

TallTimber 3.5 Operator's Manual

(with Timberpad Supplement)



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Guide to the TallTimber 3.5 Forest Inventory and Growth Processor

About this Manual

The front section of this document is intended to help people better understand and use TallTimber 3.5. The last 20 pages strive to do the same for Timberpad Pro 2.0. Our goal is to provide you with thoughtful instruction in a variety of formats, so that we communicate in a way that is effective for you, putting you on a pathway to success in your timber inventory and growth modeling. If you are struggling with a technical issue or just need some general feedback, consider the below options for getting back on track. We want your computer time to be productive, and suggest you keep this operator's manual nearby when questions arise. For a Quick Start guide to TallTimber 3.5, go to page 50.

Forms of Technical Support:

1. Operator's manual (this document)
 2. Program itself has some instructions under the  icons.
 3. Instructional videos on YouTube channel playlist (TTimber channel, Appendix C has link)
 4. Website: www.ttimmer.com
 5. Email us: support@ttimmer.com
 6. Call us: 207.377.3956 or schedule a visit or a workshop for you or your group
-



What is TallTimber 3.5?

TallTimber is a computer application that provides forest inventory and growth & yield modeling reports along with spreadsheet ready, copy/paste tables. Earlier versions have been used to process and report on millions of acres of timberland across the United States from Maine to California to Alabama. By forest inventory, we mean the characterization of the standing timber represented by a timber cruise dataset. The growth & yield modeling aspect of TallTimber means that the full version of TallTimber has a handy tool (TallTimber 2 FVS) that seamlessly converts the timber cruise dataset into Forest Vegetation Simulator (FVS) input files, opens FVS for growth modeling, and then brings FVS output back into TallTimber for additional reporting at the stand/strata or property level. In this way, the full functioning of TallTimber is to create a professional report profiling the current timber inventory while also including summarized outputs of future stocking and forest change (gross growth, mortality, net growth) as projected by FVS. The first two thirds of this manual will be targeted towards describing this process, with the last third describing the companion software, Timberpad Pro 2.0. Figure 1 shows a simplified characterization of TallTimber. The section titled *TallTimber 3.5, Microsoft Access (MS-Access) and Its Free Runtime Version* is located near the end of this manual. Go there if you are interested in learning about versioning and set up questions.

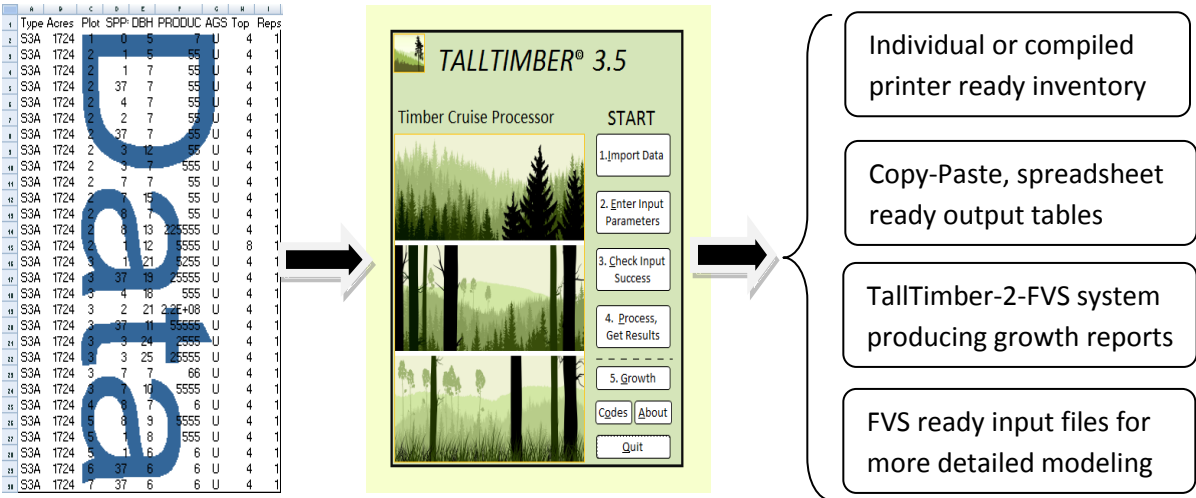


Figure 1. Timber cruise data is imported into TallTimber 3.5, which then converts the data into a suite of information products, including growth reports as a standard component of a regular inventory. It also produces FVS-ready input files that can be stored and shared for further growth and yield modeling efforts.



TallTimber 3.5 Input Data Formats ([Videos 1 & 2 on Playlist](#))

TallTimber will accept and import cruise data from Excel spreadsheets and comma-delimited text files. Those collecting datasets with Timberpad version 2.0 and newer may not need to read this section as carefully as its text output is already in the correct format (see the Timberpad supplement at the back of this document for more information on the comma-delimited file format). The columns and order of data are identical whichever data format you use. Text files must end in ".txt", however.

	A	B	C	D	E	F	G	H	I	J
1	Type	Acres	Plot	SPP#	DBH	PRODUCT	AGS/UGS	Top	Reps	
2	S3A	1724	1	0	5	7	U	0	1	
3	S3A	1724	2	1	4.2	6	A	0	1	
4	S3A	1724	2	1	4.4	6	A	0	1	
5	S3A	1724	2	37	4.7	6	A	0	1	
6	S3A	1724	2	4	5.1	5	U	0	1	
7	S3A	1724	2	2	4.3	5	U	0	1	
8	S3A						A	0	1	
9	S3A						A	0	1	
10	S3A						U	0	1	
11	S3A						U	0	1	
12	S3A						A	0	1	
13	S3A						A	0	1	
14	S3A	1724	2	8	13.3	22555	A	0	1	
15	S3A	1724	2	1	17.4	2222555	A	0	1	
16	S3A	1724	3	1	10.9	22255	A	0	1	
17	S3A	1724	3	3	6.4	666	A	0	1	
18	S3A	1724	3	4	5.9	555	U	0	1	
19	S3A	1724	3	9	16.4	1234555	A	0	1	
20	S3A	1724	3	3	6.2	666	A	0	1	
21	S3A	1724	3	3	6.3	666	A	0	1	
22	S3A	1724	3	3	5.9	666	A	0	1	
23	S3A	1724	3	7	6.2	66	A	0	1	
24	S3A	1724	3	7	7.8	5555	U	0	1	
25	S3A	1724	4	8	7.1	665	A	0	1	
26	S3A	1724	5	8	8.3	5555	U	0	1	
27	S3A	1724	5	1	6.8	666	A	0	1	
28	S3A	1724	5	1	7.4	6666	A	0	1	
29	S3A	1724	6	37	7.3	2222	A	0	1	
30										
31										

Figure 2. This Excel dataset shows six points/plots and uses TallTimber's default species codes. Row 1 contains the required header fields, while row 2 has the first line of data. DBH (column E) is to the first decimal place, but could be an integer value. The AGS/UGS field (column G) can be blank, but all others must be filled out. Top DIB values must be 0 if no Top estimate is made, as opposed to null, which is not allowed. Plot requires an integer value.



One item that is important when importing Excel datasets is that the data, including the header row, must be made into a named-range called "Data" (again- only when the Excel format). This named-range concept is just a tool within all versions of Excel that allows you to reference a particular set of cells and give them any name you want. You can create a named-range by selecting cells in Excel and then typing the name in the "Name Box" in the upper left corner of the spreadsheet, located below the ribbon. Creating a named-range is quite easy, you just need to do it once to get the hang of it, see Figure 2.

	A	B	C	D	E	F	G	H	I	J
1	Type	Acres	Plot	SPP#	DBH	PRODUCT	AGS/UGS	Top	Reps	
2	S3A	1724	1	0	5	7	U	0	1	
3	S3A	1724	2	WP	4 6		A	0	1	
4	S3A	1724	2	WP	4 6		A	0	1	
5	S3A	1724	2	BS	5 6		A	0	1	
6	S3A	1724	2	BF	5 5		U	0	1	
7	S3A	1724	2	HE	4 5		U	0	1	
8	S3A	1724	2	BS	5 66		A	0	1	
9	S3A						A	0	1	
10	S3A						U	0	1	
11	S3A						U	0	1	
12	S3A						A	0	1	
13	S3A						A	0	1	
14	S3A						A	0	1	
15	S3A	1724	2	WP	17 22222555		A	0	1	
16	S3A	1724	3	WP	11 22255		A	0	1	
17	S3A	1724	3	RS	6 666		A	0	1	
18	S3A	1724	3	BF	6 555		U	0	1	
19	S3A	1724	3	PB	16 1234555		A	0	1	
20	S3A	1724	3	RS	6 666		A	0	1	
21	S3A	1724	3	RS	6 666		A	0	1	
22	S3A	1724	3	RS	6 666		A	0	1	
23	S3A	1724	3	HM	6 66		A	0	1	
24	S3A	1724	3	HM	8 5555		U	0	1	
25	S3A	1724	4	RM	7 665		A	0	1	
26	S3A	1724	5	RM	8 5555		U	0	1	
27	S3A	1724	5	WP	7 666		A	0	1	
28	S3A	1724	5	WP	7 6666		A	0	1	
29	S3A	1724	6	BS	7 2222		A	0	1	
30										
31										

Figure 3. This dataset shows the same 6 points/plots as in Figure 2, except it has alpha species codes and integer DBH values. Row 1 contains the required header fields, while row 2 has the first line of data, the 0-tally point consistent with Figure 2. Alpha species codes must be remapped after the dataset is imported into TallTimber the first time. TallTimber 3.5 will then retain your species code settings if the "Keep My Codes" functionality is used.



Two examples of TallTimber datasets are shown in Figures 2 and 3. The Figure 2 dataset uses TallTimber's default numeric species codes and has DBH entered to the first decimal point (generally only important in growth modeling), while Figure 3 shows data with some alpha codes and integer values for DBH. When using your own species codes, you are required to map your codes to the TallTimber default codes after importing the data. It's a simple, one-time process and allows experienced timber cruisers to work with the same codes they may have used in the past. See pages 10-11 for more information.

TallTimber is delivered with example datasets. Excel format file headers can be copied and pasted into new datasets for the Excel input data option. As mentioned, txt, xls, or xlsx files will work with TallTimber's import routine. TallTimber-ready datasets do not have tree ID numbers or the prism/plot size; this information is handled within TallTimber. Table 4 below shows the format and length for each heading (column) in an Excel dataset, providing comments for better understanding. An example of a text file section is shown on page 72.

Column Heading	Formats Accepted	Max. Length	Comments
Type	Text only	26	Type, stand, strata, property or however plots get aggregated
Acres	Numeric	15	Area units are assumed to be acres. Decimal places are allowed
Plot	Integer Only	4	Can be longer than 4, but FVS is limited to 4 characters (9999)
SPP#	Integer or Text	2	Integer or alpha codes, either the default integers or other codes defined by you
DBH	Numeric	2	Integer or to one decimal place, 0.5 to 99 inches
Product	Text or Integer	14	Combinations of integers from 1 to 7, but can be text formatted or a general number, no decimals.
AGS/UGS	Text	1	"A" ,"U", "C", or "L", can be left blank
Top	Integer	2	Diameter Inside Bark at the limit of merchantability, 0 is an option, cannot be null.
Reps	Integer	2	Rarely used, a multiplier for a given tree entry helpful for plantations

Table 4. TallTimber datasets have nine columns (fields) with the headings shown above. All must be filled in, except for AGS/UGS which can be blank. The Top field directs how TallTimber will calculate the top diameter of the tree bole. If a non-zero value is entered, TallTimber will taper the end of the tree to that value. When Top is set equal to 0, TallTimber uses empirically derived taper rates to estimate the top DIB diameter of the tree.



Remember, integers are whole numbers as compared to numbers with decimal places. References to the word numeric in Table 4 means both whole numbers and numbers with decimal places. When we say "text" format, we mean items that sort alphabetically and while usually letters, can also be numbers that are treated as text. For example, when you have a number in a text string; they will be viewed as symbols like in a stand type "H3B". The product field has numbers (1 to 7) that are combined into a string from 1 to 14 characters long. It can be viewed as either a number or a string by Excel, as long as there are no additional characters (no 0's or .'s). Text strings in Excel will default to a left-justified position while the default for numerical data is right-justified, but it doesn't matter as long as the contents are combinations of the characters 1 through 7.

While not the exclusive method by any means, many of the large scale timber cruises conducted in the Northeast and Lake States over the past 30 years have been done with the 8' multiproduct section cruising method. This method requires cruisers to assess each section of the tree from the stump to the limit of merchantability, as specified in the cruise design, or manual of procedures associated with the field work. TallTimber 3.0 also uses this approach, and accommodates up to seven products and fourteen sections in any order. While the cruise designer can freely determine what the product specifications will be, TallTimber's reporting process will create reports that label the products as shown in Table 5 on the following page. If the cruiser calls Veneer for a topmost section in the tree, that's how it will be computed.

TallTimber does not determine specifications, but the standard reporting accommodates board foot units for product codes 1-4, and cord/ton units for product codes 5-6. Additionally, the Grid Data functioning within TallTimber offers cubic foot estimates for product codes 1-4 and cord/ton estimates for product 7 (cull). Grid Data buttons exist on the individual report form, and allows you easy access to spreadsheet-ready tables of estimates for your own analysis and development. Grid Data tables include columns for the log rule, the cubic foot volume equation, and the conversion rate of cubic feet per cord. They can be copied and pasted into a spreadsheet, or just exported directly to Excel via the "external data" tab if using the full version of MS Access (people using Access Runtime will have the copy and paste option). Board foot products are reported in 3 log rules; International 1/4", Scribner, and Doyle.

A closing comment on multiproduct cruising and TallTimber. Cruises can be designed many ways, but when assigning products and heights to standing trees, there will be some level of estimation bias. Visibility may be restricted, defects are viewed from a distance and mostly from below, and upper inside bark diameters are ocular guesses. One of the areas that is



also estimated occurs with partial sections, either at the top of the tree or somewhere else along the products. Well run cruises will have an agreed upon system for handling these factors, such as rounding down on the top section of the tree or rounding up on product.

Product Section Code	Product Heading	Unit of Scale	Comments on Individual Section Codes
1	Veneer	Bd ft., cubic ft.	Highest grade products, rotary/slicer logs
2	Saw log	Bd ft., cubic ft.	Generally grade 2 or better quality
3	Tie/Pallet	Bd ft., cubic ft.	Generally a number 3 or lower grade log
4	Boltwood	Bd ft., cubic ft., cords, tons	Also has been used as peeler or flooring log, small diameter with high quality is typical
5	Pulp	Cords, tons	Section that has no potential for grade appreciation
6	Potential log	Cords, tons	Section that is pulp because of size alone, also defined as growing stock sections in some cruises
7	Cull	Cords, tons	Cull estimates only available as Grid Data output

Table 5. Product codes used in column F will be interpreted by TallTimber as shown, with units of measure listed. The Grid Data functionality is where cull values (code 7) are available.

Converting Height-Style Data Into TallTimber Format - An Important Reminder!

This format discussion ends with a description of how you can format data collected with heights alone into TallTimber ready input. We have worked with many styles and structures of timber cruise data and understand that everyone doesn't use the multi-product format. TallTimber has additional capacity to process those datasets as well, which is how it successfully imports Timberpad data collected in Saw-Pulp Height mode. Here's how it works.

If you have the height above the ground at which saw material ends and the height of where pulp material or merchantability ends, you have enough information. The coding works as follows and results in a single, 6-character string. The number "9" is used to signal this format style. We show it below for 1) a tree with 57 feet of pulp only, 2) a tree with a 25-foot saw height and a total merchantable height of 57 feet, and 3) a cull tree with no sawlog or pulp material. The merchantable lengths are limited to 2 digits, or 99 feet.

