |         |                 |        | VERSION: DRAFT.2004B               |             |         |
| RUN DATE & TIME: 8- 4-2004 16:18:35                            |         |                 |        | VOLUME LIBRARY VERSION: 07.29.2004 |             |         |
| ***** SAWTIMBER *****                                          |         |                 |        |                                    |             |         |
| SAMPLE GROUP                                                   | SPECIES | EST. # OF TREES | MBF    | CCF                                | TOPWOOD CCF |         |
| <hr/>                                                          |         |                 |        |                                    |             |         |
| HS                                                             |         |                 |        |                                    |             |         |
|                                                                | 602     | 93              | 23.665 | 25.23                              | 4.98        |         |
| HS TOTAL:                                                      |         | 93              | 23.665 | 25.23                              | 4.98        |         |
| <br>                                                           |         |                 |        |                                    |             |         |
| LG                                                             |         |                 |        |                                    |             |         |
|                                                                | 762     | 3               | 3.837  | 4.45                               | 0.08        |         |
|                                                                | 806     | 39              | 22.427 | 17.40                              | 1.98        |         |
|                                                                | 833     | 22              | 2.689  | 4.32                               | 1.14        |         |
|                                                                | 837     | 4               | 2.004  | 3.06                               | 0.32        |         |
|                                                                | 950     | 25              | 5.841  | 8.01                               | 1.56        |         |
|                                                                | 970     | 3               | 4.647  | 3.82                               | 0.43        |         |
| LG                                                             |         | 0               | 0.000  | 0.00                               | 0.00        |         |
| LG TOTAL:                                                      |         | 95              | 41.445 | 41.08                              | 5.53        |         |
| <br>                                                           |         |                 |        |                                    |             |         |
| MH                                                             |         |                 |        |                                    |             |         |
|                                                                | 316     | 70              | 15.519 | 25.42                              | 3.30        |         |
|                                                                | 310     | 25              | 15.929 | 25.42                              | 3.30        |         |

|                                                                |           |              |        |  |                                    |
|----------------------------------------------------------------|-----------|--------------|--------|--|------------------------------------|
| R802: SALE SUMMARY - ESTIMATED SALE VOLUME AND NUMBER OF TREES |           |              |        |  | PAGE 24                            |
| BY SAMPLE GROUP, SPECIES, AND PRODUCT                          |           |              |        |  |                                    |
| FOR CUT TREES ONLY                                             |           |              |        |  |                                    |
| CRUISE#: 33333                                                 |           | SALE#: 33333 |        |  |                                    |
| SALENAME: R8 Vol Check 081199                                  |           |              |        |  | VERSION: DRAFT.2004B               |
| RUN DATE & TIME: 8- 4-2004 16:18:35                            |           |              |        |  | VOLUME LIBRARY VERSION: 07.29.2004 |
| ***** PULPWOOD *****                                           |           |              |        |  |                                    |
| SAMPLE                                                         |           | EST. #       |        |  |                                    |
| GROUP                                                          | SPECIES   | OF TREES     | CCF    |  |                                    |
| <hr/>                                                          |           |              |        |  |                                    |
| ZH                                                             |           |              |        |  |                                    |
|                                                                | 300       | 133          | 10.23  |  |                                    |
|                                                                | 500       | 266          | 17.13  |  |                                    |
|                                                                | 800       | 530          | 27.81  |  |                                    |
|                                                                | ZH        | 0            | 0.00   |  |                                    |
|                                                                | ZH TOTAL: | 929          | 55.17  |  |                                    |
| ZP                                                             |           |              |        |  |                                    |
|                                                                | 100       | 9806         | 640.25 |  |                                    |
|                                                                | 131       | 627          | 60.94  |  |                                    |
|                                                                | 132       | 169          | 2.37   |  |                                    |
|                                                                | ZP        | 0            | 0.00   |  |                                    |
|                                                                | ZP TOTAL: | 10603        | 703.55 |  |                                    |
| PULPWOOD TOTAL:                                                |           | 11531        | 758.72 |  |                                    |

| SC Reports-- Stem Count Reports |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |          |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| Report                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Available | Modified |
| SC1                             | Stem Count per Acre by Unit by Species (FIXCNT method only). Primary product only. By 1-inch diameter classes. Report shows piece count for each species by diameter class. A row total and column total are also displayed. If DBH is not collected, no DIB classes are displayed and all values accumulate under a "zero" DIB class (see second example below).                                                                                                               | ✓         |          |
| SC2                             | Stem Count by Unit by Stratum by Species (FIXCNT method only). Primary product only. By 1-inch diameter classes. Report shows actual tally count for each species by diameter class. A row total and column total are included. If DBH is not collected, no DIB classes are displayed and all values accumulate under a "zero" DIB class. Usually, one unit/stratum combination is displayed per page. The format of the report is similar to the examples shown below for SC1. | ✓         |          |
| SC3                             | Stem Count per Acre by Stratum by Species (FIXCNT method only). Primary product only. By 1-inch diameter classes. Report is similar to the first two and has the same format.                                                                                                                                                                                                                                                                                                   | ✓         |          |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |          |

## REPORT SC2

|                                                                                |       |      |       |      |        |                                    |
|--------------------------------------------------------------------------------|-------|------|-------|------|--------|------------------------------------|
| SC2: STEM COUNT (TALLY) BY UNIT BY STRATUM BY SPECIES (FIXCNT METHOD ONLY)     |       |      |       |      |        | PAGE 18                            |
| FOR PRIMARY PRODUCT ONLY -- BY 1" DIAMETER CLASS                               |       |      |       |      |        |                                    |
| (5-inch class = 4.6 - 5.5 inches; 9-inch class = 8.6 - 9.5 inches, and so on.) |       |      |       |      |        |                                    |
| CRUISE#: 60111 SALE#: 60111                                                    |       |      |       |      |        |                                    |
| SALENAME: EAGARSOUTH_PHONELINE                                                 |       |      |       |      |        | VERSION: 04.03.2014B               |
| RUN DATE & TIME: 5/7/2014 9:14:23 AM                                           |       |      |       |      |        | VOLUME LIBRARY VERSION: 03.31.2014 |
| CUTTING UNIT: 29 STRATUM: 2 NUMBER OF PLOTS -- 4                               |       |      |       |      |        |                                    |
| SPECIES                                                                        | DF    | PP   | WF    | WP   | TOTALS |                                    |
| 0                                                                              | 47.0  | 5.2  | 83.5  | 10.4 | 146.1  |                                    |
| 1                                                                              | 52.2  | 0.0  | 73.1  | 0.0  | 125.2  |                                    |
| 2                                                                              | 67.8  | 0.0  | 52.2  | 15.6 | 135.7  |                                    |
| 3                                                                              | 57.4  | 10.5 | 26.1  | 0.0  | 93.9   |                                    |
| 4                                                                              | 41.8  | 0.0  | 52.2  | 5.2  | 99.2   |                                    |
| TOTALS                                                                         | 266.2 | 15.7 | 287.0 | 31.3 | 600.1  |                                    |

## ST REPORTS -- Statistics For Sample Populations (For Cut Trees Only)

Statistical information is displayed by the following: Strata, product, unit of measure, and/or sample group, sure to measure and stage sample 1/2.

| Report | Description                                                                                                                                                                                                                                                                                        | Available | Modified |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| ST1    | Statistics for Sample Group: Net volume - Number of sample trees, mean X, sum of X, sum of (X*X), standard deviation, coefficient of variation, standard error, sampling error and combined sampling error. Primary, secondary, and recovered product information shown on separate pages. (DP1)   | ✓         |          |
| ST2    | Statistics for Sample Group: Gross volume – Number of sample trees, mean X, sum of X, sum of (X*X), standard deviation, coefficient of variation, standard error, sampling error and combined sampling error. Primary, secondary, and recovered product information shown on separate pages. (DP2) | ✓         |          |
| ST3    | Error Term, Volume and Confidence Interval: Gross and Net Volume – volume, error and interval. Primary, secondary, and recovered product information shown on separate pages. (DS1)                                                                                                                | ✓         |          |
| ST4    | Error Term, Volume and Confidence Interval: Value - value, error, and confidence interval. Primary, secondary, and recovered product information shown on separate pages. (DS2)                                                                                                                    | ✓         |          |

## REPORT ST1

|                                                   |    |    |   |    |           |     |       |       |      |        |         |           |           |                   |                                    |
|---------------------------------------------------|----|----|---|----|-----------|-----|-------|-------|------|--------|---------|-----------|-----------|-------------------|------------------------------------|
| ST1: NET VOLUME STATISTICS FOR SAMPLE GROUP (DP1) |    |    |   |    |           |     |       |       |      |        |         |           |           |                   | PAGE 3                             |
| FOR CUT TREES ONLY                                |    |    |   |    |           |     |       |       |      |        |         |           |           |                   |                                    |
| CRUISE#: 20002 SALE#: 20002                       |    |    |   |    |           |     |       |       |      |        |         |           |           |                   |                                    |
| SALENAME: R2 Test                                 |    |    |   |    |           |     |       |       |      |        |         |           |           |                   | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 2:41:46 PM            |    |    |   |    |           |     |       |       |      |        |         |           |           |                   | VOLUME LIBRARY VERSION: 09.23.2013 |
| S<br>T<br>G *****PRIMARY PRODUCT NET VOLUME ***** |    |    |   |    |           |     |       |       |      |        |         |           |           |                   |                                    |
| P                                                 | S  | S  |   |    |           |     |       |       |      |        |         |           |           |                   |                                    |
| R                                                 | U  | A  |   |    |           |     |       |       |      |        |         |           |           |                   |                                    |
| T                                                 | O  | M  | S | NO |           |     |       |       |      |        |         |           |           |                   |                                    |
| R                                                 | D  | O  | A |    |           |     |       |       |      |        |         |           |           |                   |                                    |
| A                                                 | U  | G  | S | M  | SAM       | BIG | SMALL | t     | MEAN | SUM    | SUM     | COEFF     |           | COMBINED          |                                    |
| T                                                 | C  | R  | T |    |           |     |       |       |      | OF     | OF      | STANDARD  | OF        | STANDARD SAMPLING |                                    |
| A                                                 | T  | M  | P | M  | 1/2 TREES | N   | N     | VALUE | X    | X      | (X * X) | DEVIATION | VARIATION | ERROR             | ERROR                              |
| 1                                                 | 01 | 03 | N | 1  | 16        | 16  | 16    | 2.131 | 14.2 | 227.30 | 5827.65 | 13.1620   | 92.6493   | 0.000             | 0.0000                             |
| 10                                                | 01 | 03 | N | 1  | 30        | 0   | 7     | 2.447 | 4.3  | 30.00  | 130.00  | 0.4880    | 11.3855   | 0.184             | 10.5302                            |
| 10                                                | 01 | 03 | N | 2  | 17        | 7   | 17    | 2.120 | 21.6 | 367.57 | 8325.27 | 4.8591    | 22.4731   | 1.178             | 11.5551                            |
| 11                                                | 14 | 03 | N | 1  | 43        | 0   | 10    | 2.262 | 4.3  | 43.00  | 189.00  | 0.6749    | 15.6965   | 0.213             | 11.2278                            |
| 11                                                | 14 | 03 | N | 2  | 21        | 10  | 21    | 2.086 | 12.3 | 259.00 | 3689.84 | 4.9775    | 40.3580   | 1.086             | 18.3710                            |
| 2                                                 | 01 | 03 | E | N  | 1         | 7   | 107   | 2.447 | 0.6  | 4.14   | 3.02    | 0.3078    | 51.9915   | 0.116             | 48.0859                            |
| 2                                                 | 01 | 03 | P | N  | 1         | 4   | 223   | 3.182 | 0.5  | 2.13   | 1.23    | 0.1811    | 34.0324   | 0.091             | 54.1456                            |
| 2                                                 | 01 | 03 | T | U  | 1         | 3   | 113   | 2.447 | 0.3  | 5.33   | 5.15    | 0.4204    | 55.5553   | 0.163             | 53.4034                            |