- 1) tree with pulp only: 9, 00, 9, 57 = "900957" is the PRODUCT value
- 2) tree with both saw and pulp: 9, 25, 9, 57 = "925957" is the PRODUCT value
- 3) tree with cull only, non-merchantable: 9, 00, 9, 00 = "900900" is the PRODUCT value



Working with TallTimber: Step 1. Import Data ([Video 3 on Playlist](#))

TallTimber has a five-step main menu that leads you through the steps necessary to create and compile your own self-titled, inventory reports. This may or may not include growth report production using the US Forest Service's FVS growth model. In the case where no growth modeling is done, it is a four-step process as can be observed on the main switchboard shown in Figure 6. While it is not as simple as just clicking four or five buttons, it is surprisingly simple to produce reports or access tables of spreadsheet ready output. There are checks in place along the way to help you stay in touch with the process. Let's start by following Step 1: Import Data.

Clicking the import button located under “Start” opens a File Explorer window which lets you navigate to the Excel spreadsheet or text file where your data resides. Select the appropriate input file with your mouse and the File Explorer will close, followed by the import process. You will be notified of success with a message box titled “Successful Import and Reminder”. The reminder is that either the default settings within TallTimber have been restored, or that your prior specifications have been maintained, as described in the next paragraph.

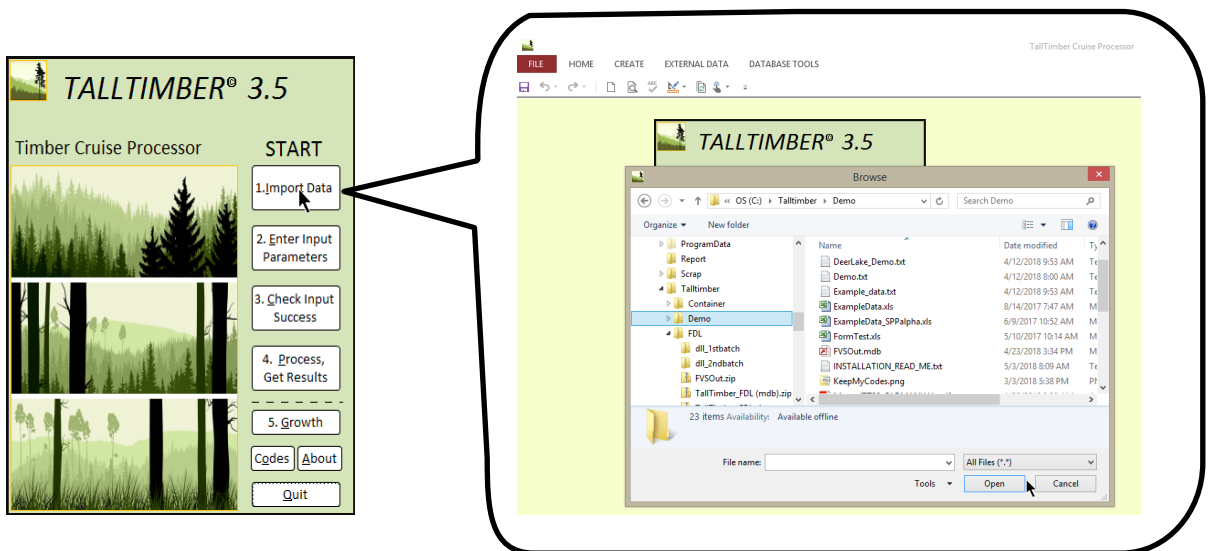


Figure 6. Importing your field tally into TallTimber uses the Windows File Explorer as shown above. Your data can be in Excel spreadsheets with versions from Excel 97 to current, or comma-delimited text. Successful imports conclude with a Message Box telling you that it was successful and reminding that either default settings were restored or your codes have been maintained. You also may be notified of formatting problems that need to be resolved.



The settings we speak of here are related to species codes, wood density modifications (pounds per cubic foot), cubic feet per cord, product merchandizing, and other options in Step 2. **If you have modified these settings and want to keep your adjustments, you can tell TallTimber this by checking the "Keep My Codes" box on the TallTimber Inputs form (Step 2) shown on the following page.** The dialogue box appearing after the Step 1 Import reacts to whether this box was checked or not.

Keep in mind Table 4 when trying to diagnose a data format error. It is ok to have alpha species codes, but blank or alpha diameters won't work. Type names must be in text format, not numeric alone ("H3B" is okay, while "3" alone is not okay as number format). Remember to check the example spreadsheet data provided in the setup package and the 0-tally format. **Lastly, remember to get the column headings named correctly when using the spreadsheet input file format. The best way to do this is by copying and pasting from the example spreadsheet file into your own new input file.**



Working with TallTimber: Step 2. Enter Input Parameters ([Videos 4-6 on Playlist](#))

The Inputs form (largest image in Figure 7) is where you enter specific cruise information, shaping the inventory to conform to the standards you choose for the dataset being processed. The only setting that is required is the sample point basal area factor (BAF) for variable-radius points, or the plot size for fixed-radius plots and 100% tally sampling (Item 1 on Inputs form). Be aware that individual datasets are not allowed to use varying BAFs or plot radii across plots, the entered BAF or plot size is for the entire overstory.

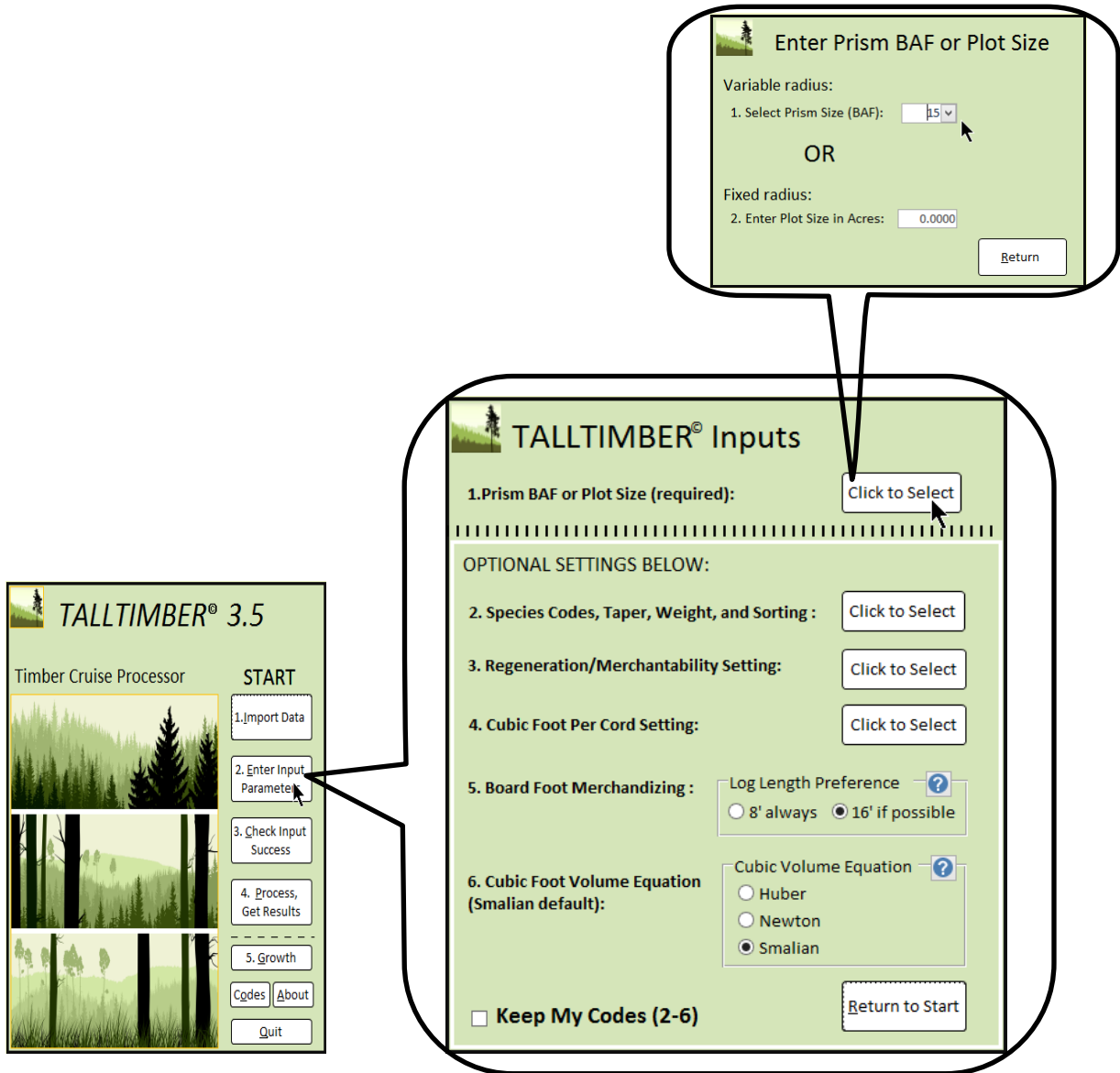


Figure 7. Step 2, Input Parameters, occurs after importing your data. To initiate 100% tally sampling, set the fixed-radius plot size equal to the Acres field value in the input data. For example, a 7-acre patch of 100% tally timber would have both Acres and Plot Size set to 7.



If multiple prism BAFs or plot sizes were used amongst your dataset for overstory trees, you will need to split the data and process the datasets individually as separate inventories. If different species codes are used, TallTimber will instruct you to “map” the species codes before a BAF or plot size can be successfully entered. Mapping codes is either typing or pasting your codes in a provided column. These and other modifications are described here and on the next page (also shown on the YouTube playlist).

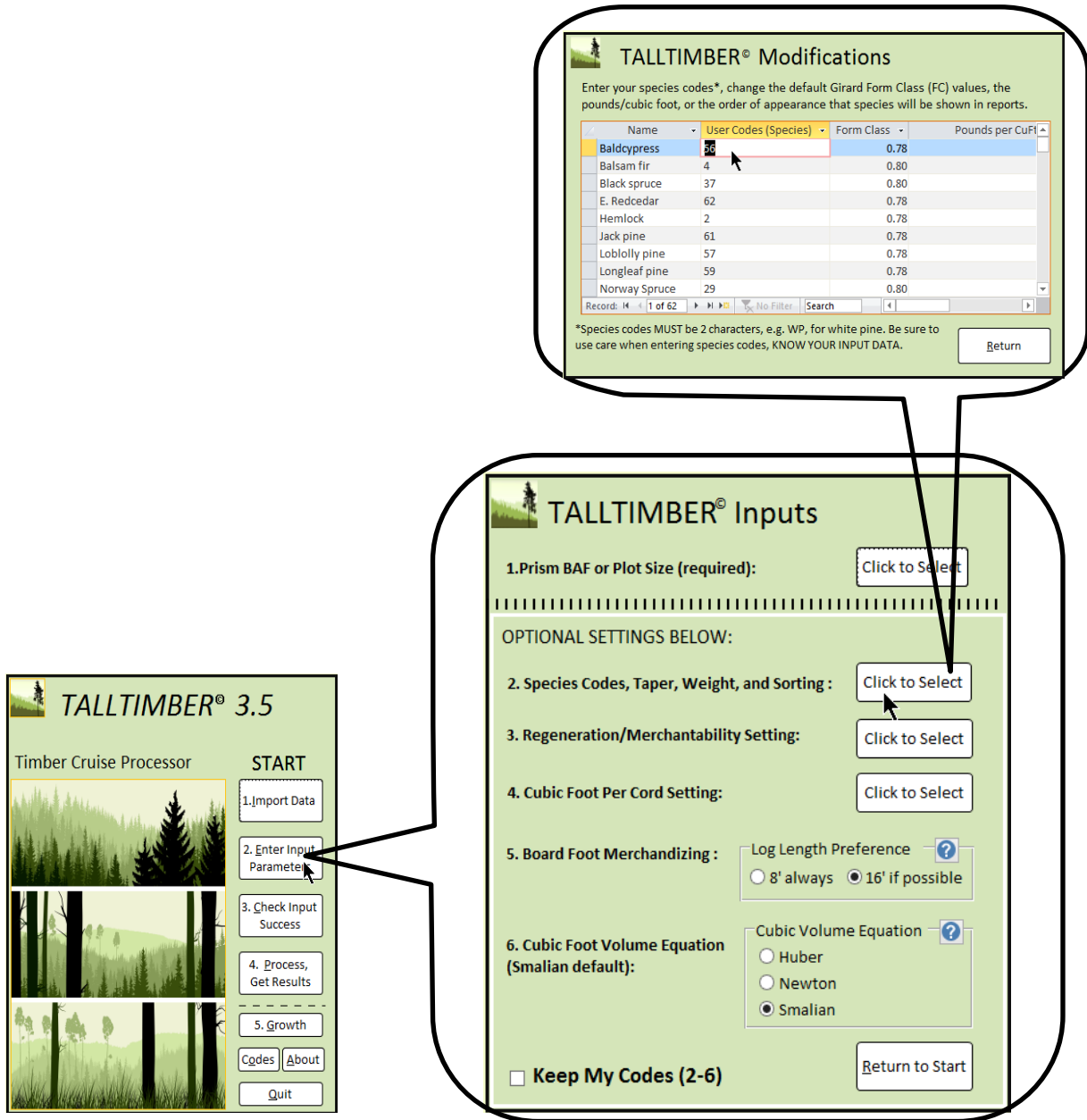


Figure 8. The second item on the Inputs form allows control of species codes and other species values. You can preserve your choices for future inventories via "Keep My Codes."



As mentioned on page 10, TallTimber accommodates differing species codes, lower stem taper (through Girard Form Class), density values, and order of appearance in reports. These changes are species level modifications and are accessible through Item 2 in the Inputs form, located in the Optional Settings section. Clicking Item 2 allows you to work with the Modifications form, seen in Figure 8. Differing species codes can be "mapped in" by either typing each code in for the 62 different species codes, or simply copying and pasting a column from a spreadsheet where you have your own species codes stored into the Modifications form. Similarly, you can have different densities, form class or sort order stored in columns in your own spreadsheet which can be copied and pasted into the modifications form. The density (pounds per cubic foot) values are converted into tonnage estimates based on the net cubic feet per cord value used.

With Item 3 on the Inputs form, TallTimber accepts a fixed-radius regeneration plot (subplot) entered along with the typical overstory point or plot. From a data structure standpoint, these understory trees are simply included in the dataset just like any other trees. Their diameter is required to be smaller than the lower merchantable limit of the overstory trees. The default for this limit is the 5" diameter class, or trees from 4.6" to 5.5" DBH would be considered as trees having merchantable volume. This lower limit along with the expansion factor for that fixed-radius subplot can be changed up or down by clicking Item 3 on the Inputs form and working with the Merchantability and Regeneration form shown in Figure 9 (page 14). These values are changed in one of two controls. The minimum diameter class is set by a combo box (drop down) with a default value of 5, while the expansion factor is set with a text box. A 1/500-acre fixed-radius subplot would have an entry of 500, the trees per acre for an individual sapling or seedling. The default of 1, means no change from the BAF.