# REPORT ST3

| ST3: ERROR TERM, VOLUME AND CONFIDENCE INTERVAL (DS1) |    |    |          |       |        |        |          |       |        |
|-------------------------------------------------------|----|----|----------|-------|--------|--------|----------|-------|--------|
| PRIMARY PRODUCT VOLUME                                |    |    |          |       |        |        |          |       |        |
| FOR CUT TREES ONLY                                    |    |    |          |       |        |        |          |       |        |
| CRUISE#: 20002 SALE#: 20002                           |    |    |          |       |        |        |          |       |        |
| SALENAME: R2 Test                                     |    |    |          |       |        |        |          |       |        |
| RUN DATE & TIME: 12/12/2013 2:41:46 PM                |    |    |          |       |        |        |          |       |        |
| VERSION: DRAFT.2013                                   |    |    |          |       |        |        |          |       |        |
| VOLUME LIBRARY VERSION: 09.23.2013                    |    |    |          |       |        |        |          |       |        |
| P ***** PRIMARY PRODUCT GROSS VOLUME *****            |    |    |          |       |        |        |          |       |        |
| S R U ***** PRIMARY PRODUCT NET VOLUME *****          |    |    |          |       |        |        |          |       |        |
| T O ***** 95% CONFIDENCE *****                        |    |    |          |       |        |        |          |       |        |
| R D O ***** 95% CONFIDENCE *****                      |    |    |          |       |        |        |          |       |        |
| A U F INTERVAL                                        |    |    |          |       |        |        |          |       |        |
| T C INTERVAL                                          |    |    |          |       |        |        |          |       |        |
| A T M VOLUME* ERROR FROM TO VOLUME* ERROR FROM TO     |    |    |          |       |        |        |          |       |        |
| 1                                                     | 01 | 03 | 239.3    | 0.00  | 239    | 239    | 227.3    | 0.00  | 227    |
| 10                                                    | 01 | 03 | 35074.6  | 15.66 | 29580  | 40569  | 33358.1  | 15.63 | 28143  |
| 11                                                    | 14 | 03 | 5024.6   | 21.52 | 3943   | 6106   | 4773.9   | 21.53 | 3746   |
| 2                                                     | 01 | 03 | 1734.6   | 30.23 | 1210   | 2259   | 1655.2   | 30.22 | 1155   |
| 3                                                     | 14 | 03 | 144123.1 | 14.78 | 122818 | 165428 | 136964.9 | 14.76 | 116742 |
| 4                                                     | 01 | 03 | 9355.5   | 34.03 | 6172   | 12539  | 8921.6   | 34.00 | 5888   |
| 5                                                     | 01 | 03 | 9126.5   | 23.36 | 6994   | 11259  | 8717.4   | 23.36 | 6681   |
| 6                                                     | 01 | 03 | 33687.4  | 30.22 | 23509  | 43866  | 32114.3  | 30.18 | 22423  |
| 7                                                     | 01 | 03 | 44000.2  | 22.88 | 33934  | 54066  | 41914.4  | 22.87 | 32331  |
| 8                                                     | 01 | 03 | 12347.8  | 22.32 | 9592   | 15104  | 11795.1  | 22.34 | 9160   |
| 9                                                     | 01 | 03 | 31979.9  | 17.71 | 26316  | 37644  | 30511.3  | 17.71 | 25107  |
| ----- AGGREGATED BY PRODUCT -----                     |    |    |          |       |        |        |          |       |        |
| 01                                                    | 03 |    | 177545.8 | 9.59  | 160524 | 194568 | 169214.7 | 9.58  | 153006 |
| 14                                                    | 03 |    | 149147.6 | 14.30 | 127815 | 170480 | 141738.8 | 14.29 | 121490 |
| ----- AGGREGATED BY UNIT OF MEASURE -----             |    |    |          |       |        |        |          |       |        |
| 03                                                    |    |    | 326693.5 | 8.35  | 299402 | 353985 | 310953.5 | 8.34  | 285017 |
| ----- AGGREGATED BY STRATA -----                      |    |    |          |       |        |        |          |       |        |
| 1                                                     | 03 |    | 239.3    | 0.00  | 239    | 239    | 227.3    | 0.00  | 227    |
| 10                                                    | 03 |    | 35074.6  | 15.66 | 29580  | 40569  | 33358.1  | 15.63 | 28143  |
| 11                                                    | 03 |    | 5024.6   | 21.52 | 3943   | 6106   | 4773.9   | 21.53 | 3746   |
| 2                                                     | 03 |    | 1734.6   | 30.23 | 1210   | 2259   | 1655.2   | 30.22 | 1155   |
| 3                                                     | 03 |    | 144123.1 | 14.78 | 122818 | 165428 | 136964.9 | 14.76 | 116742 |
| 4                                                     | 03 |    | 9355.5   | 34.03 | 6172   | 12539  | 8921.6   | 34.00 | 5888   |
| 5                                                     | 03 |    | 9126.5   | 23.36 | 6994   | 11259  | 8717.4   | 23.36 | 6681   |
| 6                                                     | 03 |    | 33687.4  | 30.22 | 23509  | 43866  | 32114.3  | 30.18 | 22423  |

## TC REPORTS -- Stand Table Reports

These reports are for cut trees only and are grouped into 1" and 2" diameter classes. TC1 to TC28 -- Information Displayed (for Cut Trees Only) by Species, Product, Unit of Measure, and 2" Diameter Classes. The Diameter Range is from 4 to 96 Inches.

| Report | Description                                                                                       | Available | Modified |
|--------|---------------------------------------------------------------------------------------------------|-----------|----------|
| TC1    | Gross board foot primary product volume by species, product and unit of measure for each stratum. | ✓         |          |
| TC2    | Net board foot primary product volume by species, product and unit of measure for each stratum.   | ✓         |          |
| TC3    | Gross cubic foot primary product volume by species, product and unit of measure for each stratum. | ✓         |          |
| TC4    | Net cubic foot primary product volume by species, product and unit of measure for each stratum.   | ✓         |          |
| TC5    | Cord wood primary product volume by species, product and unit of measure for each stratum.        |           |          |
| TC6    | Number of trees by species, product and unit of measure for each stratum.                         | ✓         |          |
| TC7    | Gross board foot primary product volume by species, product and unit of measure for the sale.     |           |          |
| TC8    | Net board foot primary product volume by species, product and unit of measure for the sale.       | ✓         |          |
| TC9    | Gross cubic foot primary product volume by species, product and unit of measure for the sale.     |           |          |
| TC10   | Net cubic foot primary product volume by species, product and unit of measure for the sale.       | ✓         |          |
| TC11   | Cord wood primary product volume by species, product and unit of measure for the sale.            |           |          |
| TC12   | Number of trees by species, product and unit of measure for the sale.                             | ✓         |          |
| TC13   | Gross board foot primary and secondary product volume by species for each stratum.                |           |          |
| TC14   | Net board foot primary and secondary product volume by species for each stratum.                  |           |          |
| TC15   | Gross cubic foot primary and secondary product volume by species for each stratum.                |           |          |
| TC16   | Net cubic foot primary and secondary product volume by species for each stratum.                  |           |          |

## TC REPORTS -- Stand Table Reports

These reports are for cut trees only and are grouped into 1" and 2" diameter classes. TC1 to TC28 -- Information Displayed (for Cut Trees Only) by Species, Product, Unit of Measure, and 2" Diameter Classes. The Diameter Range is from 4 to 96 Inches.

| Report | Description                                                                    | Available | Modified |
|--------|--------------------------------------------------------------------------------|-----------|----------|
| TC17   | Cord wood primary and secondary product volume by species for each stratum.    |           |          |
| TC18   | Number of trees by species for each stratum.                                   |           |          |
| TC19   | Gross board foot primary and secondary product volume by species for the sale. | ✓         |          |
| TC20   | Net board foot primary and secondary product volume by species for the sale.   | ✓         |          |
| TC21   | Gross cubic foot primary and secondary product volume by species for the sale. | ✓         |          |
| TC22   | Net cubic foot primary and secondary product volume by species for the sale.   | ✓         |          |
| TC23   | Cord wood primary and secondary product volume by species for the sale.        |           |          |
| TC24   | Number of trees by species for the sale.                                       | ✓         |          |
| TC25   | Expansion factors by specie, product, and unit of measure for each stratum.    |           |          |
| TC26   | Expansion factors by specie, product, and unit of measure for each sale.       |           |          |
| TC27   | Expansion factors by species for each stratum.                                 |           |          |
| TC28   | Expansion factors by species for each sale.                                    |           |          |
|        |                                                                                |           |          |

TC51 to TC78 -- The TC' Reports 'TC51-TC78' are identical to the 'TC1-TC28' reports except they show counts and volumes by 1" diameter classes from 3 to maximum DBH in inches.

These TC reports are also available --

TC51, TC52, TC53, TC54, TC56, TC57, TC58, TC59, TC60, TC62, TC65, TC71, TC72, TC74

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**TL REPORTS -- Stand Table Reports**

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These reports are for leave trees only and are grouped into 1" and 2" diameter classes.

| <i>Report</i> | <i>Description</i>                                                                                | <i>Available</i> | <i>Modified</i> |
|---------------|---------------------------------------------------------------------------------------------------|------------------|-----------------|
| TL1           | Gross board foot primary product volume by species, product and unit of measure for each stratum. |                  |                 |
| TL2           | Net board foot primary product volume by species, product and unit of measure for each stratum.   | ✓                |                 |
| TL3           | Gross cubic foot primary product volume by species, product and unit of measure for each stratum. |                  |                 |
| TL4           | Net cubic foot primary product volume by species, product and unit of measure for each stratum.   |                  |                 |
| TL5           | Cord wood primary product volume by species, product and unit of measure for each stratum.        |                  |                 |
| TL6           | Number of trees by species, product and unit of measure for each stratum.                         | ✓                |                 |
| TL7           | Gross board foot primary product volume by species, product and unit of measure for the sale.     | ✓                |                 |
| TL8           | Net board foot primary product volume by species, product and unit of measure for the sale.       | ✓                |                 |
| TL9           | Gross cubic foot primary product volume by species, product and unit of measure for the sale.     | ✓                |                 |
| TL10          | Net cubic foot primary product volume by species, product and unit of measure for the sale.       | ✓                |                 |
| TL11          | Cord wood primary product volume by species, product and unit of measure for the sale.            |                  |                 |
| TL12          | Number of trees by species, product and unit of measure for the sale.                             | ✓                |                 |
| TL13          | Gross board foot primary and secondary product volume by species for each stratum.                |                  |                 |
| TL14          | Net board foot primary and secondary product volume by species for each stratum.                  |                  |                 |
| TL15          | Gross cubic foot primary and secondary product volume by species for each stratum.                |                  |                 |
| TL16          | Net cubic foot primary and secondary product volume by species for each stratum.                  |                  |                 |
| TL17          | Cord wood primary and secondary product volume by species for each stratum.                       |                  |                 |
| TL18          | Number of trees by species for each stratum.                                                      |                  |                 |

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**TL REPORTS -- Stand Table Reports**

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These reports are for leave trees only and are grouped into 1” and 2” diameter classes.

| <i>Report</i> | <i>Description</i>                                                             | <i>Available</i> | <i>Modified</i> |
|---------------|--------------------------------------------------------------------------------|------------------|-----------------|
| TL19          | Gross board foot primary and secondary product volume by species for the sale. |                  |                 |
| TL20          | Net board foot primary and secondary product volume by species for the sale.   |                  |                 |
| TL21          | Gross cubic foot primary and secondary product volume by species for the sale. |                  |                 |
| TL22          | Net cubic foot primary and secondary product volume by species for the sale.   |                  |                 |
| TL23          | Cord wood primary and secondary product volume by species for the sale.        |                  |                 |
| TL24          | Number of trees by species for the sale.                                       |                  |                 |
| TL25          | Expansion factors by specie, product, and unit of measure for each stratum.    |                  |                 |
| TL26          | Expansion factors by specie, product, and unit of measure for each sale.       |                  |                 |
| TL27          | Expansion factors by species for each stratum.                                 |                  |                 |
| TL28          | Expansion factors by species for each sale.                                    |                  |                 |
|               |                                                                                |                  |                 |

TL51 to TL78 -- The ‘TL’ Reports ‘TL51-TL78’ are identical to the ‘TC1-TC28’ reports except they show counts and volumes for leave trees by 1” diameter classes from 3 to maximum DBH in inches.

These TL reports are also available –  
TL52, TL54, TL56, TL58, TL59, TL60, TL62

# REPORT TC1

|                                                                                      |  |       |  |       |                                    |
|--------------------------------------------------------------------------------------|--|-------|--|-------|------------------------------------|
| TC1: STAND TABLE FOR STRATA 1 -- GROSS BDFT VOLUME                                   |  |       |  |       | PAGE 68                            |
| FOR PRIMARY PRODUCT ONLY - BY 2" DIAMETER CLASS                                      |  |       |  |       |                                    |
| (12-inch class = 11.0 - 12.9 inches; 14-inch class = 13.0 - 14.9 inches, and so on.) |  |       |  |       |                                    |
| CRUISE#: 777 SALE#: 777                                                              |  |       |  |       |                                    |
| SALENAME: PSTESTER                                                                   |  |       |  |       | VERSION: 08.13.2004B               |
| RUN DATE & TIME: 08-11-2004 14:04:43                                                 |  |       |  |       | VOLUME LIBRARY VERSION: 07.29.2004 |
| SPEC                                                                                 |  | PP    |  | WF    |                                    |
| PROD                                                                                 |  | 01    |  | 01    |                                    |
| U OF M                                                                               |  | 03    |  | 03    | TOTALS                             |
| 1-4                                                                                  |  | 0     |  | 0     | 0                                  |
| 6                                                                                    |  | 0     |  | 0     | 0                                  |
| 8                                                                                    |  | 0     |  | 0     | 0                                  |
| 10                                                                                   |  | 0     |  | 429   | 429                                |
| 12                                                                                   |  | 572   |  | 1286  | 1858                               |
| 14                                                                                   |  | 2144  |  | 0     | 2144                               |
| 16                                                                                   |  | 1715  |  | 2715  | 4430                               |
| 18                                                                                   |  | 3573  |  | 3001  | 6573                               |
| 20                                                                                   |  | 5430  |  | 0     | 5430                               |
| 22                                                                                   |  | 0     |  | 7431  | 7431                               |
| TOTALS                                                                               |  | 13433 |  | 14862 | 28294                              |

## UC REPORTS -- Unit Level Reports

Volumes, Number of Trees, Average Defect and Bdft to Cuft Ratios by Species or Sample Group Within Cutting Units (All volumes are prorated on a percentage basis). All values are for cut trees only.