TallTimber uses a default of 85 net cubic feet per merchantable cord, a common assumption for a cord of wood in the Northeast (net means that bark and voids are deducted from the 128 cubic foot gross cord). The fourth item on the Inputs form allows you to modify that assumption. This standard varies across regions, and can be impacted by the softwood-hardwood mixture and the common diameter size of wood being sold. Like other units of measure, much of its validity is simply based on past usage and conformity to a standard that people have tacitly agreed to over time. People in the Lakes States commonly use a 79 net cubic foot cord standard, and we've seen softwood dominated regions use a 90 net cubic foot standard. TallTimber's 85 cubic foot assumption can be changed by entering a different value in a combo box as shown in Figure 10 (page 15), but it resets to that standard whenever a new dataset is imported. It also opens a popup window whenever the net cubic foot volume per cord form is closed to confirm any changes made, making these changes purposeful and evident. Lastly, every TallTimber report has the cubic feet per cord assumption printed on it as a last measure to avoid confusion and promote clarity. Checking Keep My Codes preserves this setting as well as the others mentioned.



Merchantability and Regeneration

MERCHANTABILITY- TallTimber assumes DBH classes straddle the integer value they represent. For example, TallTimber uses a default minimum DBH of 4.56" for the merchantability threshold. This is represented as the 5" DBH class, trees from 4.56"-5.55" DBH are in this class. You can change this below:

Minimum DBH Class for Merchantability:

REGENERATION- (This section for FVS users only). TallTimber's default method is that all trees, regardless of size, are expanded according to the BAF or PLOT size entered in the "Input Parameters" process (the step after importing data). To give trees below the Minimum DBH for Merchantability (shown above) a different expansion factor (such as 500 for a 1/500-acre subplot), enter that value in the below text box (1 means no change):

Trees Per Acre Factor for All Regeneration:

TALLTIMBER® Inputs

1. Prism BAF or Plot Size (required):

OPTIONAL SETTINGS BELOW:

2. Species Codes, Taper, Weight, and Sorting:

3. Regeneration/Merchantability Setting:

4. Cubic Foot Per Cord Setting:

5. Board Foot Merchandizing: Log Length Preference
☐ 8' always ☒ 16' if possible

6. Cubic Foot Volume Equation (Smalian default): Cubic Volume Equation
☐ Huber
☐ Newton
☒ Smalian

☐ Keep My Codes (2-6)

Figure 9. The third item on the Inputs form controls the minimum DBH class for merchantability along with the expansion factor to be used for trees below the minimum diameter class. There are two input controls that you work with in this regard. You can change either one or both, depending on the specifications.



TALLTIMBER® 3.5
Timber Cruise Processor

START

- 1. Import Data
- 2. Enter Input Parameters
- 3. Check Input Success
- 4. Process, Get Results
- 5. Growth

Codes | About | Quit

Net Cubic Foot Volume Per Cord

TALLTIMBER estimates the cubic foot volume in each 8' section in the data. These cubic foot volumes are then converted into 85 cubic foot net cords by default. No cubic foot volume equations are perfect for all trees, and some users may wish to adjust them based on their experience. Also, some regions use different standards for the number of NET cubic feet in a cord. Lake States users will often use a 79 cubic foot cord, while others may use 90 or 95. This adjuster allows a user to change the numerator in the ratio of NET cubic feet per merchantable cord.

PLEASE BE AWARE THAT THIS VALUE IS RESET EVERY TIME YOU CLOSE THIS FORM, WITH A DEFAULT OF 85. BE SURE TO HAVE IT SET TO WHAT YOU PREFER WHEN YOU CLICK THE RETURN BUTTON.

Cubic Feet Per Cord:

TALLTIMBER® Inputs

1. Prism BAF or Plot Size (required):

OPTIONAL SETTINGS BELOW:

2. Species Codes, Taper, Weight, and Sorting:

3. Regeneration/Merchantability Setting:

4. Cubic Foot Per Cord Setting:

5. Board Foot Merchandizing: Log Length Preference
☐ 8' always ☒ 16' if possible

6. Cubic Foot Volume Equation (Smalian default): Cubic Volume Equation ☐ Huber
☐ Newton
☒ Smalian

☐ Keep My Codes (2-6)

Figure 10. The fourth item on the Inputs form accommodates changing the cubic foot per cord assumption, which is 85 by default, and resets whenever a new dataset is imported. This is an optional change.



TallTimber processes section data for each individual tree, and provides options as to how this is done. One of these options is "log length preference" and it is important because it impacts the board foot volume estimates produced. Because the scaled yield of a log is limited by the diameter of its small end, scaling two contiguous 8-foot logs individually will produce a different board foot estimate than if scaled as a single 16-foot log unless they taper as the log rule assumes. More specifically, there is less slabbing deduction applied by Doyle and Scribner log rules when scaling two individual 8-foot sections as compared to when they are scaled combined into a 16-foot log (these rules assume a straight cylinder). Of the three TallTimber log rules, the impacts tend to be greatest for Doyle, then Scribner and least for International $\frac{1}{4}$ ", which assumes $\frac{1}{2}$ " taper per 4-foot section. The impact of this choice varies by inventory, but can be quite substantial for Doyle and Scribner log rules.

TallTimber provides you a choice of two "log length preference" modes as shown as the fifth item on the Inputs form (Figure 11). The default is shown as "16' if possible" while the alternative is shown as "8' always". The default, 16' if possible, is also called "merchandizing mode" because it seeks to make 16' logs when it can. For example, in the default mode a tree with a product code of 1223555 (a 7-section tree with "veneer-saw-saw-tie-pulp-pulp-pulp")

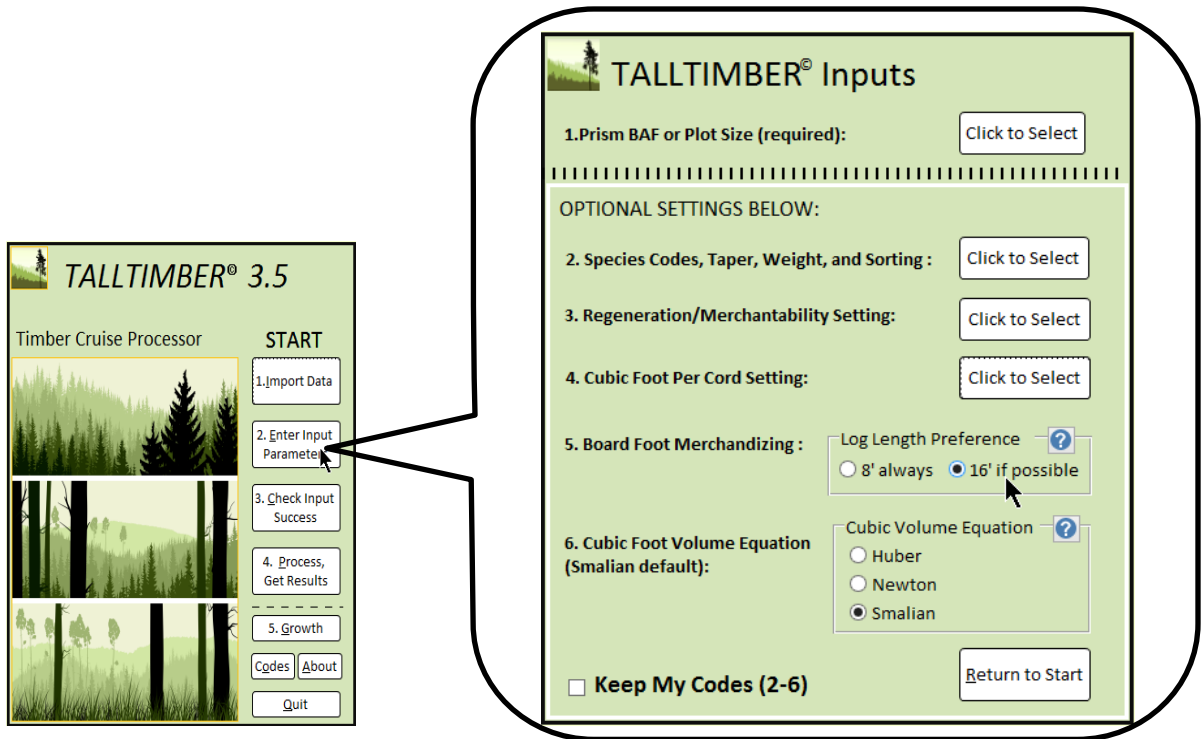



Figure 11. Board foot merchandizing is the fifth option on the Inputs form. This choice is related to how TallTimber applies log rules internally, and is in "merchandizing mode" (16-foot if possible) by default.



products and 56 feet of merchantable bole) will have the 2nd and 3rd sections scaled as a single 16-foot log. The first and fourth sections (veneer and tie/pallet, respectively) are scaled as 8-foot logs as they have no adjacent sections of similar product. The other option, “8’ always”, takes each section independently and produces estimates as if each section were bucked into individual 8’ bolts. Additional log length preference help can be accessed by clicking on the  icon shown in Figures 11 and 12 by the Log Length Preference box.

Traditional forest mensuration literature^{1,2,3} profiles a variety of methods to estimate the cubic volumes of felled or standing trees. Basic discussions cover the idea of estimating bole

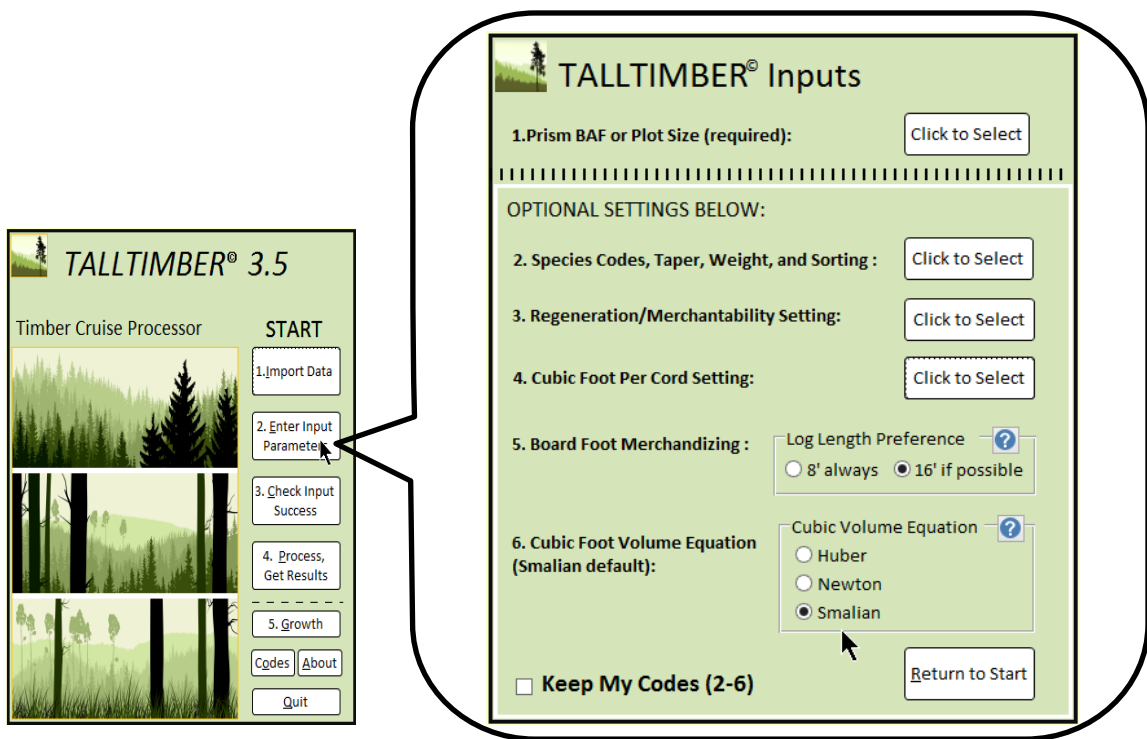



Figure 12. The cubic foot volume equation option is listed as the 6th item on the Inputs form. It provides cubic volume equation choices aligning with formulas from the forestry literature. Smalian’s equation is the default, with Huber’s or Newton’s equations available by selecting their respective radio buttons shown above.

¹ Clutter, et al. 1992. Timber Management: A Quantitative Approach. Kreiger Publishing, Malabar, FL.
² Avery, T.E. and H.E. Burkhart. 1994. Forest Measurements. McGraw-Hill Inc., NY.
³ Forestry Handbook: 2nd Edition, edited by Karl Wenger for the Society of American Foresters. 1984. John Wiley & Sons, NY.



volumes as approximations of more uniform geometric solids, applying the formula of log cross section area times log length to estimate solid volume. Of course trees aren't uniform, and getting the true average cross section area is generally impractical because it would require taking many slices of the tree section being measured. The three formulas most often referenced are Huber's, Newton's and Smalian's. Smalian's is the most commonly used as it does not require a midpoint measurement and its bias can be mitigated by keeping bole sections short. The 6th item on the Inputs form provides the three equations as options for computing cubic foot volumes, with Smalian's used as the default. This choice is printed on each report page. Unlike the log length preference discussion, all cubic foot volumes computed by TallTimber are at the product section level (8 feet). For most datasets, there is minor differences across the three formulas (low single digit percentages). We have included this option more for instructional purposes. Additional help can be found by clicking the  icon shown in Figure 12 (previous page), by the Cubic Volume Equation box.

Working with TallTimber: Step 3. Check Input Success ([Video 7 on Playlist](#))

We've built TallTimber in a way that allows some checking to make sure the data has been imported properly, a measure twice and cut once mentality. Step 3 is where you can take the time to make sure the data is being represented correctly. Clicking on Step 3 opens the Profile Report, a report on the partially completed data workup. It allows operators to scroll through the strata, making sure they are named correctly and have the correct number of acres and points. For example, a typo of a stand/stratum name on one tree record in the spreadsheet data will result in a new, erroneous stand/stratum. The Profile Report mitigates the chances of these types of mistakes, but it is optional.

The following idea is important enough to us that we want to give it its own paragraph and this somewhat awkward topic sentence. The Profile Report shows how many 0-tally points are in the dataset. This insight is a critical piece as 0-tally points are generally among the most influential points in any stratum, and often any cruise. Moreover, 0-tally points are often where mistakes are made when datasets are shared electronically and communications falter. On industrial-size cruises, it's good practice to keep track of this information, as it helps understand how the sample frame treated non-forest and was deployed to the real world sampling of roads, yards, and water conditions where 0-tally is common.

A minor point regarding the column titled "# of Tree Records". This column is a count of rows in the spreadsheet dataset for a given stratum or stand, which contrasts with the columns "Max Trees/Point" and "Min Trees/Point" which account for the Reps value. For example, a point may have eight tree records, but twelve trees if there was a Reps field value of 5 in one of the tree records $(7 \times 1) + (1 \times 5) = 12$. While sparingly used, Reps is helpful to cruisers in plantations and softwood thickets where a cluster of trees of the same species, diameter, and product exists on the same point. Max and Min capture the tally spectrum.



Lastly, for cruises with five or more strata, it will be necessary to scroll down the report to view them all. With more than four strata, the scroll bar should appear on the right hand margin, but can be missed until operators get used to viewing the report. Figure 13 shows an example with four strata, so the scroll bar is not present.



Figure 13. The Profile Report provides broad strata or stand level metrics related to the input dataset. This is an optional, but suggested, step on the way to producing reports.