| Report | Description                                                                                                                                                                                                                                                                            | Available | Modified |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| UC1    | Per Unit Volume – Main Stem: gross and net board foot, cubic foot, and cords volume, average % defect, gross and net board foot to cubic foot ratios and estimated number of trees. By stratum, unit, species, product and unit of measure.                                            | ✓         |          |
| UC2    | Per Unit Volume – Primary Product: gross and net board foot, cubic foot, and cords volume, average % defect, gross and net board foot to cubic foot ratios and estimated number of trees. By stratum, unit, sample group, product and unit of measure.                                 | ✓         |          |
| UC3    | Per Unit Volume – Sawtimber and pulpwood: gross and net board foot, cubic foot, and cords volume, and estimated number of trees. By stratum, unit, and species. Any recovered volume in the cruise is included with net secondary volume and noted with an “R”.                        | ✓         |          |
| UC4    | Per Unit Volume – Sawtimber and pulpwood: gross and net board foot, cubic foot, and cords volume, and estimated number of trees. By stratum, unit, and sample group. Any recovered volume in the cruise is included with net secondary volume and noted with an “R”.                   | ✓         |          |
| UC5    | Per Unit Volume – Sawtimber and pulpwood: gross and net board foot, cubic foot, and cords volume, and estimated number of trees. By unit number across all strata and by species. Any recovered volume in the cruise is included with net secondary volume and noted with an “R”.      | ✓         |          |
| UC6    | Per Unit Volume – Sawtimber and pulpwood: gross and net board foot, cubic foot, and cords volume, and estimated number of trees. By unit number across all strata and by sample group. Any recovered volume in the cruise is included with net secondary volume and noted with an “R”. | ✓         |          |
| UC7    | Gross board foot sawtimber (Prod 01) primary product volume by unit number across all strata and by species.                                                                                                                                                                           | ✓         |          |
| UC8    | Net board foot sawtimber (Prod 01) primary product                                                                                                                                                                                                                                     | ✓         |          |

## UC REPORTS -- Unit Level Reports

Volumes, Number of Trees, Average Defect and Bdft to Cuft Ratios by Species or Sample Group Within Cutting Units (All volumes are prorated on a percentage basis). All values are for cut trees only.

| Report | Description                                                                                                  | Available | Modified |
|--------|--------------------------------------------------------------------------------------------------------------|-----------|----------|
|        | volume by unit number across all strata and by species.                                                      |           |          |
| UC9    | Gross cubic foot sawtimber (Prod 01) primary product volume by unit number across all strata and by species. | ✓         |          |
| UC10   | Net cubic foot sawtimber (Prod 01) primary product volume by unit number across all strata and by species.   | ✓         |          |
| UC11   | Estimated number of sawtimber (Prod 01) trees by unit number across all strata and by species.               | ✓         |          |
| UC12   | Gross cubic foot pulpwood (Prod 02 and topwood) volume by unit number across all strata and by species.      | ✓         |          |
| UC13   | Net cubic foot pulpwood (Prod 02 and topwood) volume by unit number across all strata and by species.        | ✓         |          |
| UC14   | Cord wood pulpwood (Prod 02 and topwood) volume by unit number across all strata and by species.             | ✓         |          |
| UC15   | Estimated number of sawtimber and pulpwood trees by unit number across all strata and by species.            | ✓         |          |
| UC16   | Same as UC7 except by sample group instead of species.                                                       | ✓         |          |
| UC17   | Same as UC8 except by sample group instead of species.                                                       | ✓         |          |
| UC18   | Same as UC9 except by sample group instead of species.                                                       | ✓         |          |
| UC19   | Same as UC10 except by sample group instead of species.                                                      | ✓         |          |
| UC20   | Same as UC11 except by sample group instead of species.                                                      | ✓         |          |
| UC21   | Same as UC12 except by sample group instead of species.                                                      | ✓         |          |
| UC22   | Same as UC13 except by sample group instead of species.                                                      | ✓         |          |
| UC23   | Same as UC14 except by sample group instead of species.                                                      | ✓         |          |
| UC24   | Same as UC15 except by sample group instead of species.                                                      | ✓         |          |
| UC25   | Volume Summary by Contract Species & Product                                                                 | ✓         |          |

Volumes, Number of Trees, Average Defect and Bdft to Cuft Ratios by Species or Sample Group Within Cutting Units (All volumes are prorated on a percentage basis). All values are for cut trees only.

# REPORT UC1

Cruise Processing User's Guide 10.12.2018

## REPORT UC3

|                                                               |  |  |  |  |  |  |  |  |  |  |  |  |         |
|---------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|---------|
| UC3: VOLUME BY SPECIES WITHIN CUTTING UNIT FOR EACH STRATUM * |  |  |  |  |  |  |  |  |  |  |  |  | PAGE 76 |
| FOR CUT TREES ONLY                                            |  |  |  |  |  |  |  |  |  |  |  |  |         |
| CRUISE#: 77777      SALES: 77777                              |  |  |  |  |  |  |  |  |  |  |  |  |         |
| SALENAME: PNT EXAMPLE (7.13)                                  |  |  |  |  |  |  |  |  |  |  |  |  |         |
| RUN DATE & TIME: 02-29-2008      13:23:53                     |  |  |  |  |  |  |  |  |  |  |  |  |         |
| VERSION: 03.07.2008                                           |  |  |  |  |  |  |  |  |  |  |  |  |         |
| VOLUME LIBRARY VERSION: 10.18.2007                            |  |  |  |  |  |  |  |  |  |  |  |  |         |
| ***** SAWTIMBER *****                                         |  |  |  |  |  |  |  |  |  |  |  |  |         |
| (PROD = 01    UM = 01, 03)                                    |  |  |  |  |  |  |  |  |  |  |  |  |         |
| ***** NON-SAWTIMBER *****                                     |  |  |  |  |  |  |  |  |  |  |  |  |         |
| (PROD NOT = 01    UM = 01, 02, 03)                            |  |  |  |  |  |  |  |  |  |  |  |  |         |
| (AND ALL SECONDARY & RECOVERED PRODUCT VOLUMES)               |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
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| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
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| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
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| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
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| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |
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| *** GROSS ***      *** NET ***                                |  |  |  |  |  |  |  |  |  |  |  |  |         |

## REPORT UC25

| UC25: VOLUME BY CONTRACT SPECIES & PRODUCT |                      |       |                     |                  | PAGE 7                             |
|--------------------------------------------|----------------------|-------|---------------------|------------------|------------------------------------|
| WITHIN PAYMENT UNITS ACROSS STRATA         |                      |       |                     |                  |                                    |
| FOR CUT TREES ONLY                         |                      |       |                     |                  |                                    |
| CRUISE#: 98765 SALE#: 98765                |                      |       |                     |                  |                                    |
| SALENAME: TIM Volume Summary               |                      |       |                     |                  | VERSION: 08.13.2004B               |
| RUN DATE & TIME: 08-12-2004 14:51:30       |                      |       |                     |                  | VOLUME LIBRARY VERSION: 07.29.2004 |
|                                            | PAYMENT<br>UNIT      | ACRES | CONTRACT<br>SPECIES | SANTIMBER<br>CCF | NON-SANTIMBER<br>CCF               |
|                                            | 1                    |       | DF                  | 395              | 46                                 |
|                                            |                      |       | WF                  | 133              | 22                                 |
|                                            |                      |       |                     |                  |                                    |
|                                            | PAYMENT UNIT 1 TOTAL | 26    | ALL                 | 528              | 68                                 |
|                                            | 2                    |       | LP                  | 1387             | 458                                |
|                                            |                      |       | WF                  | 79               | 4                                  |
|                                            |                      |       |                     |                  |                                    |
|                                            | PAYMENT UNIT 2 TOTAL | 45    | ALL                 | 1466             | 462                                |
| CONTRACT SPECIES SUMMARY                   |                      |       |                     |                  |                                    |
|                                            |                      |       | DF                  | 395              |                                    |
|                                            |                      |       | LP                  | 1387             |                                    |
|                                            |                      |       | WF                  | 212              |                                    |
|                                            |                      |       | NS                  | ---              | 530                                |
|                                            |                      |       |                     |                  |                                    |
| GRAND TOTALS                               | ALL                  | 71    | ALL                 | 1994             | 530                                |

## REPORT UC26

| UC26: VOLUME SUMMARY BY CONTRACT SPECIES & PRODUCT |                 |       |                     |                  | PAGE 8                             |
|----------------------------------------------------|-----------------|-------|---------------------|------------------|------------------------------------|
| BY CUTTING UNIT FOR THE SALE                       |                 |       |                     |                  |                                    |
| FOR CUT TREES ONLY                                 |                 |       |                     |                  |                                    |
| CRUISE#: 98765 SALE#: 98765                        |                 |       |                     |                  |                                    |
| SALENAME: TIM Volume Summary                       |                 |       |                     |                  | VERSION: 08.13.2004B               |
| RUN DATE & TIME: 08-12-2004 14:51:30               |                 |       |                     |                  | VOLUME LIBRARY VERSION: 07.29.2004 |
|                                                    | CUTTING<br>UNIT | ACRES | CONTRACT<br>SPECIES | SANTIMBER<br>CCF | NON-SANTIMBER<br>CCF               |
|                                                    | 1A              | 5     | DF                  | 75.95            | 8.89                               |
|                                                    | 1A              |       | WF                  | 25.62            | 4.16                               |
|                                                    |                 |       |                     |                  |                                    |
|                                                    | 1B              | 7     | DF                  | 106.33           | 12.45                              |
|                                                    | 1B              |       | WF                  | 35.87            | 5.83                               |
|                                                    |                 |       |                     |                  |                                    |
|                                                    | 1C              | 14    | DF                  | 212.66           | 24.90                              |
|                                                    | 1C              |       | WF                  | 71.75            | 11.65                              |
|                                                    |                 |       |                     |                  |                                    |
|                                                    | 2               | 45    | LP                  | 1387.33          | 458.49                             |
|                                                    | 2               |       | WF                  | 79.28            | 3.72                               |
| CONTRACT SPECIES SUMMARY                           |                 |       |                     |                  |                                    |
|                                                    |                 |       | DF                  | 395              |                                    |
|                                                    |                 |       | LP                  | 1387             |                                    |
|                                                    |                 |       | WF                  | 213              |                                    |
|                                                    |                 |       | NS                  | ---              | 530                                |
|                                                    |                 |       |                     |                  |                                    |
| GRAND TOTALS                                       | ALL             | 71    | ALL                 | 1995             | 530                                |

**VSM REPORTS -- Low Level Volume Summaries***Volume Summary***\*\*\*\* ALL TREES – CUT and LEAVE \*\*\*\***

Characteristics are presented by the following: Cruise, Leave, Product Source, Strata, Sample Group, Sure to Measure, Species, Product, Unit of Measure, Live, Yield Component, Contract Species and Tree Grade.

| <i>Report</i> | <i>Description</i>                                                                                                                                                                                                                                                                                                                              | <i>Available</i> | <i>Modified</i> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| VSM1          | Low Level Volume Summary: Primary, Secondary, and Recovered Product – Number of sample trees (first and second stage), quadratic mean dbh, mean dbh, average defect (% bdft and % cuft) and gross and net bdft to cuft ratio.<br>Strata Level: number of trees, gross and net volume (bdft, cuft, cords). (B1)                                  | ✓                |                 |
| VSM2          | Volume Summary for Sample Group: Primary, Secondary, and Recovered Product – Number of sample trees (first and second stage), quadratic mean dbh, mean dbh, mean height, average defect (% bdft, and % cuft), gross and net bdft to cuft ratio.<br>Strata Level: number of trees, gross and net board foot, cubic foot, and cords volume. (CP1) | ✓                |                 |
| VSM3          | Volume Summary for Strata: Primary, Secondary, and Recovered Product – Number of sample trees (first and second stage), quadratic mean dbh, mean dbh, mean height, average defect (% bdft and % cuft), gross and net bdft to cuft ratio.<br>Strata Level: Number of trees, gross and net board foot, cubic foot, and cords volume. (CS1)        | ✓                |                 |
| VSM4          | 3P Tree Report – Displays stratum, sample group, cutting unit, tree number, species, DBH, gross and net CUFT volume, expansion factor, KPI, calculated ratio and marker's initials. Currently, only methods S3P, 3P, and F3P are displayed in this report. (CP4)                                                                                | ✓                |                 |
| VSM5          | Volume Summary by Cutting Unit – Displays cutting unit, product, species, number of trees, gross and net cubic foot volume, secondary net cubic foot volume, QMD and BDFT/CUFT ratio.                                                                                                                                                           | ✓                |                 |
| VSM6          | Low Level Volume Summary – Displays the same grouping as the VSM1 report. Additionally, shows gross and net cuft to tons ratio, gross and net cuft volume and tons.                                                                                                                                                                             | NEW              |                 |
|               |                                                                                                                                                                                                                                                                                                                                                 |                  |                 |