Working with TallTimber: Step 4. Process & Get Results ([Videos 8-9 on Playlist](#))

TallTimber is built in a fashion that allows two different mindsets with respect to getting information out of it. This is the result of how our projects have generally worked out. There are situations when you want to view a single report, pop in and out of different reports, or

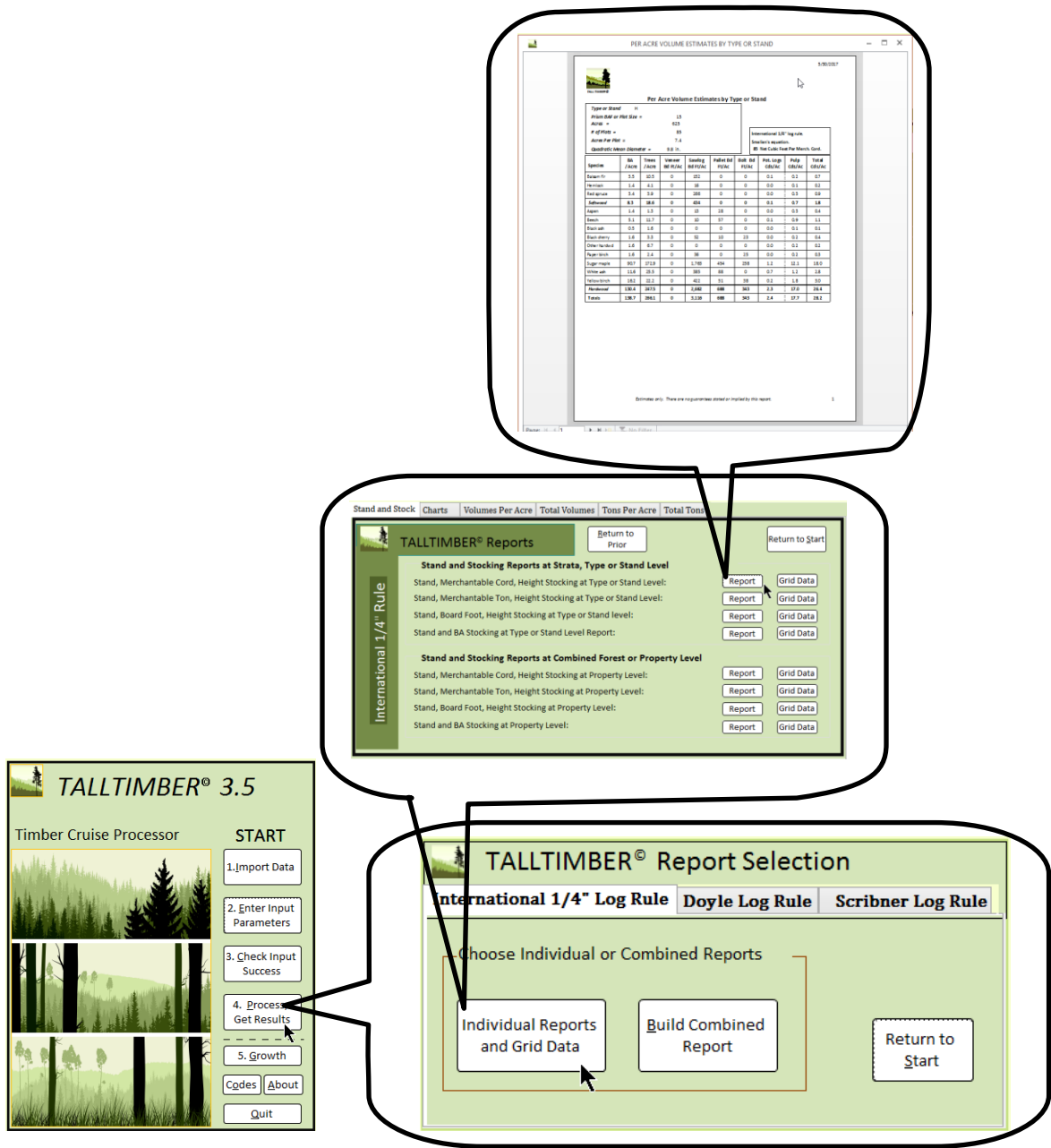


Figure 14. Individual Report mode allows operators quick access to single reports or copy/paste table output.



just work with the Grid Data output in a spreadsheet on your own. That is what we call Individual Report mode, and fits well when you have less time and may revisit the inventory later on. There are other times when you want to create an inventory report masterpiece, the final report you present your client or create for your own file. This style of report has a cover sheet, a second page with codes and assumptions, and then a compilation of all the sub-reports you find important enough to include. This is Combined Report mode and uses what we sometimes call the compiler. The next few pages take you through Step 4, which is about producing output with TallTimber in either Individual Report or Combined Report modes. Figure 14 (previous page) shows Individual Report mode used to create a report.

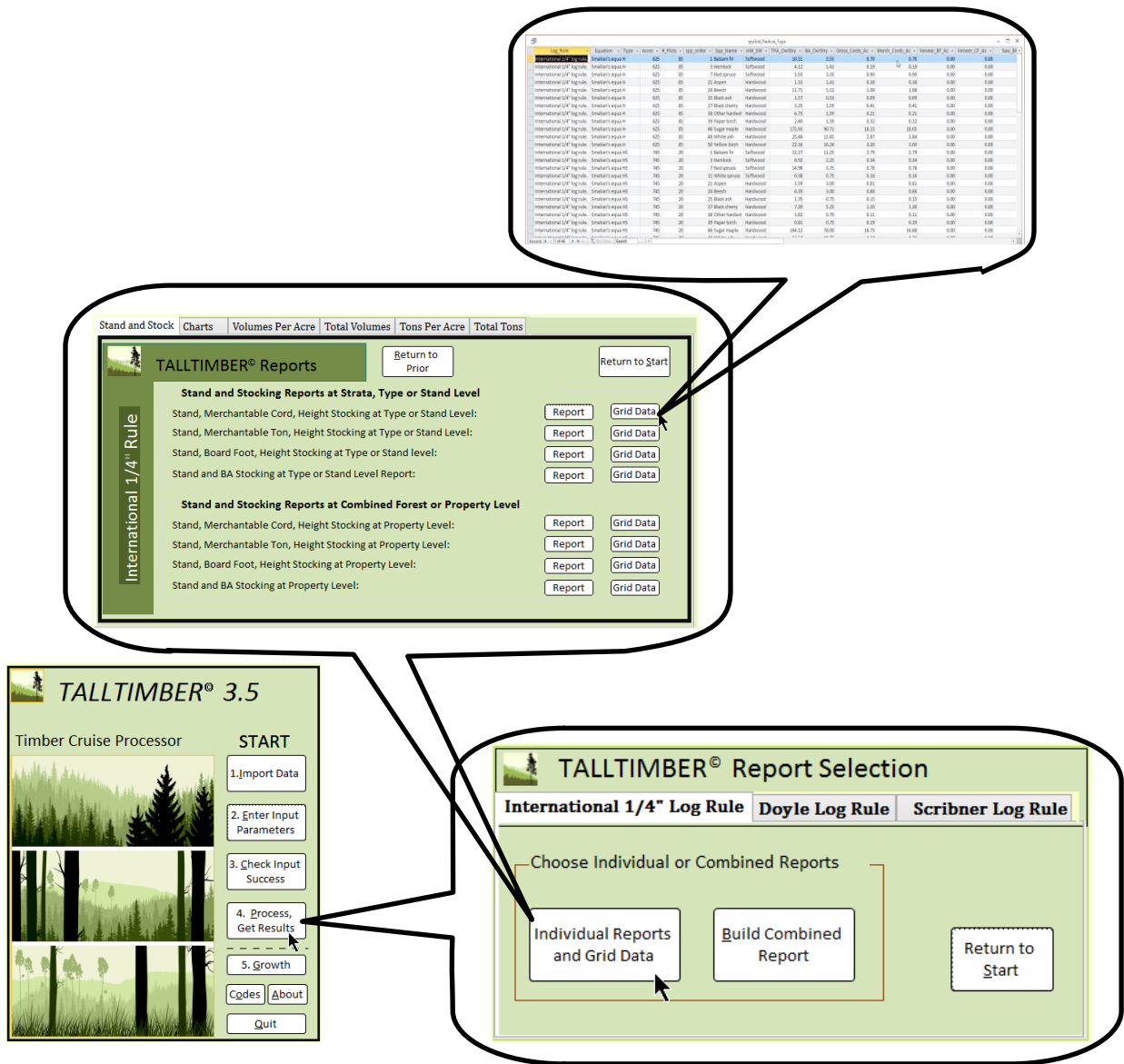


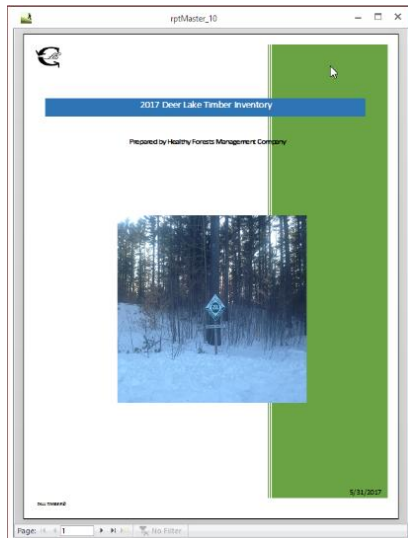
Figure 15. Individual Report mode allows operators to quickly access tabular information as shown above. This can be directly exported or copied and pasted into other documents.



Whether using Individual Report mode or Combined Report mode, the choice of log rule is determined by the tab chosen on the form titled Report Selection (shown in Figures 14 & 15 previous pages). When the Report Selection form opens, the International $\frac{1}{4}$ " tab is selected by default. Operators can easily change this by clicking on the tab for Doyle or Scribner log rules also visible on the Report Selection form.

Individual Report mode has 56 different reports available in each of the three log rules, among which are eight pie charts and eight bar charts. Additionally, Individual Report mode provides a button for producing table data associated with 22 of the 56 reports, one of these tables is shown at the top of Figure 15. The tables can be copied and pasted into a spreadsheet, or directly exported using the External Data menu located on the MS Access ribbon. These tables have several pieces of information not available in the printer ready reports. For example, some tables provide sawn products in cubic foot volumes along with board foot, and cull volumes (associated with the product = 7 code) are also available. These tables provide accessible material for further analysis, charting and development to meet your unique needs.

Combined Report mode provides two flexible input forms that help you create reports. There are 58 reports to choose from among three tabs on the Report Builder form. The Personalization form allows pictures and logos to be entered on the cover page, along with titles and subtitles as shown in Figure 16 (next page).



Personalizing Report Cover Page (All Entries Optional)

[Return to Prior](#)

1. Enter an Appropriate Title:
"2017 Timber Inventory Report of McMahon Family Woodlot"
2. Enter an Appropriate Sub-Title:
"Prepared by Samantha Jones Forestry"
3. Enter image file to enhance cover page (.bmp, .jpg, .png, etc.)
4. Select your company logo for the front page (.bmp, .jpg, .png, etc.)

[Compile and View Report](#)

TALLTIMBER® Report Builder

[Return to Prior](#) [Make Print](#)

Stand and Stock | **Charts** | **MBE, Cords, Tons**

International 1/4" Rule

	Cords	Tons
Per Acre Volumes and Tons Reports at Strata, Type or Stand Level		
Type or Stand Level Volume or Tons Per Acre Report:	Print Order: 6	10
Type or Stand Statistics Report on Per Acre Volumes or Tons:	Print Order: 7	11
Type or Stand Statistics Report with Hdwd/Sftwd on Per Acre Volumes or Tons:	Print Order: 8	12
Per Acre Volumes and Tons Reports with Strata Combined to Forest Level		
Forestwide (Strata Summed as Weighted Avg.) Volume or Tons Per Acre Report:	Print Order: 1	13
Forestwide Statistics Report on Per Acre Volumes or Tons:	Print Order: 2	14
Forestwide Statistics Report with Hdwd/Sftwd on Per Acre Volumes or Tons:	Print Order: 3	15
Forestwide Per Acre Volume or Tons by Diameter Report:	Print Order: 4	
Total Volumes and Tons Reports at Strata, Type or Stand Level		
Type or Stand Level Total Volume or Tons Report:	Print Order: 5	
Type or Stand Statistics Report with on Total Volumes or Tons:	Print Order: 6	
Type or Stand Statistics Report with Hdwd/Sftwd on Total Volumes or Tons:	Print Order: 7	
Type or Stand Level Total Volume or Tons by Diameter Report:	Print Order: 8	
Total Volumes and Tons Reports with Strata Combined to Forest Level		
Forestwide (Strata Summed as Weighted Avg.) Total Volume or Tons Report:	Print Order: 9	
Forestwide Statistics Report on Total Volumes or Tons:	Print Order: 10	
Forestwide Statistics Report with Hdwd/Sftwd on Total Volumes or Tons:	Print Order: 11	
Forestwide Total Volume or Tons by Diameter Report:	Print Order: 12	

ENTER THE SORT ORDER FOR DESIRED REPORTS (1, 2, ...)

TALLTIMBER® 3.5

Timber Cruise Processor

START

1. Import Data
2. Enter Input Parameters
3. Check Input Success
4. Process Get Results
5. Growth

[Codes](#) [About](#) [Quit](#)

TALLTIMBER® Report Selection

International 1/4" Log Rule | **Doyle Log Rule** | **Scribner Log Rule**

Choose Individual or Combined Reports

[Individual Reports and Grid Data](#) [Build Combined Report](#) [Return to Start](#)

Figure 16. Combined Report mode allows building compiled sub-reports in the sequential order of your choosing, along with personalized business logo and imagery for the cover.




The functioning of the Report Builder in Combined Report mode is built to be instinctive, and has a similar layout structure as the Individual Reports form, but there are some obvious differences. The Report Builder is a 3-tabbed form that has blank text boxes that are made for entering numerical values corresponding to the order that you want your sub-reports to be shown in. There are 58 text boxes corresponding to the 58 sub-reports (chart & graph reports included), and you can choose up to 15 of the 58 sub-reports to be included in a “master” report. The 58 contrasts with 56 in the Individual Report mode as there are two growth reports not available in Individual Report mode. These two sub-reports are accessible elsewhere, on the TallTimber 2 FVS form.

Choosing a report means entering a number in the text box next to it, as reports with blank text boxes will not be included. This entering process occurs over the three tabs titled “Stand and Stock”, “Charts”, and “MBF, Cords, Tons” as shown in the center of Figure 16 (page 23), where the “MBF, Cords, Tons” tab is selected and 10 reports are ordered from 1 to 10. For the sake of completeness, we point out that it would be possible for more than 10 to be selected as you can only see one tab in Figure 16. Reports 11 to 15 could be selected on the “Stand and Stock” or “Charts” tabs. In summary, 15 reports of the 58 possible can be included into a combined report, and TallTimber will sort them according to the numbers ordered in the text boxes with empty text boxes excluded from the master report. Reports can be in units of green tons or cords or both for low grade products.

After using TallTimber, you will likely settle in to a certain selection and order of reports that become your preferred standard master report. In anticipation of this, TallTimber stores and retrieves the reports and order from the last master report produced. These values are automatically filled in the text boxes when the Report Builder is next opened. If a different combination of reports is desired, you can easily clear the text boxes by clicking the Trash



icon on the Report Builder form. This erases the data in the text boxes on all three tabs.

If the trash icon is clicked inadvertently, the Undo Arrow icon  can be selected to bring back the erased values.

The top of Figure 16 shows the form that allows operators to customize the master report cover page, along with the resultant report to its right. This enhancement accommodates a title, subtitle, cover picture, and business logo (appearing in the upper left corner of the cover page). However, these customizations are optional entries. Operators do not have to add values to the empty text boxes for titles and the other fields, they can simply click the “Compile and View” button to create the report with a generic cover page. This is not a bad approach until the you have settled into a definite selection of reports and order. Filling out the Personalization form is generally saved for the final version or versions to be printed or otherwise saved. Once the master report is created it can be printed to a pdf, a paper version, or whatever print format currently installed on operators' systems. Closing the master report returns you to the Report Builder form.