## REPORT VSM1

|                                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                    |  |  |  |  |
|----------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------------------------------------|--|--|--|--|
| VSM1: LOW LEVEL VOLUME SUMMARY (B1)    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | PAGE 7                             |  |  |  |  |
| FOR CUT AND LEAVE TREES                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                    |  |  |  |  |
| CRUISE#: 20002 SALE#: 20002            |  |  |  |  |  |  |  |  |  |  |  |  |  |  | VERSION: DRAFT.2013                |  |  |  |  |
| SALENAME: R2 Test                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  | VOLUME LIBRARY VERSION: 09.23.2013 |  |  |  |  |
| RUN DATE & TIME: 12/12/2013 2:52:43 PM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                    |  |  |  |  |
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## REPORT VSM3

|                                        |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    |                                    |
|----------------------------------------|----|---|----|------------|------|------|------|------|-----|------|-----------|--------------------------|-------|--------------------|------------------------------------|
| VSM3: VOLUME SUMMARY FOR STRATA (CS1)  |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    | PAGE 11                            |
| FOR CUT TREES ONLY                     |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    |                                    |
| CRUISE#: 20002 SALE#: 20002            |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    | VERSION: DRAFT.2013                |
| SALENAME: R2 Test                      |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    | VOLUME LIBRARY VERSION: 09.23.2013 |
| RUN DATE & TIME: 12/12/2013 2:52:43 PM |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    |                                    |
|                                        |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    |                                    |
| P                                      | R  | O | D  | # OF TREES | M    | E    | A    | N    | AVG | DEFT | GROSS NET | ***** STRATA LEVEL ***** |       |                    |                                    |
| S                                      | R  | S | U  | A          | A    | A    | O    | T    | %   | %    | BDF       | BDF                      | EST.  | ***** VOLUME ***** |                                    |
| T                                      | O  | O | S  | L          | QUAD | N    | T    |      |     |      |           |                          |       |                    |                                    |
| R                                      | D  | U | O  | U          | L    |      |      |      | B   | C    |           |                          |       |                    |                                    |
| A                                      | U  | R | F  | R          | I    | MEAN | D    | H    | D   | U    | CUFT      | CUFT                     | # OF  |                    |                                    |
| T                                      | C  | C | E  | E          |      |      | S    | G    | F   | F    |           |                          |       |                    |                                    |
| A                                      | T  | E | M  | D          | D    | DBH  | H    | T    | T   | T    | RATIO     | RATIO                    | TREES | *** GROSS ***      | *** NET ***                        |
|                                        |    |   |    |            |      |      |      |      |     |      | BDF       | CUFT                     | BDF   | CUFT               | CORDS                              |
| 1                                      | 01 | P | 03 | 16         | 16   | 11.5 | 11.2 | 53.4 | 4   | 5    | 4.555     | 4.575                    | 16    | 1090               | 239                                |
| 10                                     | 01 | P | 03 | 17         | 30   | 12.3 | 12.1 | 56.8 | 4   | 4    | 4.774     | 4.784                    | 1860  | 167456             | 35075                              |
| 11                                     | 14 | P | 03 | 21         | 43   | 9.3  | 9.2  | 63.5 | 4   | 4    | 5.246     | 5.274                    | 387   | 26358              | 5025                               |
|                                        |    |   |    |            |      |      |      |      |     |      |           |                          |       | 25178              | 4774                               |
|                                        |    |   |    |            |      |      |      |      |     |      |           |                          |       |                    | 0.0                                |

## REPORT VSM4

|                                            |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
|--------------------------------------------|--------------|--------------|------|------|---------|------|--------------|------------|------------------|-----|------------|-------|-------------------|
| VSM4: 3P TREE REPORT (CP4)                 |              |              |      |      |         |      |              |            |                  |     |            |       | PAGE 13           |
| CUFT VOLUME                                |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| FOR CUT TREES ONLY -- PRIMARY PRODUCT ONLY |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| CRUISE#: 20002      SALE#: 20002           |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| SALENAME: R2 Test                          |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| VERSION: DRAFT.2013                        |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| RUN DATE & TIME: 12/12/2013 2:52:43 PM     |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| VOLUME LIBRARY VERSION: 09.23.2013         |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| STRATUM                                    | SAMPLE GROUP | CUTTING UNIT | PLOT | TREE | SPECIES | DBH  | GROSS VOLUME | NET VOLUME | EXPANSION FACTOR | KPI | TREE COUNT | RATIO | MARKER'S INITIALS |
| 2                                          | E            | 2            |      | 1    | ES      | 15.0 | 29.1         | 27.9       | 3.30             | 25  | 1          | 1.116 |                   |
|                                            |              | 2            |      | 5    | ES      | 12.0 | 20.6         | 19.8       | 3.59             | 23  | 1          | 0.861 |                   |
|                                            |              | 2            |      | 8    | ES      | 30.6 | 198.8        | 190.8      | 1.00             | 0   | 1          |       |                   |
|                                            |              | 2            |      | 11   | ES      | 13.3 | 23.8         | 22.8       | 1.84             | 45  | 1          | 0.507 |                   |
|                                            |              | 2            |      | 14   | ES      | 14.6 | 31.0         | 29.8       | 1.84             | 45  | 1          | 0.662 |                   |
|                                            |              | 2            |      | 15   | ES      | 14.2 | 27.7         | 26.6       | 1.20             | 69  | 1          | 0.386 |                   |
|                                            |              | 2            |      | 16   | ES      | 13.9 | 24.2         | 23.2       | 1.25             | 66  | 1          | 0.352 |                   |
|                                            |              | 2            |      | 17   | ES      | 12.2 | 15.0         | 14.4       | 1.50             | 55  | 1          | 0.262 |                   |
|                                            |              | 2            |      | 21   | ES      | 29.8 | 199.5        | 191.5      | 1.00             | 0   | 1          |       |                   |
|                                            |              | 2            |      |      | ES      |      |              |            |                  | 578 | 100        |       |                   |
| SUBTOTAL                                   |              | 2            |      |      |         |      | 569.7        | 546.8      | 16.51            | 578 | 109        |       |                   |
|                                            |              |              |      |      |         |      |              |            |                  |     |            |       |                   |
| 2                                          | L            | 2            |      | 2    | LP      | 16.2 | 47.0         | 44.7       | 2.37             | 30  | 1          | 1.490 |                   |



## REPORT VPA2

|                                               |    |   |    |     |      |      |      |      |     |
|-----------------------------------------------|----|---|----|-----|------|------|------|------|-----|
| VPAS: VOLUME PER ACRE SUMMARY BY STRATA (CS2) |    |   |    |     |      |      |      |      |     |
| FOR CUT TREES ONLY                            |    |   |    |     |      |      |      |      |     |
| CRUISE#: 20002 SALE#: 20002                   |    |   |    |     |      |      |      |      |     |
| SALENAME: R2 Test                             |    |   |    |     |      |      |      |      |     |
| RUN DATE & TIME: 12/12/2013 2:52:43 PM        |    |   |    |     |      |      |      |      |     |
| VERSION: DRAFT.2013                           |    |   |    |     |      |      |      |      |     |
| VOLUME LIBRARY VERSION: 09.23.2013            |    |   |    |     |      |      |      |      |     |
| P<br>R<br>O<br>D                              |    |   |    |     |      |      |      |      |     |
| P<br>R<br>O<br>D                              |    |   |    |     |      |      |      |      |     |
| S R S U *****PER ACRE *****                   |    |   |    |     |      |      |      |      |     |
| T O O EST.                                    |    |   |    |     |      |      |      |      |     |
| R D U O                                       |    |   |    |     |      |      |      |      |     |
| A U R F NO. OF                                |    |   |    |     |      |      |      |      |     |
| T C C *****GROSS***** *****NET*****           |    |   |    |     |      |      |      |      |     |
| A T E M TREES BDFT CUFT BDFT CUFT CORDS       |    |   |    |     |      |      |      |      |     |
| 1                                             | 01 | P | 03 | <1  | 61   | 13   | 58   | 13   | 0.0 |
| 10                                            | 01 | P | 03 | 103 | 9303 | 1949 | 8866 | 1853 | 0.0 |
| 11                                            | 14 | P | 03 | 22  | 1464 | 279  | 1399 | 265  | 0.0 |
| 2                                             | 01 | P | 03 | 25  | 546  | 96   | 522  | 92   | 0.0 |
| 3                                             | 14 | P | 03 | 22  | 1464 | 279  | 1399 | 265  | 0.0 |

## REPORT VPA3

|                                               |    |   |    |     |      |      |      |      |     |
|-----------------------------------------------|----|---|----|-----|------|------|------|------|-----|
| VPAS: VOLUME PER ACRE SUMMARY BY STRATA (CS2) |    |   |    |     |      |      |      |      |     |
| FOR CUT TREES ONLY                            |    |   |    |     |      |      |      |      |     |
| CRUISE#: 20002 SALE#: 20002                   |    |   |    |     |      |      |      |      |     |
| SALENAME: R2 Test                             |    |   |    |     |      |      |      |      |     |
| RUN DATE & TIME: 12/12/2013 2:52:43 PM        |    |   |    |     |      |      |      |      |     |
| VERSION: DRAFT.2013                           |    |   |    |     |      |      |      |      |     |
| VOLUME LIBRARY VERSION: 09.23.2013            |    |   |    |     |      |      |      |      |     |
| P<br>R<br>O<br>D                              |    |   |    |     |      |      |      |      |     |
| P<br>R<br>O<br>D                              |    |   |    |     |      |      |      |      |     |
| S R S U *****PER ACRE *****                   |    |   |    |     |      |      |      |      |     |
| T O O EST.                                    |    |   |    |     |      |      |      |      |     |
| R D U O                                       |    |   |    |     |      |      |      |      |     |
| A U R F NO. OF                                |    |   |    |     |      |      |      |      |     |
| T C C *****GROSS***** *****NET*****           |    |   |    |     |      |      |      |      |     |
| A T E M TREES BDFT CUFT BDFT CUFT CORDS       |    |   |    |     |      |      |      |      |     |
| 1                                             | 01 | P | 03 | <1  | 61   | 13   | 58   | 13   | 0.0 |
| 10                                            | 01 | P | 03 | 103 | 9303 | 1949 | 8866 | 1853 | 0.0 |
| 11                                            | 14 | P | 03 | 22  | 1464 | 279  | 1399 | 265  | 0.0 |
| 2                                             | 01 | P | 03 | 25  | 546  | 96   | 522  | 92   | 0.0 |
| 3                                             | 14 | P | 03 | 22  | 1464 | 279  | 1399 | 265  | 0.0 |

## VAL REPORTS -- Value and Weight Reports for Strata and Sale (For Cut Trees Only)

Characteristics are display by the following: Strata, Product, Product Source, and Unit of Measure.

| Report | Description                                                                                                                                                        | Available | Modified |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| VAL1   | Low Level \$ Value Summary: Primary, Secondary, and Recovered Product – Per Acre and Strata Level: \$ value, weight and total cubic foot volume. (B3)              | ✓         |          |
| VAL2   | Sample Group \$ Value Summary: Primary, Secondary, and Recovered Product – Per Acre Level and Strata Level: \$ value, weight and total cubic foot volume. (CP3)    | ✓         |          |
| VAL3   | Strata \$ Value & Weight Summary: Primary, Secondary, and Recovered Product – Per Acre Level and Strata Level: \$ value, weight and total cubic foot volume. (CS3) | ✓         |          |

## REPORT VAL1

|                                        |  |  |  |  |  |  |  |  |  |                                    |  |
|----------------------------------------|--|--|--|--|--|--|--|--|--|------------------------------------|--|
| VAL1: LOW LEVEL \$ VALUE SUMMARY (B3)  |  |  |  |  |  |  |  |  |  | PAGE 5                             |  |
| FOR CUT AND LEAVE TREES                |  |  |  |  |  |  |  |  |  |                                    |  |
| CRUISE#: 20002 SALE#: 20002            |  |  |  |  |  |  |  |  |  |                                    |  |
| SALENAME: R2 Test                      |  |  |  |  |  |  |  |  |  | VERSION: DRAFT.2013                |  |
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## REPORT VAL2

|                                                                                                                                                                                                                                       |    |   |    |   |   |  |  |  |  |                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|----|---|---|--|--|--|--|------------------------------------|
| VAL2: SAMPLE GROUP \$ VALUE SUMMARY (CPS)                                                                                                                                                                                             |    |   |    |   |   |  |  |  |  | PAGE 6                             |
| FOR CUT TREES ONLY                                                                                                                                                                                                                    |    |   |    |   |   |  |  |  |  |                                    |
| CRUISE#: 20002 SALE#: 20002                                                                                                                                                                                                           |    |   |    |   |   |  |  |  |  |                                    |
| SALENAME: R2 Test                                                                                                                                                                                                                     |    |   |    |   |   |  |  |  |  | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 3:14:06 PM                                                                                                                                                                                                |    |   |    |   |   |  |  |  |  | VOLUME LIBRARY VERSION: 09.23.2013 |
| <div> <div>P<br/>R<br/>O<br/>D</div> <div> <div>S<br/>T<br/>R<br/>A<br/>T</div> <div>R<br/>O<br/>D<br/>U<br/>C<br/>T</div> <div>S<br/>U<br/>O<br/>F<br/>C<br/>E</div> <div>M</div> </div> <div>S<br/>M<br/>P<br/>L<br/>E</div> </div> |    |   |    |   |   |  |  |  |  |                                    |
| ***** VALUE *****                                                                                                                                                                                                                     |    |   |    |   |   |  |  |  |  | ***** WEIGHT *****                 |
| ***** TOTAL CUFT *****                                                                                                                                                                                                                |    |   |    |   |   |  |  |  |  |                                    |
| STRATA STRATA STRATA                                                                                                                                                                                                                  |    |   |    |   |   |  |  |  |  | LEVEL PER ACRE                     |
| LEVEL PER ACRE                                                                                                                                                                                                                        |    |   |    |   |   |  |  |  |  |                                    |
| 1                                                                                                                                                                                                                                     | 01 | P | 03 |   |   |  |  |  |  |                                    |
|                                                                                                                                                                                                                                       |    |   |    |   |   |  |  |  |  |                                    |
| 10                                                                                                                                                                                                                                    | 01 | P | 03 |   |   |  |  |  |  |                                    |
|                                                                                                                                                                                                                                       |    |   |    |   |   |  |  |  |  |                                    |
| 11                                                                                                                                                                                                                                    | 14 | P | 03 |   |   |  |  |  |  |                                    |
|                                                                                                                                                                                                                                       |    |   |    |   |   |  |  |  |  |                                    |
| 2                                                                                                                                                                                                                                     | 01 | P | 03 | E | N |  |  |  |  |                                    |
| 2                                                                                                                                                                                                                                     | 01 | P | 03 | E | Y |  |  |  |  |                                    |
| 2                                                                                                                                                                                                                                     | 01 | P | 03 | L | N |  |  |  |  |                                    |
| 2                                                                                                                                                                                                                                     | 01 | P | 03 | P | N |  |  |  |  |                                    |
| 2                                                                                                                                                                                                                                     | 01 | P | 03 | P | Y |  |  |  |  |                                    |
| 3                                                                                                                                                                                                                                     | 14 | P | 03 |   |   |  |  |  |  |                                    |