The forms shown in Figure 16 also show the stepwise path typical of how you can back out of different locations within TallTimber. All the forms beyond Start have a Return button that allows the you to retreat from your location one step at a time, which is the way we suggest people maneuver within TallTimber. The actual master report has a close button in the upper right hand corner, as is common with MS Windows programs.

TallTimber offers a facility for creating growth projection reports and incorporating them into the process described above with the Report Builder in Combined Report mode. These two reports are only available after Step 5 has been completed, which we describe next as the TallTimber 2 FVS process. This is because it employs the US Forest Service's FVS growth model as it is deployed by the Suppose interface.



Working with TallTimber: Step 5. Growing the Inventory, Including Growth Reports
(Videos 10-12 on Playlist)

One of TallTimber’s most helpful features is that it simplifies the creation of input files and facilitates the use of the US Forest Service’s FVS growth model (Forest Vegetation Simulator), and its Suppose interface. If you have no experience with FVS, skip to the Appendix and read *A Digression on FVS*.

The image shows two screenshots from the TallTimber software. The top screenshot is the 'FVS File Building Inputs' form, titled '1. FVS Input: A-B-C' and 'Fill in the Blanks'. It contains three sections: A. Choose Variant (FVS Variant: LS), B. Combine Points at Stand/Strata Level? (YES selected), and C. Site Quality, File Locations, Year. Section C includes a table with columns for Stand Name, Site Index (SI), Species, Input Files Locations, and Simulation Start Year. The bottom screenshot shows the 'TALLTIMBER® 3.5' main menu with a 'START' button and a list of steps. Step 5, 'Growth', is highlighted. A callout box shows the 'TALLTIMBER 2 FVS' form, which has 'FVS INPUT STEPS' (1. Input Parameters, 2. Check Input, 3. Create Input Files) and 'RUN FVS AND VIEW OUTPUT' (LAUNCH FVS SUPPOSE, View Type Report, View Summary Report, Return to Start). Arrows indicate the flow from the main menu to the FVS form and from the FVS form to the 'LAUNCH FVS SUPPOSE' button.

FVS File Building Inputs (*.loc, *.slf, *.fvs)

1. FVS Input: A-B-C *Fill in the Blanks*

A. Choose Variant
FVS Variant: **LS**

B. Combine Points at Stand/Strata Level?
☒ YES (commonly used) ☐ NO (sometimes used)

C. Site Quality, File Locations, Year

Stand, Type or Strata Name	Site Index (SI)	SI Species	Input Files Locations (where to put the files)	Simulation Start Year
H	entry fields 70	SM	C:\Scrap\	2017
HS	entry fields 60	RM	C:\Scrap\	2017
S	entry fields 50	BS	C:\Scrap\	2017
SH	entry fields 55	RM	C:\Scrap\	2017

Return

TALLTIMBER® 3.5
Timber Cruise Processor

START

- 1. Import Data
- 2. Enter Input Parameters
- 3. Check Input Success
- 4. Process, Get Results
- 5. Growth**

Codes About Quit

TALLTIMBER 2 FVS

FVS INPUT STEPS

- 1. Input Parameters
- 2. Check Input
- 3. Create Input Files

RUN FVS AND VIEW OUTPUT

- LAUNCH FVS SUPPOSE**
- View Type Report
- View Summary Report
- Return to Start

Figure 17. The growth process begins by clicking Step 5, followed by clicking the first button on the TallTimber 2 FVS form. This opens the larger FVS Input form, shown above with the FVS Variant choice being made.



Along with easier FVS input file production, TallTimber creates helpful reports that calibrate FVS cubic foot volume output to TallTimber produced volumes. In this way, operators get growth projections that are calibrated to the inventory they have just collected, which may be different than the regional average information relied upon if using uncalibrated FVS output. Operators can produce growth projection reports that can be added as a last page of the inventory report, or just the input files required for starting a larger growth modeling exercise. Either way, TallTimber accommodates the required inputs for growth modeling an inventory.

After clicking the Growth button (Step 5) on the Start form, the TallTimber 2 FVS process starts with entering basic input data required by FVS. Operators click button 1 on the TallTimber 2 FVS form shown in Figure 18 (next page). The first entry required on the FVS Input form shown at the top of Figure 17 (previous page) is the FVS Variant, the geographic locale of the model growing their data.

After choosing the variant appropriate for their dataset, the next choice is how the individual plots within a stand, type or strata are to be aggregated with respect to the tree list input file (*.fvs files). This is shown at the top of Figure 17 as Item “B. Combine Points at Stand/Strata level?”, a required entry on the FVS Input form. This is a somewhat technical issue to discuss, and most operators should just remember to always select the “Yes” button. We touch on the technical side more in the next paragraph.

In most cases, you will want all points within a stand or strata to be listed one after the other in a single *.fvs file. For example, if you have 175 total cruise points over five stands or strata, you would have just five *.fvs files, one named for each stand or strata in the inventory. When this is chosen, FVS averages plots within a stand/strata equally and produces summarized growth output of plot averages for that stand, type or strata. Occasionally, but not often, you may want to grow each point or plot independently, making a tree list for each point or plot, and then growing them individually. This might be the case if you needed to weight your points or plots differently within a strata or type, meaning you want to control the averaging process outside of FVS.

TallTimber accommodates this possibility, and allows you to choose “No” for item “B. Combine Points at Stand/Strata Level?”. In that case, rather than name the *.fvs file after the strata containing it, TallTimber will name the *.fvs file after the point or plot number, as in 158.fvs (an FVS tree list file for an assumed point #158). Again, this is the exception, and is only included for those growth modelers who have goals different than the typical TallTimber operator. It’s also important to mention as those choosing this option will not be able to use TallTimber’s growth reporting functionality without modification. However, operators making this choice will likely want to build a stratification process that is specific to their unique project, so we suspect this is a non-issue.



FVS File Building Inputs (*.loc, *.slf, *.fvs)

1. FVS Input: A-B-C

Fill in the Blanks

A. Choose Variant
FVS Variant:

B. Combine Points at Stand/Strata Level?
☒ YES (commonly used) ☐ NO (sometimes used)

C. Site Quality, File Locations, Year

Stand, Type or Strata Name	Site Index (SI)	SI Species	Input Files Locations (where to put the files)	Simulation Start Year
H	entry fields 70	SM	C:\Scrap\	2017
HS	entry fields 60	RM	C:\Scrap\	2017
S	entry fields 50	BS	C:\Scrap\	2017
SH	entry fields 55	RM	C:\Scrap\	2017

Return

Figure 18. The FVS Input form allows assigning (A) a model variant, (B) the tree data combination choice, and (C) four variables determining site index, site index species, location of FVS input files, and the year simulation starts. Clicking Return stores these values and closes the Input form.

Figure 18 shows the same FVS Input form from Figure 17, but now filled in for a hypothetical forest and its timber cruise dataset from the Lake States region (variant = LS). We can see that the dataset has four strata; H, HS, S, and SH and was hypothetically cruised in the winter of 2017. By entering 2017, the growth modeling results will include the 2017 growing season, rather than beginning with the 2018 growing season, which would be appropriate if the cruise occurred in the fall of 2017 or the winter of 2018. Operators should be alert to this as it relates to the cruise history of their datasets, making sure they don't give or take a year of growth from their output.

From Figure 18, we also see the site index and site index species assigned to the different strata. Site index information is available through a multitude of online sources, including the Forest Service's FIA (Forest Inventory and Analysis) data and the Natural Resources Conservation Service (NRCS). For our hypothetical forest, we buttressed our professional experience with an NRCS paper on site index titled *Michigan Forestry Conservation Technical Note #23* (2003) and entered the values shown in Figure 18. Lastly, we filled in the text boxes associated with the "Input Files Locations" header with a path statement indicating putting the files in a folder called "Scrap" that is located on the C drive (C:\Scrap\). This last part is facilitated by an explorer window that opens when you click on the Input File Locations text boxes. In that fashion, operators can easily navigate with their mouse to the folder where they want the files written and click OK.



Clicking Return on the FVS Input form stores those values and also checks to see that they have been completely filled out. If not completely filled out, operators are warned of that with a message box that pops up and gives them a choice of returning to complete the Input Form, or close it with incomplete information.

Figure 19 shows the action of Step 2 on the TallTimber 2 FVS form, which simply opens the FVS File Precheck report which gives operators an opportunity to make sure the FVS input files will be created as intended. This is another “measure twice, cut once” step in TallTimber. We want to make sure operators have selected the correct variant, that all the intended strata have been appropriately filled in, and that the 0-tally points are once again accounted for in the FVS input files soon to be created. While this is an optional step, it is suggested to spend a minute looking over the Precheck report.

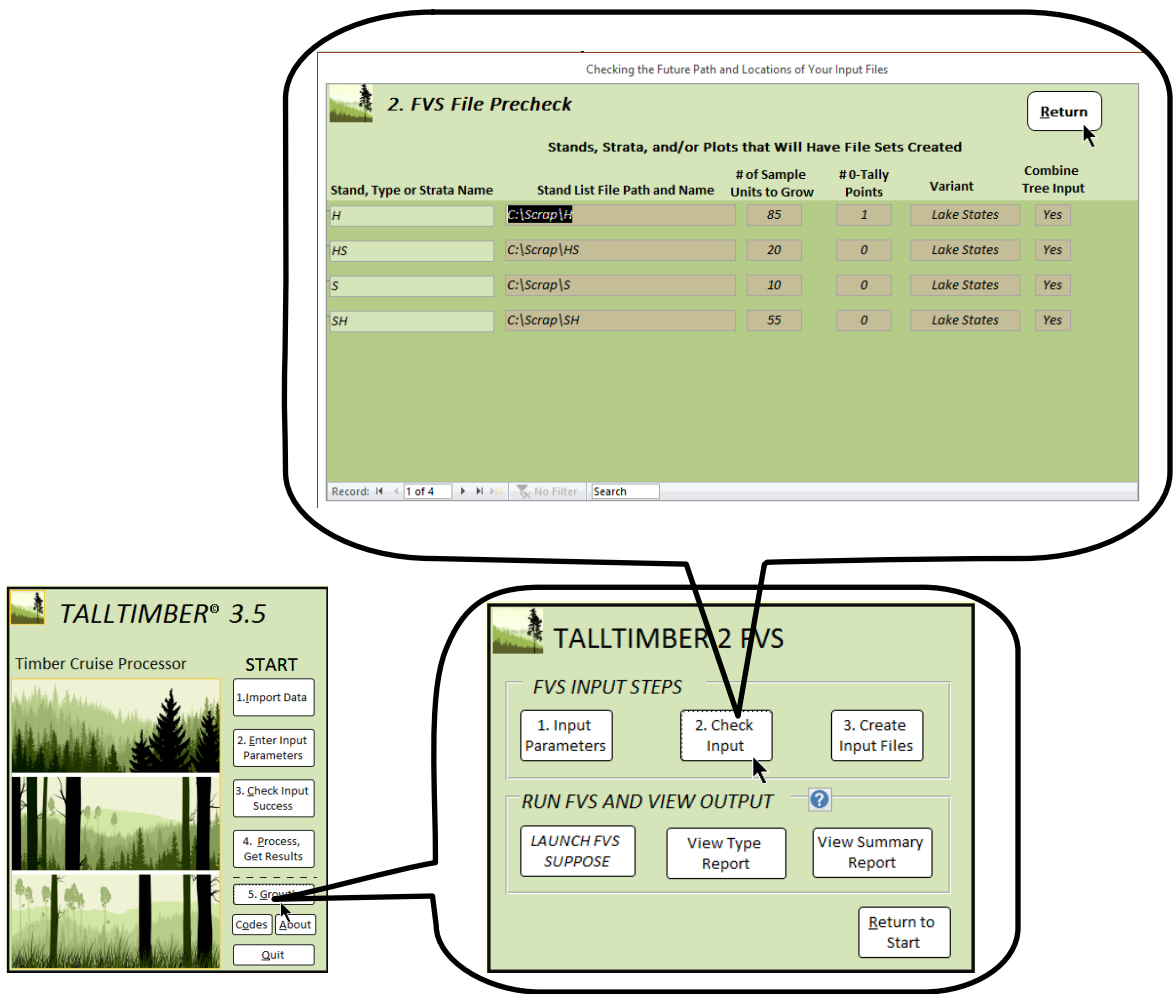


Figure 19. The second item on the TallTimber 2 FVS opens the FVS File Precheck report for operator inspection of their input choices. For example, showing the FVS variant chosen.



The third item on the TallTimber 2 FVS form opens the Build FVS Input Files form, a simple form shown at the top of Figure 20. Clicking the three buttons on this form (Location, Stand, Tree) writes the input files necessary for running FVS to the computer path prescribed earlier. There are three types of files getting written and they are described below from most general to most specific. There is a hierarchy to their structure, with most general (location) moving towards most specific (tree). All three file types are required.

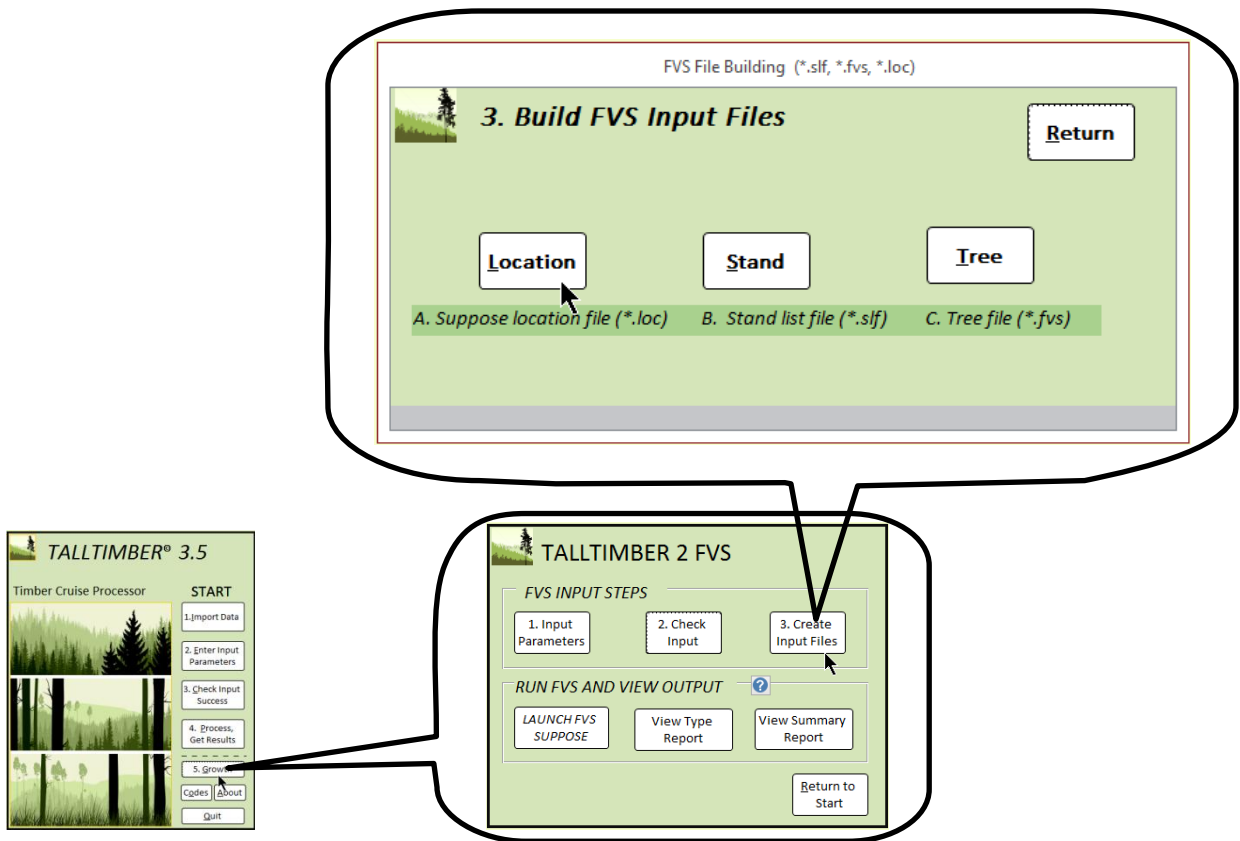


Figure 20. The Build FVS Input Files form executes the building of the FVS input files.