## REPORT VAL3

|                                                                                                                                                                                                                                       |    |   |    |  |  |  |  |  |  |                                    |
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| VAL3: STRATA \$ VALUE SUMMARY (CS3)                                                                                                                                                                                                   |    |   |    |  |  |  |  |  |  | PAGE 8                             |
| FOR CUT TREES ONLY                                                                                                                                                                                                                    |    |   |    |  |  |  |  |  |  |                                    |
| CRUISE#: 20002 SALE#: 20002                                                                                                                                                                                                           |    |   |    |  |  |  |  |  |  |                                    |
| SALENAME: R2 Test                                                                                                                                                                                                                     |    |   |    |  |  |  |  |  |  | VERSION: DRAFT.2013                |
| RUN DATE & TIME: 12/12/2013 3:14:06 PM                                                                                                                                                                                                |    |   |    |  |  |  |  |  |  | VOLUME LIBRARY VERSION: 09.23.2013 |
| <div> <div>P<br/>R<br/>O<br/>D</div> <div> <div>S<br/>T<br/>R<br/>A<br/>T</div> <div>R<br/>O<br/>D<br/>U<br/>C<br/>T</div> <div>S<br/>U<br/>O<br/>F<br/>C<br/>E</div> <div>M</div> </div> <div>S<br/>M<br/>P<br/>L<br/>E</div> </div> |    |   |    |  |  |  |  |  |  |                                    |
| ***** VALUE *****                                                                                                                                                                                                                     |    |   |    |  |  |  |  |  |  | ***** WEIGHT *****                 |
| ***** TOTAL CUFT *****                                                                                                                                                                                                                |    |   |    |  |  |  |  |  |  |                                    |
| STRATA STRATA STRATA                                                                                                                                                                                                                  |    |   |    |  |  |  |  |  |  | LEVEL PER ACRE                     |
| LEVEL PER ACRE                                                                                                                                                                                                                        |    |   |    |  |  |  |  |  |  |                                    |
| 1                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
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| 10                                                                                                                                                                                                                                    | 01 | P | 03 |  |  |  |  |  |  |                                    |
|                                                                                                                                                                                                                                       |    |   |    |  |  |  |  |  |  |                                    |
| 11                                                                                                                                                                                                                                    | 14 | P | 03 |  |  |  |  |  |  |                                    |
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| 2                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| 3                                                                                                                                                                                                                                     | 14 | P | 03 |  |  |  |  |  |  |                                    |
| 4                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| 5                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| 6                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| 7                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| 8                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| 9                                                                                                                                                                                                                                     | 01 | P | 03 |  |  |  |  |  |  |                                    |
| TOTALS -----                                                                                                                                                                                                                          |    |   |    |  |  |  |  |  |  |                                    |

| <b>WT REPORTS – Weight Reports</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                 |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| <i>Report</i>                      | <i>Description</i>                                                                                                                                                                                                                                                                                                                                                                                                                                    | <i>Available</i> | <i>Modified</i> |
| WT1                                | Report displays weight by species across all strata with a summary by contract species. Data shown includes the cruise species, contract species, product (primary and secondary), gross CUFT volume, the weight factor, pounds standing, percent removed, pounds removed and tons removed. A footnote at the bottom shows how each column was calculated.                                                                                            | ✓                |                 |
| WT2                                | Slash Loading Summary by Strata: Report displays Dry Tons per Acre for crowns, topwood, cull logs and chunk logs. Weight is broken down by needles, 0-¼ ", ¼-1", 1-3", and 3" + for each category. Subtotals are shown for each category and an overall total is shown at the end of the report. Details are provided after the report example shown below. At least one page per stratum is generated with an overall sale summary on the last page. | ✓                |                 |
| WT3                                | Slash Loading Summary by Unit: Report is similar to the WT2 in that weight is broken down by the same categories. The data is organized by cutting unit. See the example below.                                                                                                                                                                                                                                                                       | ✓                |                 |
| WT4                                | Weight by Species and Product by Cutting Units – for cut trees only<br>Broken down by cutting units, this report shows the unit acres, species in the unit, green tons for sawtimber (primary product of 01), green tons for non-sawtimber (all other codes) and green tons for non-sawtimber secondary product only. An overall total is displayed at the end of the report.                                                                         | ✓                |                 |
| WT5                                | Biomass Sale Summary – for cut trees only<br>Summarizes biomass weight by stratum with an overall sale summary on the last page. Green tons are displayed by species. If main stem weight factors were entered, primary and secondary product weight is displayed. Biomass components are shown for tip, branches (live and dead), and foliage. A stem total as well as an overall total is shown.                                                    | ✓                |                 |
|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                 |

# REPORT WT1

WT1: WEIGHT BY SPECIES ACROSS STRATA  
FOR CUT TREES ONLY  
CRUISE#: 16002 SALE#: 16002  
SALENAME: Lava  
RUN DATE & TIME: 2/24/2017 1:42:33 PM

PAGE 107

VERSION: DRAFT.2017  
VOLUME LIBRARY VERSION: 11.21.2016

| CRUISE SPECIES | CONTRACT SPECIES | PRODUCT            | GROSS CUFT | (1)<br>WEIGHT FACTOR | (2)<br>POUNDS STANDING | (3)<br>PERCENT REMOVED | (4)<br>POUNDS REMOVED | (5)<br>TONS REMOVED |
|----------------|------------------|--------------------|------------|----------------------|------------------------|------------------------|-----------------------|---------------------|
| IC             |                  | 01 P               | 10690      | 58.00                | 620020                 | 95.00                  | 589019                | 294.51              |
| IC             |                  | 20 S               | 2270       | 86.00                | 195220                 | 95.00                  | 185459                | 92.73               |
| IC             |                  | 20 P               | 20151      | 86.00                | 1732986                | 95.00                  | 1646337               | 823.17              |
| PP             |                  | 01 P               | 457846     | 68.00                | 31133528               | 95.00                  | 29576852              | 14788.43            |
| PP             |                  | 20 S               | 51942      | 80.00                | 4155360                | 95.00                  | 3947592               | 1973.80             |
| PP             |                  | 20 P               | 206690     | 80.00                | 16535200               | 95.00                  | 15708440              | 7854.22             |
| SP             |                  | 01 P               | 268        | 69.00                | 18492                  | 95.00                  | 17567                 | 8.78                |
| SP             |                  | 20 S               | 38         | 80.00                | 3040                   | 95.00                  | 2888                  | 1.44                |
| WF             |                  | 01 P               | 586644     | 69.00                | 40478436               | 95.00                  | 38454514              | 19227.26            |
| WF             |                  | 20 S               | 51795      | 86.00                | 4454370                | 95.00                  | 4231652               | 2115.83             |
| WF             |                  | 20 P               | 245601     | 86.00                | 21121686               | 95.00                  | 20065602              | 10032.80            |
|                |                  |                    |            |                      |                        |                        |                       |                     |
|                |                  | SUMMARY            |            |                      |                        |                        |                       |                     |
|                |                  | CONTRACT SPECIES   | PRODUCT    | TONS REMOVED         |                        |                        |                       |                     |
|                |                  |                    | 01 P       | 34318.98             |                        |                        |                       |                     |
|                |                  |                    | 20 P       | 18710.19             |                        |                        |                       |                     |
|                |                  |                    | 20 S       | 4183.80              |                        |                        |                       |                     |
|                |                  | TOTAL TONS REMOVED | 57212.96   |                      |                        |                        |                       |                     |

(1) WEIGHT FACTOR = POUNDS PER GROSS CUFT  
(2) POUNDS STANDING = GROSS CUFT x WEIGHT FACTOR  
(3) PERCENT REMOVED = % MATERIAL HAULED OUT ON TRUCKS  
(4) POUNDS REMOVED = POUNDS STANDING x (PERCENT REMOVED/100)  
(5) TONS REMOVED = POUNDS REMOVED / 2,000

## REPORT WT2

WT2: SLASH LOADING SUMMARY BY STRATA

FOR CUT TREES ONLY

CRUISE#: 01 SALE#: 27102

SALENAME: James Creek Task Order

RUN DATE & TIME: 10-19-2007 07:55:11

PAGE 70

VERSION: DRAFT.2007

VOLUME LIBRARY VERSION: 10.18.2007

STRATUM: 7

SLASH LOAD SPECIES

| CROWNS              | DF   | ES   | LP   | PP   | TOTAL            |
|---------------------|------|------|------|------|------------------|
| NEEDLES             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| 0 - 1/4"            | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| 1/4 - 1"            | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| 1 - 3"              | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| 3"+                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| 3"+                 |      |      |      |      |                  |
| TOPWOOD             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| CULL VOLUME         | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| CHUNKS              | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| FLIW                | 0.65 | 0.50 | 0.45 | 0.75 |                  |
| DAMAGED SMALL TREES |      |      |      |      |                  |
| NEEDLES             | 0.16 | 0.15 | 0.15 | 0.23 | 0.69             |
| 0 - 1/4"            | 0.08 | 0.07 | 0.09 | 0.03 | 0.27             |
| 1/4 - 1"            | 0.11 | 0.06 | 0.11 | 0.18 | 0.46             |
| 1 - 3"              | 0.25 | 0.16 | 0.43 | 0.42 | 1.25             |
| 3"+                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00             |
| % Included          | 0.90 | 0.75 | 0.95 | 1.00 |                  |
| TOTAL               |      |      |      |      | STRATUM TOTAL/AC |
| OVEN DRY TONS/AC    | 0.60 | 0.44 | 0.78 | 0.85 | ALL SPECIES      |
|                     |      |      |      |      | 2.67             |

FLIW = Fraction Left in Woods

FLIW = Fraction Left in Woods

### Details for WT2 Report

**NOTE: All component data for this report now comes from the National Biomass Estimator Library (10/2015).**

The WT2 report displays estimated slash loading for cut trees only in the cruise. At least one page per stratum is created and includes values for species within the stratum for each category. Outputs are reported as oven dry tons per acre. The components of the report include: crowns, topwood, cull logs, chunks and damaged small trees. Each component is further described as follows:

- Crowns – includes branches, needles and the portion of the stem from 3” to tip. Dry weight is further broken down into – needles, 0 – ¼ inch material, ¼ - 1 inch material, 1- 3 inch material and 3 inch material. A separate column is included for the total.
- Topwood weight – Based on secondary product volume from top DIB of primary product to 3 inch DOB. It uses average oven dry weight factor.
- Cull Logs – Based on volume in logs coded grade 9. It also uses average oven dry weight factor.
- Chunks – Estimates the weight of cull wood bucked out and left in the woods. The user supplies the estimate of the fraction left in the woods. Based on primary product gross minus net volume, excluding cull logs with a grade 9.

During hand felling operations, chunks of the log which are culled for producing boards may be bucked out and left in the woods (for example, the crotch of forks, crooks, etc. These will be the cull chunks smaller than the amount that would cull an entire log.) The cruise report

shows gross and net volume for sawtimber. The difference is the total cull for sawtimber. The total sawtimber cull volume will be made up of cull logs, cull chunks bucked off and left in the woods, and some cull material left on the sawlogs that are shipped to the mill. The volume of the cull chunks left in the woods divided by the (total cull volume - cull logs with a grade 9) is the "fraction left in the woods." The user estimates the fraction based on local experience and timber sale requirements for slash removal.

- Damaged small trees – reported by the same categories as Crown described above.

## REPORT WT3

|                                            |      |      |      |      |      |      |                                    |
|--------------------------------------------|------|------|------|------|------|------|------------------------------------|
| WT3: SLASH LOADING SUMMARY BY CUTTING UNIT |      |      |      |      |      |      | PAGE 81                            |
| FOR CUT TREES ONLY                         |      |      |      |      |      |      |                                    |
| CRUISE#: 777 SALE#: 777                    |      |      |      |      |      |      |                                    |
| SALENAME: R5 Test File                     |      |      |      |      |      |      | VERSION: DRAFT.2007                |
| RUN DATE & TIME: 06-05-2007 07:53:31       |      |      |      |      |      |      | VOLUME LIBRARY VERSION: 02.16.2007 |
| CUTTING UNIT: 1                            |      |      |      |      |      |      |                                    |
| SLASH LOAD SPECIES                         |      |      |      |      |      |      |                                    |
| CROWNS                                     | DF   | IC   | JP   | LP   | PP   | RF   | TOTAL                              |
| NEEDLES                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01                               |
| 0 - 1/4"                                   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00                               |
| 1/4 - 1"                                   | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01                               |
| 1 - 3"                                     | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01                               |
| 3"+                                        | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00                               |
| 3"+                                        |      |      |      |      |      |      |                                    |
| TOPWOOD                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00                               |
| CULL VOLUME                                | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00                               |
| CHUNKS                                     | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00                               |
| FLIW                                       | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |                                    |
| TOTAL                                      |      |      |      |      |      |      | UNIT TOTAL/AC                      |
| OVEN DRY TONS/AC                           | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | ALL SPECIES                        |
|                                            |      |      |      |      |      |      | 0.08                               |

## REPORT WT4

|                                      |       |         |                                           |                                                |                                                 |                                    |
|--------------------------------------|-------|---------|-------------------------------------------|------------------------------------------------|-------------------------------------------------|------------------------------------|
| WT4: WEIGHT BY SPECIES AND PRODUCT   |       |         |                                           |                                                |                                                 | PAGE 90                            |
| BY CUTTING UNIT FOR THE SALE         |       |         |                                           |                                                |                                                 |                                    |
| FOR CUT TREES ONLY                   |       |         |                                           |                                                |                                                 |                                    |
| CRUISE#: 777 SALE#: 777              |       |         |                                           |                                                |                                                 |                                    |
| SALENAME: R5 Test File               |       |         |                                           |                                                |                                                 | VERSION: DRAFT.2007                |
| RUN DATE & TIME: 06-05-2007 07:53:31 |       |         |                                           |                                                |                                                 | VOLUME LIBRARY VERSION: 02.16.2007 |
| CUTTING UNIT                         | ACRES | SPECIES | SAWTIMBER<br>PRIM PROD = 01<br>GREEN TONS | NON-SAWTIMBER<br>OTHER PRIM PROD<br>GREEN TONS | NON-SAWTIMBER<br>SECOND PROD ONLY<br>GREEN TONS |                                    |
| 1                                    | 10    | DF      | 36                                        | 0                                              | 2                                               |                                    |
|                                      |       | IC      | 29                                        | 0                                              | 3                                               |                                    |
|                                      |       | JP      | 29                                        | 0                                              | 1                                               |                                    |
|                                      |       | LP      | 10                                        | 0                                              | 1                                               |                                    |
|                                      |       | RF      | 61                                        | 0                                              | 3                                               |                                    |
|                                      |       | SP      | 54                                        | 0                                              | 2                                               |                                    |
| SUBTOTAL                             |       |         | 219                                       | 0                                              | 12                                              |                                    |
| 2                                    | 10    | DF      | 7                                         | 0                                              | 0                                               |                                    |
|                                      |       | PP      | 56                                        | 0                                              | 5                                               |                                    |
|                                      |       | SP      | 9                                         | 0                                              | 0                                               |                                    |
|                                      |       | WF      | 68                                        | 0                                              | 10                                              |                                    |
| SUBTOTAL                             |       |         | 140                                       | 0                                              | 15                                              |                                    |
| 3                                    | 10    | PP      | 66                                        | 0                                              | 4                                               |                                    |
|                                      |       | WF      | 81                                        | 0                                              | 7                                               |                                    |
| SUBTOTAL                             |       |         | 146                                       | 0                                              | 11                                              |                                    |

## REPORT WT5

| WT5: BIOMASS SALE SUMMARY<br>FOR CUT TREES ONLY<br>CRUISE#: 100 SALE#: 100<br>SALENAME: Stumpy/Big Meadow CATX<br>RUN DATE & TIME: 5/5/2016 1:19:58 PM |                    |                      |     |          |         |        | PAGE 23                                                   |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|-----|----------|---------|--------|-----------------------------------------------------------|--|
|                                                                                                                                                        |                    |                      |     |          |         |        | VERSION: DRAFT.2016<br>VOLUME LIBRARY VERSION: 04.19.2016 |  |
| STRATUM: 1 GREEN TONS                                                                                                                                  |                    |                      |     |          |         |        |                                                           |  |
| SPECIES                                                                                                                                                | PRIMARY<br>PRODUCT | SECONDARY<br>PRODUCT | TIP | BRANCHES | FOLIAGE | MERCH* | TOTAL**                                                   |  |
| DF                                                                                                                                                     | 613.7              | 59.5                 | 0.0 | 105.8    | 46.7    | 841.5  | 825.7                                                     |  |
| ALL SPECIES                                                                                                                                            | 613.7              | 59.5                 | 0.0 | 105.8    | 46.7    | 841.5  | 825.7                                                     |  |
| * WHOLE TREE (ABOVE GROUND) BIOMASS AS CALCULATED USING THE TOT TREE EQN SPECIFIED IN DEFAULTS (REGIONAL).                                             |                    |                      |     |          |         |        |                                                           |  |
| ** TOTAL IS THE ADDITION OF PRIMARY PRODUCT, SECONDARY PRODUCT, TIP, BRANCHES AND FOLIAGE.                                                             |                    |                      |     |          |         |        |                                                           |  |
| WT5: BIOMASS SALE SUMMARY<br>FOR CUT TREES ONLY<br>CRUISE#: 100 SALE#: 100<br>SALENAME: Stumpy/Big Meadow CATX<br>RUN DATE & TIME: 5/5/2016 1:19:58 PM |                    |                      |     |          |         |        | PAGE 24                                                   |  |
|                                                                                                                                                        |                    |                      |     |          |         |        | VERSION: DRAFT.2016<br>VOLUME LIBRARY VERSION: 04.19.2016 |  |
| STRATUM: OVERALL SALE SUMMARY GREEN TONS                                                                                                               |                    |                      |     |          |         |        |                                                           |  |
| SPECIES                                                                                                                                                | PRIMARY<br>PRODUCT | SECONDARY<br>PRODUCT | TIP | BRANCHES | FOLIAGE | MERCH* | TOTAL**                                                   |  |
| DF                                                                                                                                                     | 613.7              | 59.5                 | 0.0 | 105.8    | 46.7    | 841.5  | 825.7                                                     |  |
| ALL SPECIES                                                                                                                                            | 613.7              | 59.5                 | 0.0 | 105.8    | 46.7    | 841.5  | 825.7                                                     |  |
| * WHOLE TREE (ABOVE GROUND) BIOMASS AS CALCULATED USING THE TOT TREE EQN SPECIFIED IN DEFAULTS (REGIONAL).                                             |                    |                      |     |          |         |        |                                                           |  |
| ** TOTAL IS THE ADDITION OF PRIMARY PRODUCT, SECONDARY PRODUCT, TIP, BRANCHES AND FOLIAGE.                                                             |                    |                      |     |          |         |        |                                                           |  |

### How is this report put together?

Here is a description of how each column is derived for this report.

*Primary Product* – calculated in the biomass library (NBEL).

*Secondary Product* – calculated in the biomass library (NBEL).

*Biomass Components* –

*Tip* – calculated from total stem (from NBEL) minus (primary plus secondary product plus live/dead branches plus foliage)

*Branches* – live branches and dead branches added together. Live and dead branches value returned from NBEL

*Foliage* – foliage value returned from NBEL

*Stem Wgt Merch* – the whole tree (above ground) biomass as calculated using the Tot Tree Eqn specified in the Weight Equation Table.

*Stem Wgt Total* – the total of primary product, secondary product, tip, branches, and foliage

### *Volume Warning Report*

If warnings are detected in the calculation of volumes as well as other calculations, this report appears at the end of the output. In general, it indicates the calculation of volume was not completed for a particular tree in the data. The report shows the strata, cutting unit, plot, and tree number along with a warning message. Possible warning messages are:

NO VOLUME EQUATION MATCH  
NO FORM CLASS  
DBH LESS THAN ONE  
TREE HEIGHT LESS THAN 4.5  
D2H IS OUT OF BOUNDS  
NO SPECIES MATCH  
ILLEGAL PP LOG HEIGHT  
ILLEGAL SP LOG HEIGHT  
NO UPPER STEM MEASUREMENTS  
ILLEGAL UPPER STEM HEIGHT  
UNABLE TO FIT PROFILE GIVEN DBH, MERCH HT & TOP DIA  
TREE HAS GREATER THAN 20 LOGS  
TOP DIAMETER GREATER THAN DBH INSIDE BARK  
BARK EQUATION DOES NOT EXIST OR YIELDS NEGATIVE DBHIB  
INVALID BIOMASS EQUATION  
PRIMARY PRODUCT HEIGHT REQUIRED FOR BIOMASS CALCULATION  
SECONDARY PRODUCT HEIGHT REQUIRED FOR BIOMASS CALCULATION  
RECOVERABLE DEFECT GREATER THAN SUM OF DEFECTS -- SUM OF  
DEFECTS USED IN CALCULATION  
SECONDARY PRODUCT WAS BLANK IN SAMPLE GROUPS – DEFAULT  
VALUE USED  
MORE THAN TWO UOMS DETECTED – THIS FILE WILL NOT LOAD IN TIM  
BIOMASS FLAG NOT CHECKED – NO WEIGHT CALCULATED

## GLOSSARY OF DEFINITIONS

This list of definitions is by no means exhaustive. Additional definitions can be found in Timber Cruising Handbook – Chapter 30. Formulas for calculating statistics under the different cruise methods can also be found in the Handbook.

**Alphanumeric** – entries may contain letters and/or numbers.

**Area-Based Cruise** – volumes are determined based on volume per acre and expanded by the numbers of acres in the stratum.

**Basal Area** – the cross sectional area of a tree at DBH expressed in square feet.

**BAF** – basal area factor

**Characteristic Factor** – used for plot cruises having count and measure trees. It is the total number of trees, counted and measured, divided by the number of measured trees.

**Coefficient of variation** – a measure of the relative variability and is used to compare the degree of variation between different populations.

**Combined Sampling Error** – a weighted combination of two or more sampling errors to get one sampling error.

**Confidence Interval** – the range of values around which the population mean is expected to fall.

**Default** – value used in a field when no other value is entered.

**Expansion Factor** – In any sampling scheme, only selected trees are completely measured. The trees that are measured also represent those that were not measured and must be expanded to get a total stand value.

**KPI** – an estimate of the predicted volume or value of a tree.

**Mean** – the average value obtained from dividing the sum of sample values by the number of samples.

**Numeric** – entries contain numbers only.

**Sample** – a subset of units selected from the population to represent the population.

**Sampling Error** – expresses the precision of the inventory. It is the percent error of an estimated mean at a desired probability level.

**Standard Deviation** – a measure of the dispersion of individual samples about the mean.

**Standard Error** – the standard error of the mean provides an estimate of the sampling error. It describes the variation of multiple sample means about the population. It can be estimated from a single sample as the square root of the sample variance divided by the sample size.

**Sum of X squared** – the value of all samples, squared, and added together.

**Sum of X** – the sum of all sample values

**t Value** – a normal frequency curve is divided into six units of standard deviation, plus and minus 1, 2, and 3. The t value can change based on sample size and may not always be reported as a whole number.

67 percent ( $t = 1$ ) is  $\pm 1$  standard deviation

95 percent ( $t = 2$ ) is  $\pm 2$  standard deviations

99 percent ( $t = 3$ ) is  $\pm 3$  standard deviations

**Tree-Based Cruise** – a cruise method where volumes are calculated or expanded based on individual tree volumes.

**Tree Factor** – a factor that expands each measured tree by the number of trees it represents.

**Variance** – a measure of how the sample unit values such as tree volumes are disbursed around the mean of the unit values.

## **Appendix F**

### **SYMBOL DEFINITIONS BY SAMPLE SYSTEM**

The values of 'N', 'n', 'X' and 'EXP FAC' for allowable sampling methods.

Population – a strata or a sample group within a strata.

EXP FAC – the expansion factor or weight given to an individual tree based on the sampling method used.

#### **TREE BASED SYSTEMS**

##### **100% Sample (Code = 100)**

N = the number of trees in the population.

n = the number of measured trees in the population. In this case  $N = n$ .

X = the volume (or value) of a tree.

EXP FAC = the expansion factor or weight will always be equal to 1.

##### **SAMPLE TREE (Code = STR)**

N = the number of trees in the population. This is the number of trees counted in the population.

n = the number of measured trees in the population.

X = the volume (or value) of a tree.

EXP FAC =  $N / n$

##### **PROBABILITY PROPORTIONAL TO PREDICTION (3P) (Code = C3P)**

N = the number of trees in the population. This is the number of trees for which a prediction (KPI) is made.

n = the number of measured trees in the population.

X = the ratio of an actual measured attribute to the predicted variable (KPI) for a measured tree.

EXP FAC = (the sum of KPIs) / ((n) \* KPI of the measured tree)

##### **SAMPLE TREE WITH 3P SUBSAMPLE (Code = S3P)**

###### **First Stage**

N = the number of trees in the population. This is the number of trees counted in the population.