Three FVS File Types:

- Location file: One per inventory, always named “Suppose.loc”. It lists the names of the stands/strata and where on the computer their files reside.
- Stand list file(s): One file for each stand/strata to be grown, have “slf” file extensions. Has site quality information and other stand level attributes.
- Tree file(s): Typically one file for each stand/strata to be grown, but can be as many as there are points/plots. This depends on the aggregation choice made earlier. Has tree data.



After building the input files, the next step is to launch Suppose, the interface operators interact with to run the FVS growth model. If you do not have FVS Suppose installed, you will need to do that before proceeding. FVS can be downloaded from the Forest Service website and installed as a complete package (<https://www.fs.fed.us/fmfc/fvs/software/complete.php>). For more information on growth modeling with FVS Suppose, jump ahead in this manual to the Appendix section titled *A Digression on FVS*.



Regarding FVS, our goal with this manual is to provide an overview of FVS function, and how it integrates with TallTimber via the TallTimber 2 FVS process. Operators having had little exposure to FVS modeling or are just starting their journey with computers can be best served through direct instruction, which is why we’ve worked hard to provide a helpful video resource at the TTimmer YouTube channel (videos are listed towards the end of this document). We recommend that all people, with limited FVS experience or not, check out our instructional videos for better understanding how to use FVS and TallTimber generally. Website addresses for FVS manuals and training are listed in the Appendix and our website.

The top of Figure 21 shows the Suppose interface opened with the stand selection form located on its right after the “H” strata has been selected (highlighted in blue) and added by

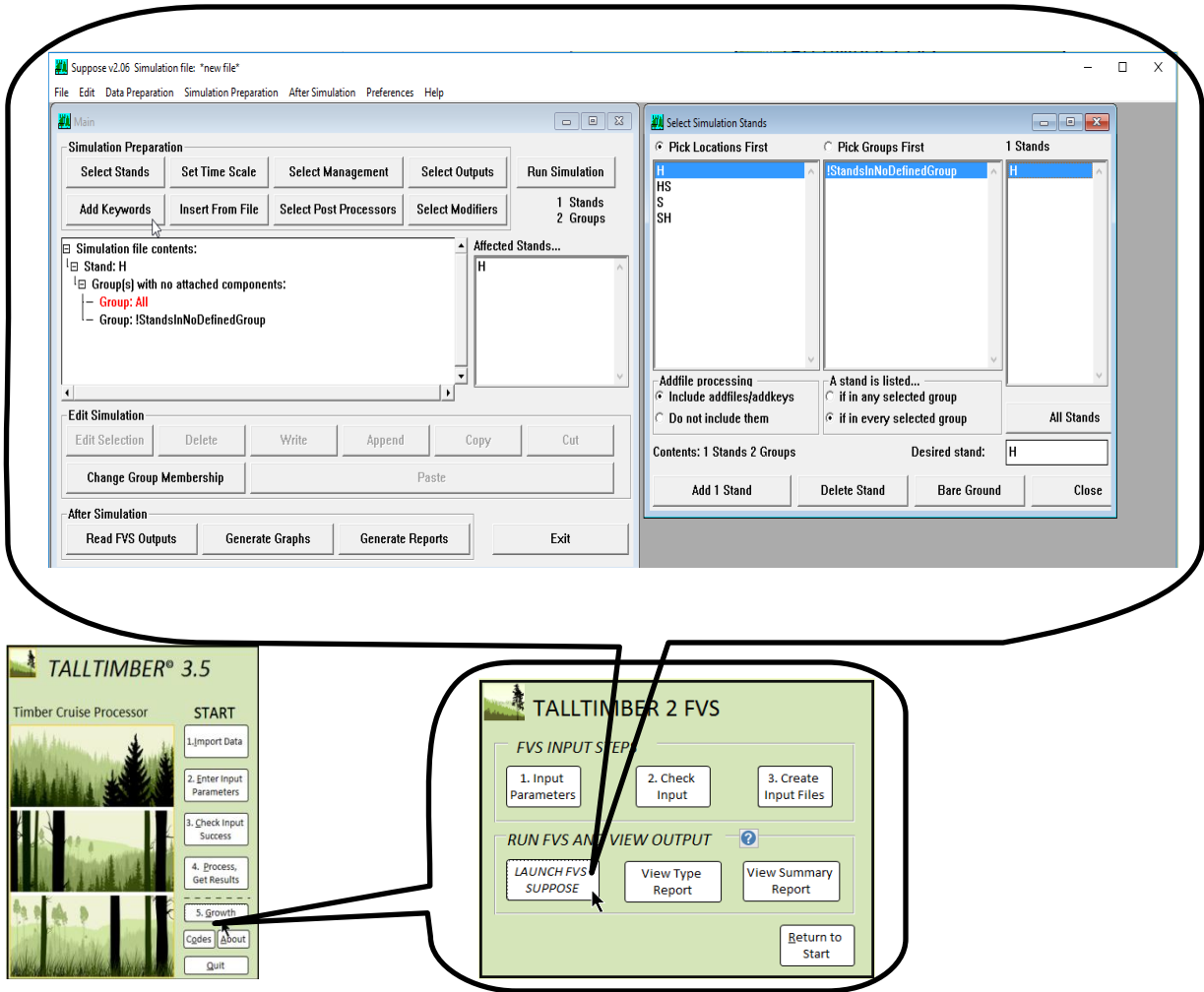


Figure 21. The Suppose interface is launched by clicking the button shown above on the TallTimber 2 FVS form. Next, the “File” menu is chosen and the “Select Locations File” option is used to open the Suppose.loc file. Then the stand is added by working with the Select Simulation Stands form shown to the above right.



clicking the “Add 1 Stand” button. The stand selection form opened after the Locations file (Suppose.loc) was opened through the File menu shown at the top left of Figure 21. The process is one where operators grow each stand or strata in a series of steps, which are then repeated for the next stand or strata (first H, then HS, etc.).

One of the required aspects to make the TallTimber 2 FVS work properly is that FVS needs to send its growth projection output to a database called FVSOut.mdb. TallTimber links to this FVSOut database to make its reports, and if the output is not there, the reports won’t be available. This database was included with your TallTimber purchase, but really is just a blank MS Access database named FVSOut.mdb. So, if you accidentally deleted it, or otherwise don’t have this database, just create a blank database in the mdb format, making sure it is named FVSOut and located within the same folder as TallTimber (C:\TallTimber\FDL). FVS does not currently write to accdb style databases, so the mdb format is key.

While stressing that the FVSOut.mdb is required for successful report production within TallTimber, we add that it is not necessary to simply run an FVS simulation. If it is absent, or not properly linked to TallTimber, FVS will just run and the output won’t arrive at the proper location. This ability to send output to the FVSOut database requires what is called an ODBC connection, a link that allows the FVS model to open FVSOut.mdb and create tables of information in the FVSOut database, a “container” of sorts for database objects. Setting up an ODBC connection is something you only need to do once for FVSOut, and the process is well described in this 2016 Forest Service document (<https://www.fs.fed.us/fmfc/ftp/fvs/docs/gtr/DBSUserGuide.pdf>), and generally shown in Figure 22 (next page) for a 32-bit MS Office installation and 32-bit FVS (the most common version) on a Windows 8 operating system.



If you look closely at the background of Figure 22, you can observe the slightly shaded selections made to start the ODBC process. First, start by navigating to the *Control Panel*, then to *Administrative Tools* folder under *System and Security*, then double click on the *ODBC Data Sources (32-bit)* file which will open a form titled *ODBC Data Source Administrator*. Within the *ODBC Data Source Administrator* form, choose the second tab, *System DSN (NOT User DSN)*. Clicking the Add button will open the form shown in the center of Figure 22 titled *Create New Data Source*. On that form, select the Microsoft Access (*.mdb) option, shown highlighted in blue in Figure 22, then click Finish. Now click Add on form *ODBC Data Source Administrator (32-bit)*.

Clicking Add opens the *ODBC Microsoft Access Setup* form shown in Figure 23. Enter FVSOOut in the blank text box titled *Data Source Name*, and click the Select button, which opens the *Select Database* form shown in Figure 23 (next page). Use the *Select Database* form to navigate to the FVSOOut.mdb database, which must be located in the C:\TallTimber\FDL

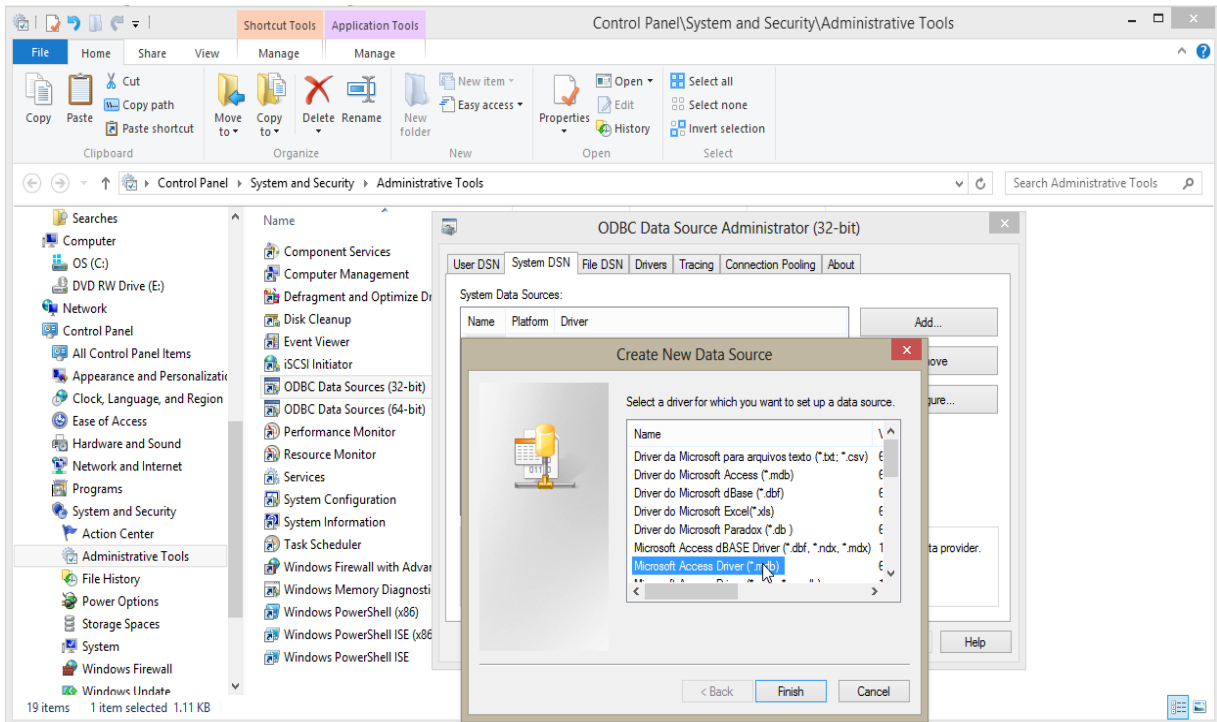


Figure 22. The first steps in creating an ODBC connection and DSN for FVSOOut.mdb start in the control panel.



folder as shown below in Figure 23. After selecting FVSOOut.mdb, click OK on the next three forms, closing up this process and finishing the creation of the Data Source Name and the ODBC connection. The three forms are shown one on top of the other in Figure 23. We repeat that if done correctly, and the FVSOOut.mdb database is not moved or renamed, you will not have to repeat this process again. The DSN made (FVSOOut) is a durable item that exists after you close FVS and shut the computer off.

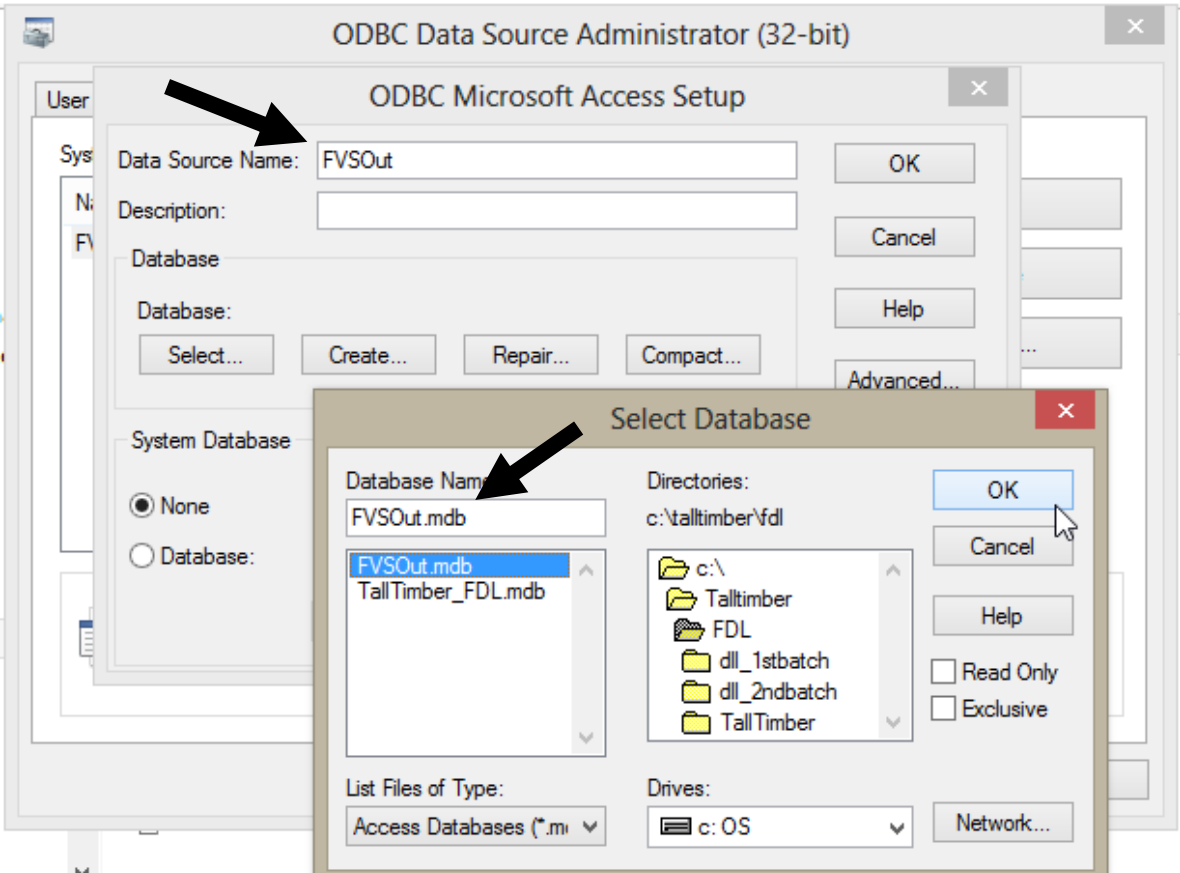


Figure 23. After entering “FVSOOut” in the text box above as a Data Source Name (DSN), clicking the Select button allows us to navigate to the FVSOOut.mdb database located at C:\TallTimber\FDL. Clicking OK is then followed by clicking OK on the ODBC Microsoft Access Setup form, establishing the ODBC connection.



TallTimber is set up to look for the FVSOOut.mdb database in the specific location stated in this manual. Lastly, we add the fact that data source names (DSNs) also work with MS Excel and other types of database file, we use MS Access as it's the most common. It's possible to

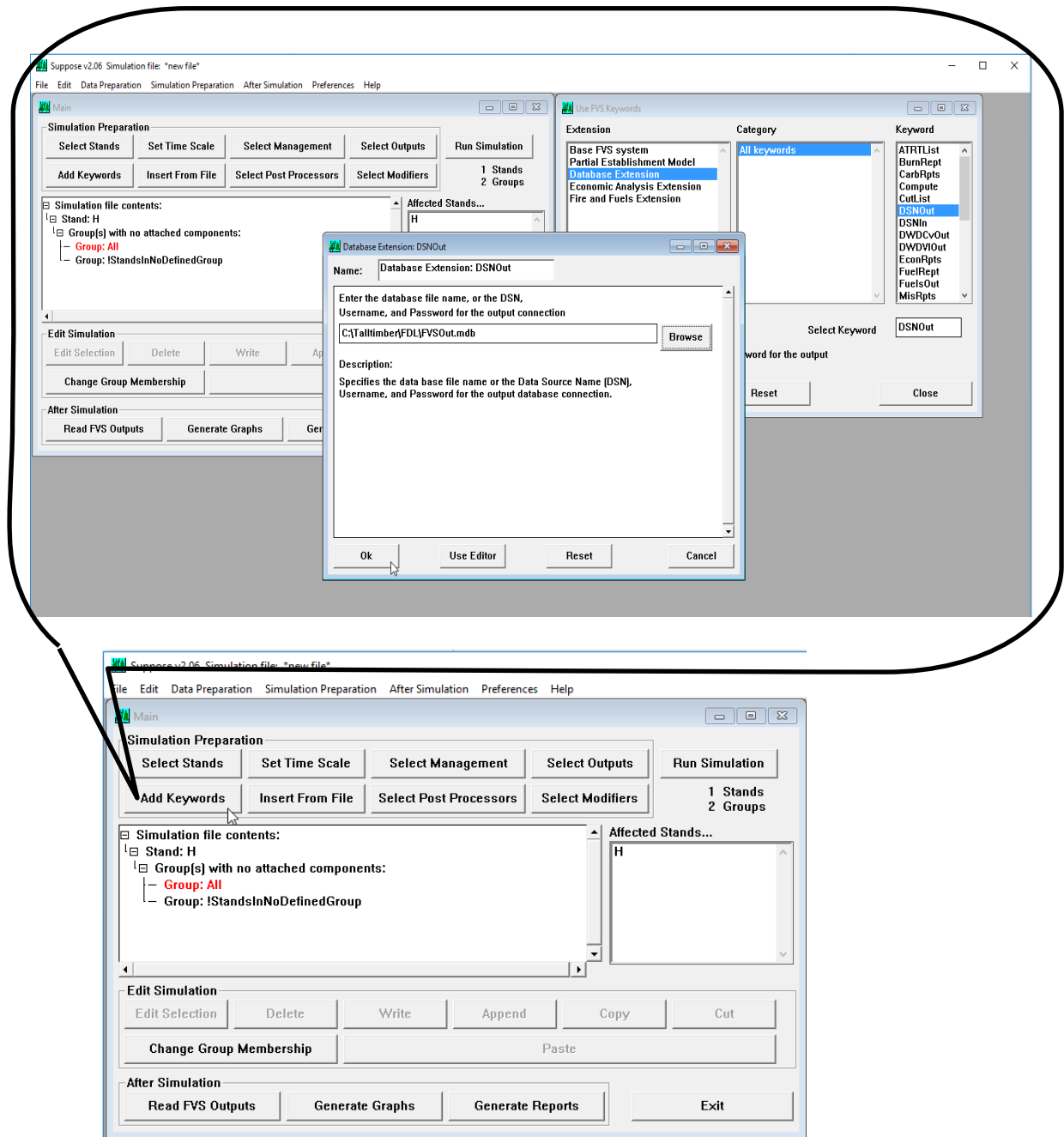


Figure 24. Clicking the *Add Keywords* button opens the *Use FVS Keywords* form. Two keywords need to be added in the TallTimber 2 FVS process, DSNOut and Summary. Both of these keywords are found in the Database Extension pane, highlighted above in blue.



customize TallTimber to look for an Excel spreadsheet DSN rather than FVSOOut.mdb, but that is not the standard formulation we are describing in this section.

Having successfully created the DSN, we move back to the Suppose interface and continue the growth modeling started earlier. We selected “H” as the first stand or strata we are going to model as shown in Figure 21 and also in Figure 24 on the left side of the *Main* Suppose simulation window pane, where the words "Stand: H" appear. Operators must then select the Database Extension (in blue) in Figure 24 to add Keywords.

To get the output we need, FVS requires us to enter several “keywords” in the assembly of the growth formulation we started earlier. These keywords are easily entered through the Suppose interface, by using the mouse navigation to the keyword form as shown on the right of Figure 24, and double clicking DSNOut. After double clicking DSNOut in the keyword pane, a form titled *Database Extension DSNOut* opens. Operators need to enter the name with path location of the FVSOOut database, just as shown in Figure 24 (enter this: C:\TallTimber\FDL\FVSOOut.mdb). After closing that form, next scroll down the keywords pane and double click the keyword Summary, which instructs FVS to create a summary table of its growth output, sending it to FVSOOut.mdb. The addition of the Summary keyword is shown in Figure 25, with Figure 26 showing how both DSNOut and Summary have been successfully added as keywords.

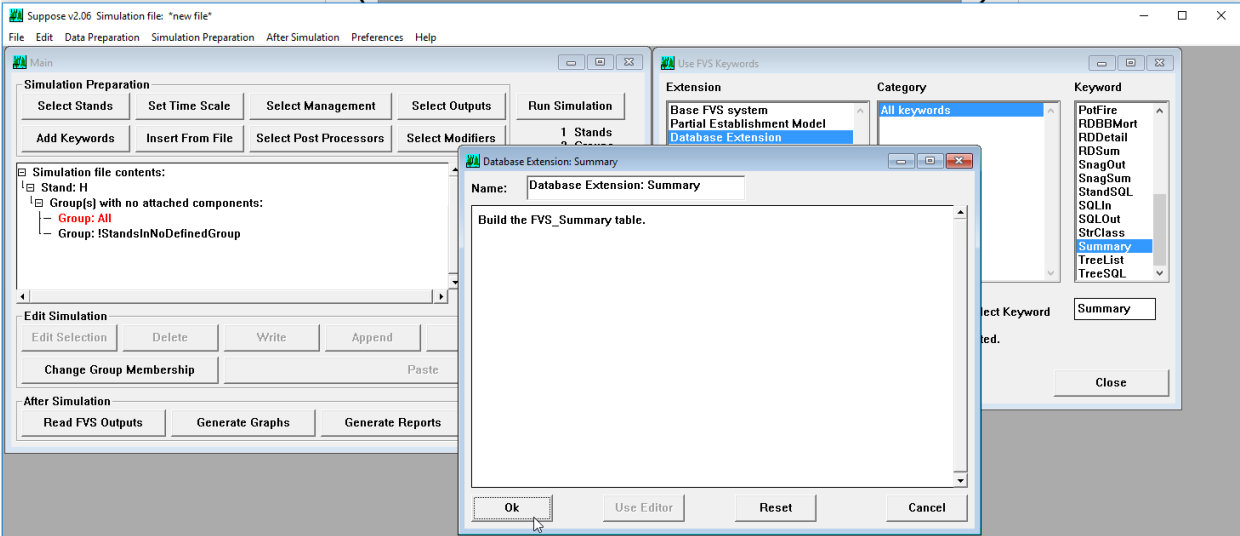


Figure 25. Operators add the Summary keyword by double-clicking it, highlighted in blue above. Then choosing ok adds it to the simulation pane.

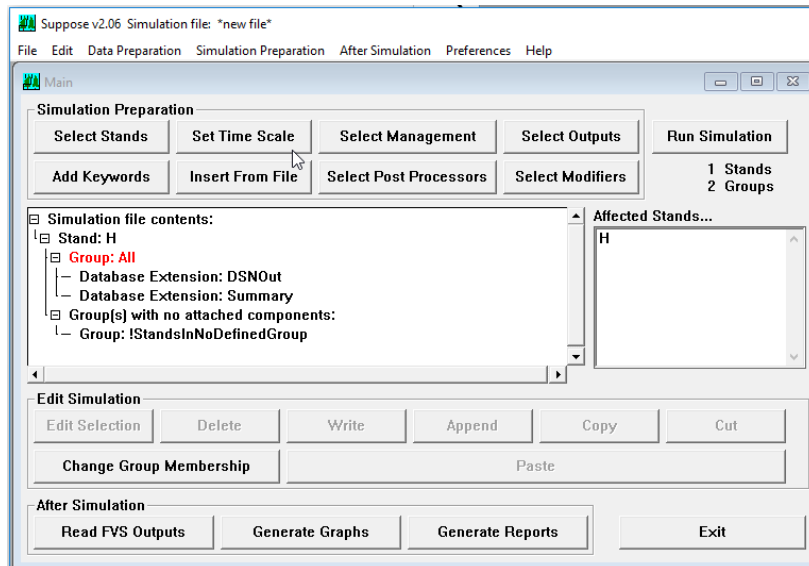


Figure 26. The Suppose interface shows stand/strata H will be simulated with DSNOut and Summary keywords through the database extension. This can be seen under the red font (Group: All) statement.



The last setting is to adjust the time scale by clicking the Set Time Scale button as shown in Figure 26 and then Figure 27. Figure 27 shows the *Set Time Scale* form with parameters set for a 30-year projection starting in 2017 with a five-year reporting interval. The 2017 matches what we had chosen earlier when we filled in the simulation start year on the TallTimber 2 FVS form. We draw your attention to these numbers as FVS Suppose defaults to ten-year periods and 100-year projections, which may or may not be acceptable. Some operators will want tighter reporting intervals and a shorter projection length. This needs to be reset after each run, if changed from the FVS default. You are ready to click the Run Simulation button.

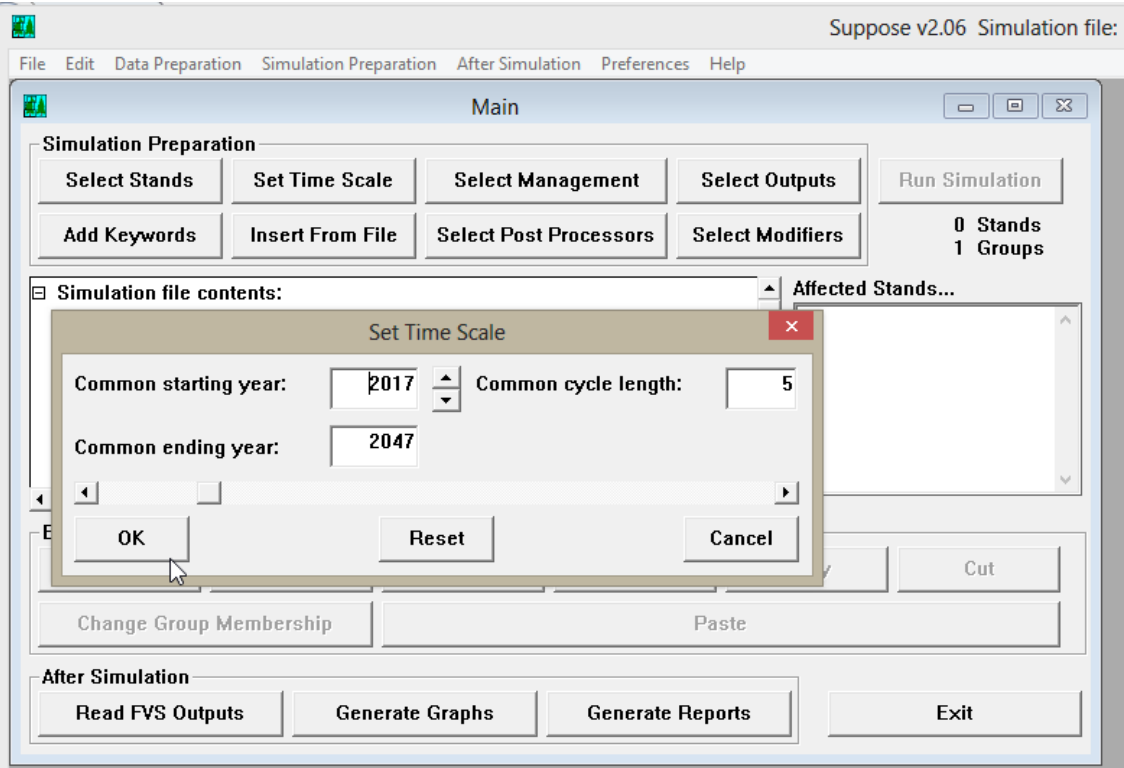


Figure 27. Setting the time scale involves setting the period length (cycle length) and the ending year. The starting year should already match the choice made earlier when entering growth parameters in TallTimber.



Step 5 is the more complicated part of TallTimber, and takes a few practice runs for most people to smoothly accomplish. At this point we have taken the below steps, finalized by the clicking of the Run Simulation button, which should launch a DOS window where FVS will briefly run. We list the steps to help focus you on what we've done after clicking the Step 5 button to get to this point.

1. Input stand parameters such as site index, site index species, year to start simulation, and regional variant.
2. Checked our stand parameters to make sure we have made the correct choices.
3. Create location file (Suppose.loc), stand files (*.slf), and tree files (*.fvs).
4. Launch FVS Suppose.
5. Choose File menu and open the locations file (Suppose.loc) from the folder where it was created in 3.
6. Add the stand by clicking the stand name in the *Select Simulation Stands* form and Add 1 Stand button.
7. Establish DSN with ODBC Manager through Control Panel (**this done just once, first use only, not required for each use of TallTimber**).
8. Add keyword DSNOut, and designate the database as C:\TallTimber\FDL\FVSOOut.mdb.
9. Add keyword Summary. Both keywords should be visible in the pane under *Simulation File Contents*.
10. Set the timing of the simulation by opening *Set Time Scale* form and modifying it appropriately.
11. Click the Run Simulation button on the upper right hand corner of the *Main* suppose form.

At this point, we leave FVS Suppose open, and switch back to the TallTimber interface. If we have a successful DSN connection, we should be able to view the growth projection by clicking on the *View Type Report* button, which is shown in Figure 28. This growth report is for individual stands or strata, with the H strata shown in the diagram. The Summary growth report creates a stratified growth report for all stands grown.

An important reminder for growth modeling is that TallTimber erases growth output each time the *Launch FVS Suppose* button is executed. The implication of this fact is that you should keep FVS Suppose open while modeling a given dataset. If you inadvertently close FVS Suppose before finished modeling and don't want to lose the projections made thus far, just re-launch FVS Suppose from the desktop or the File Explorer rather than from within TallTimber. TallTimber is set up this way to reduce the possibility of contaminating or combining old and new inventory projections leading to invalid results. This is important to remember and is a safeguard for clean FVS output.