**n** = the number of trees for which a predication was made.

**X** = the predicated attribute (KPI), usually volume or value of a tree.

### **Second Stage**

**N** = the number of trees for which a prediction (KPI) is made. This is the same as 'n' in the first stage.

**n** = the number of measured trees.

**X** = the ratio of an actual measured attribute to the predicated variable (KPI) for a measured tree.

**TREE FAC** = the number of trees counted / the number of trees for which a prediction was made.

**CHAR FAC** = (the sum of KPIs) / ((n) \* KPI of the measured tree)

**EXP FAC** = (TREE FAC) \* (CHAR FAC)

## **AREA BASED SYSTEMS**

### **POINT or VARIABLE PLOT (Code = PNT)**

**N** = the number of points possible. For practical purposes this is infinite.

**n** = the number of points taken.

**X** = the per acre volume (or value) for a point.

**TREE FAC** = (BAF) / ((.005454) \* (DBH \* DBH))

**EXP FAC** = (TREE FAC) / the number of points taken

### **POINT WITH 3P SUBSAMPLE (Code = P3P)**

#### **First Stage**

**N** = the number of points possible. For practical purposes this is infinite.

**n** = the number of points established.

**X** = the total of the KPIs (estimated heights) for a point. When calculating the number of sample points needed use expanded volume per point as the X term.

#### **Second Stage**

**N** = the number of trees for which a prediction (KPI) is made.

**n** = the number of trees measured in the population.

**X** = a ratio of the measured volume to (KPI \* DBH \* DBH) for a measured tree.

**TREE FAC** = (BAF) / ((.005454) \* (DBH \* DBH))

**CHAR FAC** = (the sum of KPIs by species) / ((number of measured trees by species) \* KPI of the measured tree)

**EXP FAC** = (((TREE FAC) \* (CHAR FAC)) / number of points established)  
The number of points is 'n' from the first stage of sample.

#### **POINT WITH COUNT MEASURE PLOTS (Code = PCMPLT)**

##### **First Stage**

**N** = the number of points possible. For practical purposes this is infinite.

**n** = the number of points established.

**X** = the number of measured trees on a point.

##### **Second Stage**

**N** = number of counted and measured points.

**n** = number of measured points.

**X** = the per acre volume or value represented by a measured point

The error term is calculated using the method recommended by Floyd A. Johnson in his Research Note number 201,  
Pacific Northwest Forest and Range Experiment Station, January 1961.

**TREE FAC** = (BAF) / ((.005454) \* (DBH \* DBH))

**CHAR FAC** = the total number of trees counted and measured by species divided by the number of measured trees by species.

**EXP FAC** = ((TREE FAC) \* (CHAR FAC)) / number of points established

#### **POINT WITH COUNT MEASURE TREES (Code = PCMTRE)**

##### **First Stage**

**N** = the number of points possible. For practical purposes this is infinite.

**n** = the number of points established.

**X** = the number of measured trees at a point

##### **Second Stage**

**N** = the number of counted and measured trees.

**n** = the number of trees measured.

**X** = the sum of the volume or value to basal area ratio for measured trees on a point.

**TREE FAC** = (BAF) / ((.005454) \* (DBH \* DBH))

**CHAR FAC** = the total number of trees counted and measured by species divided by the number of measured trees by species.

**EXP FAC** = ((TREE FAC) \* (CHAR FAC)) / number of points established

**FIXED AREA PLOT (Code = FIX)**

**N** = the number of plots possible. This is the total area sampled divided by the area of a sample plot.

**n** = the number of plots established.

**X** = the total volume (or value) represented by a plot.

**EXP FAC** = denominator of plot size / number of plots established

**FIXED AREA PLOT WITH 3P SUBSAMPLE (Code = F3P)**

**First Stage**

**N** = the number of plots possible. This is the total area sampled divided by the area of a sample plot.

**n** = the number of plots taken.

**X** = the total estimated volume or value (the sum of the KPIs) for a plot. This is an unexpanded KPI.

**Second Stage**

**N** = the number of trees for which a prediction (KPI) is made.

**n** = the number of trees measured.

**X** = the ratio of an actual measured attribute to the predicated volume or value (KPI) for a measured tree.

**TREE FAC** = the denominator of plot size

**CHAR FAC** = (the sum of KPIs by species) / ((number of measured trees by species) \* KPI of the measured tree)

**EXP FAC** = (((TREE FAC) \* (CHAR FAC)) / number of plots established)

## Appendix G

### TABLE OF ERROR CODES



Error messages are reported differently in *CruiseProcessing*. In the example printout above, the table containing the error is listed first followed by select identifying fields and the error message. Some of the error messages are generic in nature and field names are added to make the message meaningful. In the error messages listed below, an ellipsis is used to indicate where the field name is placed. The second column in this table, Probable Cause, gives a possible reason for the error to be detected.

| ERROR CODE | ERROR MESSAGE                                                      | PROBABLE CAUSE                                                                                     |
|------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1          | Invalid volume, value or quality adjustment equation number        | An equation number in one of these tables is not valid.                                            |
| 2          | Value or quality adjustment coefficient missing on this record     | An equation requiring coefficients is missing one or more coefficients.                            |
| 3          | Must find primary product before secondary product                 | No primary product flags were checked.                                                             |
| 4          | Secondary top DIB greater than primary top DIB                     | On a volume equation record, these values may be switched                                          |
| 5          | Duplicate volumes requested on same species/product code           | Species/product code entered twice in volume equation table.                                       |
| 6          | Same equation number with different top diameters                  | Different top diameters on two volume equation records.                                            |
| 7          | Invalid ... number (for example, stratum, plot, unit)              | Inconsistency between tables for select values like stratum.                                       |
| 8          | ... cannot be blank or empty                                       | Indicates an empty required field.                                                                 |
| 9          | ... contains an invalid code                                       | Recorded value not found in validation list                                                        |
| 10         | Tree count cannot be greater than 1 for this record                | Recorded tree count is greater than 1                                                              |
| 11         | Count/measure code is in error on this record                      | Certain cruise methods do not allow count trees                                                    |
| 12         | No volume equation match                                           | No match in volume equations for species/product code                                              |
| 13         | More than 20 logs for this tree                                    | More than 20 logs were recorded for this tree                                                      |
| 14         | Strata/SMPGRP tree must have same UOM, product and cut/leave codes | Either UOM, product, and/or cut/leave codes are different or missing for this stratum/sample group |

| <b>ERROR CODE</b> | <b>ERROR MESSAGE</b>                                             | <b>PROBABLE CAUSE</b>                                           |
|-------------------|------------------------------------------------------------------|-----------------------------------------------------------------|
| 15                | Plot cannot have both count and measure trees                    | Count tree in a measured plot                                   |
| 16                | Method must have species, product, UOM, and/or leave codes blank | Count tree with species, product, UOM & leave codes filled in   |
| 17                | Method must have one sample group per strata                     | More than one sample group per stratum (3PPNT)                  |
|                   |                                                                  |                                                                 |
| 18                | Cannot have an upper stem diameter greater than DBH              | Recorded upper stem diameter is greater than recorded DBH       |
| 19                | Variable Log Length cruise is missing mandatory fields           | Mandatory fields are missing                                    |
| 20                | Gross data must be greater or equal to net data                  | Fall, buck and scale – recorded gross is less than recorded net |
| 21                | Species, product or UOM codes must be entered on this record     | Tree count is greater than zero or DBH is greater than zero     |
| 22                | Basal area factor required for Point cruises                     | BAF not recorded for stratum                                    |
| 23                | Fixed plot size required for Fixed Plot cruises                  | Fixed plot size not recorded for stratum                        |
| 24                | Acres required for area based cruises                            | Acres not recorded for stratum                                  |
| 25                | ... table cannot be empty                                        | Indicated table has no records                                  |
| 26                | No reports selected                                              | Reports list is empty                                           |
| 27                | KPI estimate cannot be zero for this tree                        | Measured tree with KPI of zero and 3P code is not 3             |
| 28                | More than one sale record is not allowed                         | Cruise has more than one sale record                            |
| 29                | Percent Recoverable cannot be greater than Percent Seen Defect   | Percent seen defect is less than percent recoverable            |
| 30                | Sample group has no measured trees                               | No measured trees recorded for sample group                     |
| 31                | Invalid tree default value key code on tree                      | Code missing or incorrect – Contact FMSC for help               |
| 32                | No height recorded for this tree                                 | One of four heights not recorded in tree data                   |
|                   |                                                                  |                                                                 |

## **Appendix H**

### **The Biomass Calculation from Volume Estimator Library**

1. Primary product, secondary product and stem tip

The biomass calculation for these components (green weight) is using cubic foot volume return from volume estimator library multiply by weight factor.

$$\text{GRNBIO\_StemP} = \text{CUFTP} * \text{WF1}$$

$$\text{GRNBIO\_StemS} = \text{CUFTS} * \text{WF2}$$

$$\text{GRNBIO\_StemTip} = \text{CUFTTip} * \text{WF2}$$

Where

GRNBIO\_StemP (lbs) = main stem primary product green weight, including bark,

CUFTP (cf) = main stem primary product wood cubic foot volume,

WF1 (lb/cf) = primary product weight factor for the species, if the species does not have a regional/forest default weight factor in the table above, the national default weight factor will be used (Miles and Smith 2009, Table 1B Column: Avg. green weight of wood and bark (lb.cf)),

GRNBIO\_StemS (lbs) = main stem secondary product green weight, including bark,

CUFTS (cf) = main stem secondary product wood cubic foot volume,

WF2 (lb/cf) = secondary product weight factor for the species. If the species does not have a regional/forest default weight factor for the secondary product in the table above, its primary product weight factor will be used. If there is no regional/forest default weight factor for the primary product, the national default weight factor will be used (Miles and Smith 2009, Table 1B Column: Avg. green weight of wood and bark (lb.cf)),

GRNBIO\_StemTip (lbs) = main stem tip green weight, including bark.

2. Above ground total, live branches, dead branches, and foliage

If there is a biomass equation in the regional/forest defaults for these biomass components, the biomass will be calculated using the formula of the equation. However, when there is no biomass equation for these biomass components, the biomass is calculated using Component Ratio Method (CRM) with Jenkins et al (2003) equation.

Jenkins' equation calculates Above Ground Total (AGT) biomass for 10 species groups. It also calculates component ratio to AGT for merchantable stem wood and bark, foliage, and roots.

Table 1. Parameters for estimating total aboveground biomass.

| Species class | Species group                 | parameters     |                |
|---------------|-------------------------------|----------------|----------------|
|               |                               | B <sub>0</sub> | B <sub>1</sub> |
| Hardwood      | Aspen/alder/cottonwood/willow | -2.2094        | 2.3867         |
|               | Soft maple/birch              | -1.9123        | 2.3651         |
|               | Mixed hardwood                | -2.4800        | 2.4835         |
|               | Hard maple/oak/hickory/beech  | -2.0127        | 2.4342         |
| Softwood      | Cedar/larch                   | -2.0336        | 2.2592         |
|               | Douglas-fir                   | -2.2304        | 2.4435         |
|               | True fir/hemlock              | -2.5384        | 2.4814         |
|               | Pine                          | -2.5356        | 2.4349         |
|               | Spruce                        | -2.0773        | 2.3323         |
| Woodland      | Juniper/oak/mesquite          | -0.7152        | 1.7029         |

$$\text{DRYBIO\_AGT\_JENKINS} = 2.2046 * \text{EXP}(B_0 + B_1 * \text{LN}(\text{DBH} * 2.54))$$

Where DRYBIO\_ABT\_JENKINS (lb) = dry biomass for total aboveground with Jenkins equation, DBH in inches B<sub>0</sub> and B<sub>1</sub> are parameters for Jenkins equation.

Table 2. Parameters for estimating component ratios of total aboveground biomass.

| Species class | Biomass component | parameters     |                |
|---------------|-------------------|----------------|----------------|
|               |                   | B <sub>0</sub> | B <sub>1</sub> |
| Hardwood      | Foliage           | -4.0813        | 5.8816         |
|               | Coarse roots      | -1.6911        | 0.8160         |
|               | Stem bark         | -2.0129        | -1.6805        |
|               | Stem wood         | -0.3065        | -5.4240        |
| Softwood      | Foliage           | -2.9584        | 4.4766         |
|               | Coarse roots      | -1.5619        | 0.6614         |
|               | Stem bark         | -2.0980        | -1.1432        |
|               | Stem wood         | -0.3737        | -1.8055        |

The component proportions of aboveground total biomass is estimated as:

$$\text{RATIO} = \text{EXP}(B_0 + B_1 / (\text{DBH} * 2.54))$$

Where

RATIO = ratio for each component (foliage, coarse roots, merchantable stem wood and bark), FOLIAGE\_RATIO for foliage, ROOT\_RATIO for coarse roots, BARK\_RATIO for stem bark and WOOD\_RATIO for stem wood.

Therefore,

$$\text{DRYBIO\_FOLIAGE\_JENKINS (lb)} = \text{DRYBIO\_ABT\_JENKINS} * \text{FOLIAGE\_RATIO}$$

$$\text{DRYBIO\_ROOTS\_JENKINS} = \text{DROBIO\_ABT\_JENKINS} * \text{ROOT\_RATIO}$$

$$\text{DRYBIO\_BARK\_JENKINS} = \text{DROBIO\_ABT\_JENKINS} * \text{BARK\_RATIO}$$

$$\text{DRYBIO\_WOOD\_JENKINS} = \text{DROBIO\_ABT\_JENKINS} * \text{WOOD\_RATIO}$$

The merchantable stem wood biomass can also be estimated from stem wood volume (from stump to 4 in top) and wood density as:

$$\text{DRYBIO\_STEM\_WOOD} = \text{MERCH\_VOL} * \text{WOOD\_DENSITY}$$

Where MERCH\_VOL = stem wood cubic foot volume from stump to 4 in top, WOOD\_DENSITY = species wood density from Miles and Smith (2009). Since the estimation of wood biomass using volume and wood density is more accurate than the estimation from Jenkins' ratio method for a given tree, an adjustment factor is calculated to adjust JENKINS biomass.

$$\text{ADJ\_FACTOR} = \text{DRYBIO\_STEM\_WOOD} / \text{DRYBIO\_WOOD\_JENKINS}$$

The adjustment factor (ADJ\_FACTOR) is applied to the biomass calculated from Jenkins as:

$$\text{DRYBIO\_STEM\_BARK} = \text{DRYBIO\_BARK\_JENKINS} * \text{ADJ\_FACTOR}$$

$$\text{DRYBIO\_AGT} = \text{DRYBIO\_AGT\_JENKINS} * \text{ADJ\_FACTOR}$$

$$\text{DRYBIO\_FOLIAGE} = \text{DRYBIO\_FOLIAGE\_JENKINS} * \text{ADJ\_FACTOR}$$

The green biomass is calculated from dry biomass with moisture content (MC). When MC is not listed in the regional default for the species, it will be calculated from the green weight factor and dry weight factor from Miles and Smith (2009) as:

$$\text{MC} = (\text{GRNWF} - \text{DRYWF}) / \text{DRYWF} * 100$$

Where GRNWF = green weight factor, WF1, if there is no WF1 for the species in the regional/forest default, use Avg. green weight of wood and bark (lb.cf) from Miles and Smith (2009);

DRYWF = dry weight factor, i.e. the Avg. oven-dry weight of wood and bark (lb.cf) from Miles and Smith (2009).

$$\text{GRNBIO\_AGT} = \text{DRYBIO\_AGT} * (1 + \text{MC}/100)$$

$$\text{GRNBIO\_FOLIAGE} = \text{DRYBIO\_FOLIAGE} * (1 + \text{MC}/100)$$

The branches biomass is calculated by subtracting foliage, merch stem (wood and bark), and stump from the aboveground total biomass.

$$\text{GRNBIO\_BRANCHES} = \text{GRNBIO\_AGT} - \text{GRNBIO\_FOLIAGE} - \text{GRNBIO\_StemP} - \text{GRNBIO\_StemS} - \text{GRNBIO\_STUMP}$$

Where GRNBIO\_STUMP = green biomass for stump, stump wood volume multiply by green weight factor.

### 3. Example of biomass calculation for Cruise Processing

Here is an example to show biomass estimation for a 19-inch tree, Douglas-fir in Region 6 Malheur Forest (Forest number 4).

Regional/Forest default for Douglas-fir: primary weight factor WF1 = 60.7. There is no secondary weight factor, so the calculation will use WF2 = WF1. Also there is no biomass equation in the default for above ground total, live branches, dead branches, foliage and stem tip. Jenkins (2003) and CRM is used for the calculation of component biomass.

The dry weight factor (DWF) from Mile and Smith (2009) is 29.3. So the moisture content (MC) is calculated as:  $MC = (WF1 - DWF) / DWF * 100 = (60.7 - 29.3) / 29.3 * 100 = 85.1$

#### 3.1 Stem biomass calculation with cubic volume and weight factor

From volume library (VOLEQ = I12FW2W202, DBH = 19, HTTOT = 86), we get the main stem primary wood volume CUFTP = 57.2, secondary wood volume CUFTS = 1.2, stump volume CUFTStump = 2.0 and tip volume CUFTTip = 0.2. So the biomass for the main stem is:

The main stem primary product:  $\text{GRNBIO\_StemP} = \text{CUFTP} * \text{WF1} = 57.2 * 60.7 = 3472$

The main stem secondary product:  $\text{GRNBIO\_StemS} = \text{CUFTS} * \text{WF2} = 1.2 * 60.7 = 72.8$

The main stem tip:  $\text{GRNBIO\_StemTip} = \text{CUFTTip} * \text{WF2} = 0.17 * 60.7 = 10.3$

The stump:  $\text{GRNBIO\_STUMP} = \text{CUFTStump} * \text{WF1} = 2.0 * 60.7 = 121.4$

#### 3.2 Biomass calculation with Jenkins' equation

The Jenkins' paired coefficients (B0, B1) needed for Douglas-fir are: (-2.2304, 2.4435) for total aboveground biomass, (-2.9584, 4.4766) for foliage component ratio, and (-0.3737, -1.8055) for stem wood component ratio. Therefore,

$$\begin{aligned} \text{DRYBIO\_AGT\_JENKINS} &= 2.2046 * \text{EXP}(B_0 + B_1 * \text{LN}(\text{DBH} * 2.54)) \\ &= 2.2046 * \text{EXP}(-2.2304 + 2.4435 * \text{LN}(19 * 2.54)) = 3079.8 \end{aligned}$$

$$\text{FOLIAGE\_RATIO} = \text{EXP}(B_0 + B_1 / (\text{DBH} * 2.54)) = \text{EXP}(-2.9584 + 4.4766 / (19 * 2.54)) = 0.0569$$

$$\text{WOOD\_RATIO} = \text{EXP}(B_0 + B_1 / (\text{DBH} * 2.54)) = \text{EXP}(-0.3737 - 1.8055 / (19 * 2.54)) = 0.6629$$

$$\text{DRYBIO\_FOLIAGE\_JENKINS} = \text{DRYBIO\_AGT\_JENKINS} * \text{FOLIAGE\_RATIO} = 3079.8 * 0.0569 = 175.4$$

$$\text{DRYBIO\_WOOD\_JENKINS} = \text{DRYBIO\_AGT\_JENKINS} * \text{WOOD\_RATIO} = 3079.8 * 0.6629 = 2041.7$$

3.3 The adjustment factor and moisture content to convert dry to green

It is believed that the stem wood biomass calculated from cubic foot volume is more accurate than the estimation from Jenkins' component ratio method, an adjustment factor is calculated.

$$\begin{aligned} \text{DRYBIO\_STEM\_WOOD} &= \text{MERCH\_VOL} * \text{WOOD\_DENSITY} = (\text{CUFTP} + \text{CUFTS}) * \text{WOODDEN} \\ &= (57.2 + 1.2) * 28.1 = 1641 \end{aligned}$$

$$\begin{aligned} \text{ADJ\_FACTOR} &= \text{DRYBIO\_STEM\_WOOD} / \text{DRYBIO\_WOOD\_JENKINS} = \\ &= 1641 / 2041.7 = 0.8038 \end{aligned}$$

The moisture content (MC) is calculated from green weight factor and dry weight factor to convert dry to green:

$$\text{MC} = (\text{GRNWF} - \text{DRYWF}) / \text{DRYWF} * 100 = (60.7 - 29.3) / 29.3 * 100 = 85.1$$

$$\begin{aligned} \text{GRNBIO\_AGT} &= \text{DRYBIO\_AGT\_JENKINS} * \text{ADJ\_FACTOR} * (1 + \text{MC}/100) \\ &= 2475.4 * 0.8038 * (1 + 85.1/100) = 4581 \end{aligned}$$

$$\begin{aligned} \text{GRNBIO\_FOLIAGE} &= \text{DRYBIO\_FOLIAGE\_JENKINS} * \text{ADJ\_FACTOR} * (1 + \text{MC}/100) \\ &= 141.8 * 0.8038 * (1 + 85.1/100) = 262.5 \end{aligned}$$

The branches biomass is calculated from subtracting foliage, stem wood and bark, stump from the aboveground total:

$$\begin{aligned} \text{GRNBIO\_BRANCHES} &= \text{GRNBIO\_AGT} - \text{GRNBIO\_FOLIAGE} - \text{GRNBIO\_StemP} - \\ &\text{GRNBIO\_StemS} - \text{GRNBIO\_STUMP} = 4581 - 262.5 - 3472 - 72.8 - 121.4 = 652.3 \end{aligned}$$

## ***Appendix J***

### **Basic Regression Analysis**

Description: The statistical term regression, as used in this document, is comparable to the word prediction. Regression analysis can be described as a statistical tool that utilizes the relation between two or more variables so that one variable can be predicted from the other, or others (Neter and Wassermann, 1974). For example, if we know the relationship, by means of regression analysis, between DBH and gross cubic foot volume, we can predict the gross cubic foot volume of a tree once DBH is known.

Before we can start talking about the mechanics of regression, we need to define some terms. The predictor variable is called the independent variable, and is usually denoted by the letter X. The target variable, or the variable we wish to predict, is called the dependent variable and is usually denoted by the letter Y. In the previous example, DBH would be the independent variable while gross cubic foot volume would be the dependent variable. We will define more terms throughout the discussion.

#### How regression works

Often, the first step is to plot the dependent variable over the independent variable. This is done to provide some visual evidence of whether the two variables are related. If there is a relationship between the two variables, the plotted points will show a pattern. If the relationship is very strong, the pattern will be very distinct. If the relationship is weak, the plotted points will be more spread out and the pattern will be less definite. In a nutshell, regression analysis plots a single line that best describes that pattern. The line could be straight or curved, but it is always defined by a single equation. A line (assuming a straight line for now) can be described by the equation:

$$Y = a + bX$$

where: a = the y-intercept or where the line crosses the y-axis.

b = slope of the line or how much Y changes with each change in X.

If we substitute our dependent and independent variables for the Y and X variables in the above equation, we will now have an equation for a regression line. To determine the regression line, we must fit or estimate the values for the y-intercept and the slope of the line. These estimated values are known as regression coefficients.

How do we estimate the y-intercept and the slope of the line? One way would be to simply draw a straight line through the center of the data points and then measure its intercept and slope. But there are two problems with this approach. First, different people would draw slightly different lines. Second, there is no guarantee that our line is the “best possible” line. To alleviate both these problems, we employ an objective approach to finding the best possible line.

Since we will be using our line for making predictions, we would like the predicted value of Y (or dependent variable) to be as close as possible to the actual, or observed, value of Y for each

observation. Equivalently, we would like the difference between the predicted value of Y and the actual value of Y to be as small as possible for each observation. This difference between the predicted and the actual value of Y is called the residual and can be thought of as the vertical distance between the plotted data point and the regression line. Because we would like the residual to be small for each observation, we could try summing them to find the line that minimizes the sum of the residuals. Unfortunately, this is not an adequate criterion for choosing a “best fitting” line. Any line that passes through the exact center of the data (or passes through the point described by the mean of X and the mean of Y) has a sum of residuals equal to zero. For such a line, half the values are too small and half are too large and the resulting sum of the residuals equals zero.

To avoid the cancellation of positive and negative values, we square each residual before summing. Now, when we find a line that minimizes the sum of these squared residuals, we have found our “best fitting” line. This procedure is known as the method of least squares or least squares regression.

A regression line can be thought of as a moving average. It gives an average value of Y associated with a particular value of X. Some of the actual values of Y will be above the regression line, or moving average, and some will be below. Using the example defined earlier with gross cubic volume to DBH, our regression line, or moving average, would predict the average gross cubic foot volume for each given DBH.

The next question we will need to ask is how well did our regression line fit our data? Now that we have found what we have defined as our “best fitting” line using least squares regression, we want to know accurately does that line describe the relationship, or pattern, between our dependent and independent variables. One method is to examine the R-Squared or Coefficient of Variation. The R-Squared value is a measure, ranging from 0 to 1, of the percent of variability in the dependent variable that is explained by independent variable. Each dependent variable has some natural variability associated with it. A regression line is trying to account for as much of that natural variability as possible. The R-Squared value is the percent of the variability associated with the dependent variable that the independent variable can account for.

A high R-Squared value means the actual data points fall close to the regression line. If all the data points fall on the regression line, the R-Squared value would be 1.0. If there were no pattern in the data whatsoever, the R-Squared value would be 0. Do not confuse the R-Squared value with a level of confidence. There is no upper limit to shoot for when looking at an R-Squared value. Either a relationship between the dependent and independent variables exists or it does not. No amount of data will give you an R-Squared value of 0.95 if no relationship exists.

For example, let's take gross cubic volume as our dependent variable. There is some natural variation in gross cubic volume from tree to tree; small trees tend to have small gross cubic foot volumes, while big trees tend to have large gross cubic foot volumes. If we select DBH as our independent variable and run a regression on gross cubic volume, we will probably end up with an R-Squared value close to 1 because DBH is a good indicator of tree size and tree size is a good indicator of gross cubic volume. Let's say we end up with an R-Squared of 0.9552. We can say that 95.52% of the variability in gross cubic foot volume was associated with DBH.

The Mean Square Error (MSE) is another variable we can use to evaluate how well our model fit the data. The MSE is the residual sum of squares divided by the degrees of freedom. The degree of freedom is defined as the total number of samples minus the number of variables in the regression equation minus one. With our linear equation given above, our degrees of freedom would be the number of samples minus one for the independent variable, minus one, or the number of samples minus two. The MSE is the variance of the regression model and can be used the same way a sampling variance can be used, including building confidence intervals around your regression line.

### Selecting a Model

More often than not, the pattern displayed by plotting the dependent over the independent variable will show some sign of curvature. In this case, we would want to use an equation that can accommodate this curvature. The most common equations used to account for curvature in regression are the quadratic, natural logarithmic, and the exponential or power function. Choosing an appropriate regression equation model is just as important as choosing the right predictor variable. If the pattern displays an exponential trend, a linear equation will not fit the data as well as an exponential equation will. When comparing regression equations for the best model, compare the R-Squared value, the MSE, and plots of the residual values. The best model should have the highest R-Squared value, the lowest MSE, and display no discernible pattern in the residual plot.

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