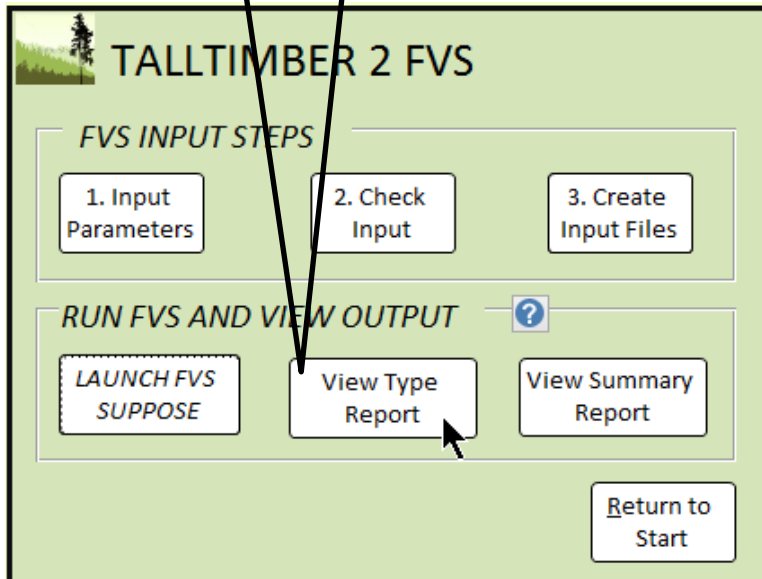
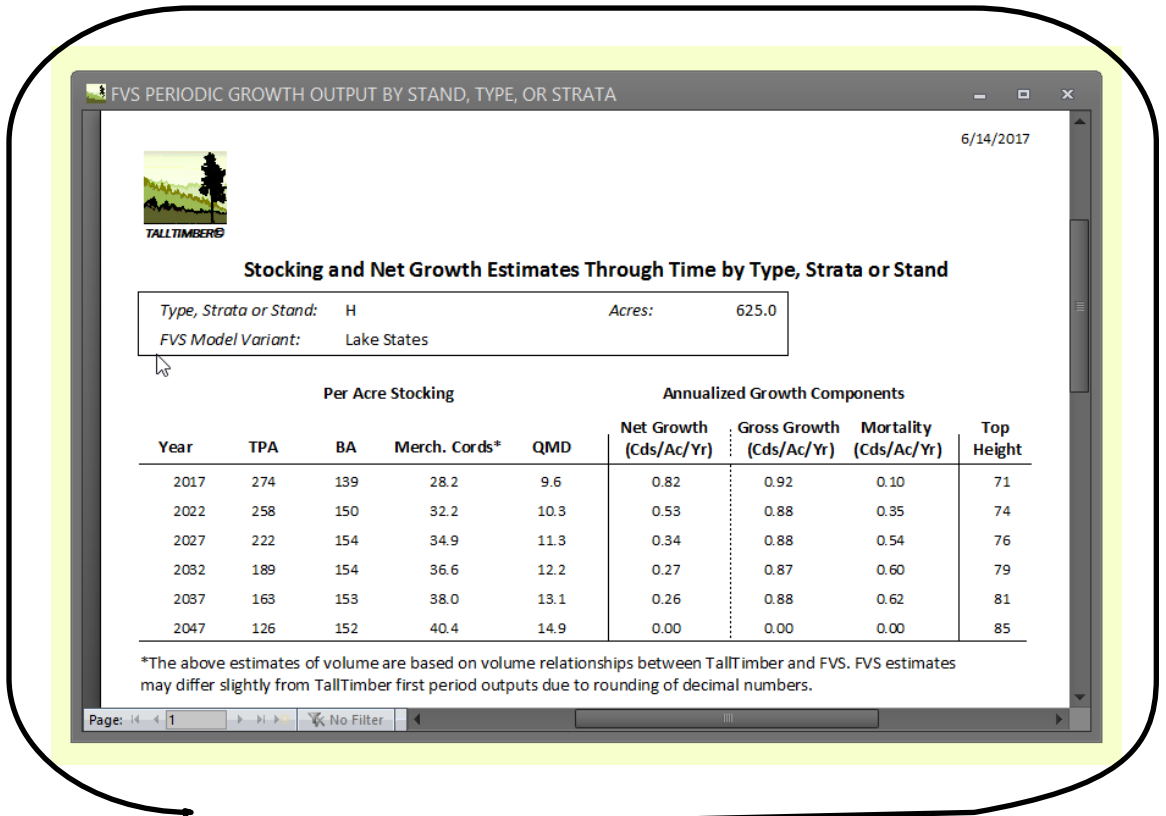


Figure 28. Clicking the View Type Report button builds the stand or strata growth report. The View Summary Report button builds the stratified report, combining grown stands or strata to an average weighted by acres.



Operators have several options regarding retrieving the growth projections from TallTimber. The first would be to simply click the Print button when the report is shown like the one in Figure 28, resulting in either or both of the reports being printed (stand level and stratified property level). Operators can also return to Step 4 of the home menu and navigate to the combined report builder as shown in Figure 16 (page 23). The *Report Builder* form, shown below in Figure 29 (below), has the FVS reports included as options on the Stand and Stock tab. Lastly, operators can simply enter a value in these boxes after growing the inventory and include these individual reports into the final compiled version.

We think that adding a final section of growth projections to a static inventory thoughtfully reminds clients that forests change, and also become an opportunity to consider if, where, and when management may be appropriate at the stand or strata level. Figure 29 has the FVS

Stand and Stock Charts MBF, Cords, Tons

TALLTIMBER® Report Builder

Return to Prior Make - Print

International 1/4" Rule

Stand and Stocking Reports at Strata, Type or Stand Level
Stand, Merchantable Cord, Height Stocking at Type or Stand Level: Print Order:
Stand, Merchantable Ton, Height Stocking at Type or Stand Level: Print Order:
Stand, Board Foot, Height Stocking at Type or Stand level: Print Order:
Stand and BA Stocking at Type or Stand Level Report: Print Order:

Stand and Stocking Reports at Combined Forest or Property Level
Stand, Merchantable Cord, Height Stocking at Property Level: Print Order:
Stand, Merchantable Ton, Height Stocking at Property Level: Print Order:
Stand, Board Foot, Height Stocking at Property Level: Print Order:
Stand and BA Stocking at Property Level: Print Order:

FVS Results
Net Growth and Stocking Estimates at Type or Stand Level: Print Order:
Net Growth and Stocking Estimates at Property Level: Print Order:

Stocking with AGS/UGS Classes at Strata, Type, or Stand Level
Board Foot and Cord Volume Stocking at Type or Stand Level: Print Order:
Board Foot and Tons Stocking at Type or Stand Level: Print Order:

ENTER THE SORT ORDER (1, 2, ...15)

Figure 29. The Report Builder form is shown with five individual sub-reports included on the Stand and Stock tab. FVS reports are selected as 4 and 5. You can select up to fifteen sub-reports to be combined in their master report, typically a shared paper or digital product.



reports listed as the fourth and fifth in a series of individual reports. We remind you when looking at Figure 29 that there may be other reports included from entries on the Charts or MBF, Cords, Tons tabs which are not visible in Figure 29.

In summary, you will need to understand that the TallTimber 2 FVS component has a few more moving parts than the four menu steps required for processing an inventory and printing out reports. TallTimber requires the first four steps be completed before the growth area can be successfully performed. During the FVS modeling and after, TallTimber reporting requires two successful links. One between FVS and FVSOut.mdb, and the other between TallTimber.mdb and FVSOut.mdb. This means that a DSN must be created to allow FVS to write the necessary tables, and it lastly means that FVSOut.mdb must be located in the correct folder where TallTimber is looking for it (C:\TallTimber\FDL\). Most importantly, call or email us if you are struggling in the TallTimber 2 FVS module, we'll help!



Appendix A: A Digression on FVS

For new FVS operators, FVS is a national tree growth projection and ecosystem modeling platform, which has over 20 geographic variants suited for particular forest regions around the United States. The four geographic variants directly coded into the FVS Variants combo box (the dropdown list shown in Figure 18) cover the United States east of the Great Plains. Each of the FVS model variants has its own published 80-100 page overview guide that can be found on the FVS part of the Forest Service's website. They are listed below, along with the states covered by each variant. A broader publication intended for all operators is *Essential FVS: A User's Guide to the Forest Vegetation Simulator* (Dixon, 2017). It can be downloaded at: <https://www.fs.fed.us/fmfc/ftp/fvs/docs/gtr/EssentialFVS.pdf>.

CN = Central States; IA, IL, IN, KS, MO, NE, SD

(https://www.fs.fed.us/fmfc/ftp/fvs/docs/overviews/FVScs_Overview.pdf)

LS = Lake States; MI, MN, WI (parts of eastern ND and northeast SD)

(https://www.fs.fed.us/fmfc/ftp/fvs/docs/overviews/FVSlS_Overview.pdf)

NE = Northeast; CT, DE, MA, MD, ME, NH, NJ, NY, OH, PA, RI, VT, WV

(https://www.fs.fed.us/fmfc/ftp/fvs/docs/overviews/FVSnE_Overview.pdf)

SN = Southern; AL, AR, FL, GA, KY, LA, OK, MS, NC, SC, TN, TX, VA

(https://www.fs.fed.us/fmfc/ftp/fvs/docs/overviews/FVSnS_Overview.pdf)

The FVS modeling platform is extensive, including numerous optional extensions and menus of choices facilitating modeling of fire, insect outbreaks, and other ecosystem events best tested via computer simulation. However, our goals with TallTimber are more basic. We strive to make FVS accessible to foresters and landowners that are focused on simply growing the inventory they have just processed. These people may not have done much growth modeling, or don't have time to dedicate the many hours required to become an FVS expert. TallTimber does not make using FVS easy, but it does make it much easier. As stated earlier, a major plus to using the TallTimber 2 FVS process is that it overcomes the FVS problem of poor volume estimate calibration to local standards. TallTimber will use the merchantability specifications you established in the inventory processing rather than those internal to FVS.

A smaller group of TallTimber operators may be interested in deeper growth and yield studies, climate where more of FVS's keywords are employed and silviculture is modeled. In this case, we need to state that TallTimber's current input structure allows the basic FVS choices to be made. It is not setup to simplify all of the input options such as adding increment core data to your tree input files (*.fvs files). It does include the tree history and tree value class codes associated with the input data, based on the AGS/UGS or the product section data originally



input. It also is sure to bring the 0-tally points along to the growth modeling input, as would be anticipated.

In cases where more detailed projections are sought, TallTimber remains a very compelling starting point for creating FVS input files from which independent growth analyses can be pursued. In other words, create the input files with TallTimber followed by output processing outside of TallTimber. We again suggest operators obtain the manual mentioned earlier authored by Gary E. Dixon, *Essential FVS: A User's Guide to the Forest Vegetation Simulator* (<https://www.fs.fed.us/fmfc/ftp/fvs/docs/gtr/EssentialFVS.pdf>).



Appendix B: TallTimber 3.5, Microsoft Access (MS-Access) and Its Free Runtime Version

You don't have to know how to use MS-Access to use TallTimber. The User Interface (UI) built into TallTimber lets you focus on your data, your specifications, and your output. Behind the TallTimber UI, is a Microsoft Access database in a compiled format (mde or accde file depending on what version of Access you are using). Most operators will just work with the UI and will not need to open the tables or queries behind the TallTimber program. However, we've kept many of these objects available for investigation for the more curious and experienced. We distribute TallTimber in a fashion where it must be a purposeful effort to explore the database side of TallTimber, as we don't expect most will want to view or be bothered by the nuts and bolts of the application. Tables and queries are fully accessible, so be warned that you can edit or delete them inadvertently if exploring in this area.

One helpful aspect of delivering TallTimber as an MS-Access file is that Microsoft offers a free, run-time version of MS-Access for download from their website. People who are interested in TallTimber, but don't currently have MS Access and don't want to buy the full version, can download MS Access Runtime and use it as long as they want. MS Access Runtime is a limited version of MS Access with no time limit on usage. We've taken a similar approach to TallTimber, and have a demo version available for download for free.

You will need to work with the bit version of TallTimber that matches your MS Office. The main point to remember is that MS Office currently comes in two structures (32 and 64-bit), and we provide TallTimber in both of these. Remember that MS Office means the programs (Word, Excel, Access, Powerpoint, Outlook, etc.) while Windows is the operating system. A 64-bit Windows operating system often will have 32-bit MS Office installed, so don't guess your MS Office architecture from your operating system. You only need to care about the MS Office, whether it is 32-bit or 64-bit. You need to determine your setup so you can run the correct instance of TallTimber. Figure 30 shows an example of the identification form found under the File-Help command in a 32-bit, MS Access 2010 installation on a Windows 8 operating system. This might be found under the About command in other MS Office configurations, but the best way to figure out your version is to go to the Microsoft website and check: <https://support.office.com/en-us/article/What-version-of-Office-am-I-using-932788b8-a3ce-44bf-bb09-e334518b8b19>. This link is also posted on our homepage.



Product Activated

Microsoft Access 2010

This product contains Microsoft Access.

About Microsoft Access

Version: 14.0.7128.5000 (32-bit)

[Additional Version and Copyright Information](#)

© 2010 Microsoft Corporation. All rights reserved.

[Microsoft Customer Services and Support](#)

Product ID: 01616-184-1512865-69638

[Microsoft Software License Terms](#)



Figure 30. This image is from an MS Access 2010 version with 32-bit design. To view this image, we selected the following menu options from within Access: FILE-->HELP. This information is also visible in MS Word, Excel, and other MS Office applications. The discovery process varies, but may also be found under ABOUT.

Download Sites for Free Versions of MS Access and TallTimber:

MS Access Runtime: <https://www.microsoft.com/en-us/download/details.aspx?id=10910>

TallTimber_Demo: <http://www.ttimmer.com>

A few more comments are in order regarding the TallTimber Demo license and TallTimber in general. According to their website at the time of this writing, the default installation for MS Office 2016 and Office 365 is the 32-bit architecture. This is the default we use with the TallTimber naming convention, meaning that whenever there is a 64-bit program, we will add the "x64" to the name. So, if you don't see the "x64" in the name, assume it is the 32-bit TallTimber. Remember, TallTimber is a compiled program and the version you run must match your version of MS Access (32-bit or 64-bit). The names of the Demo and full versions of TallTimber are shown below for instances with 32-bit structure and also with 64-bit structure (x64). As stated elsewhere, we distribute TallTimber as both mde and accde files.



Demo Versions (32-bit) , file names: TallTimber_Demo.mde, TallTimber_Demo.accde

Demo Versions (64-bit), file names: TallTimber_Demox64.mde, TallTimber_Demox64.accde

Full Version (32-bit), file names: TallTimber_FDL.mde, TallTimber_FDL.accde

Full Version (64-bit), file names: TallTimber_FDLx64.mde, TallTimberx64.accde

You cannot run both 32 and 64-bit Office versions on the same operating system simultaneously (as in 32-bit MS Word and 64-bit MS Access), that choice is made during the initial installation for all MS Office products. We distribute TallTimber in both formats to all customers, and if you choose the wrong version you will simply get a pop-up window giving you feedback on the problem. Try the other version of TallTimber and you should have success. To restate, we provide all the combinations when you purchase and provide links to both 32-bit and 64-bit when you download the Demo version.

TallTimber will come either as a download (Demo version), or on a flash drive mailed to you and ready to be set up on your computer. It may be in a zip archive (a compressed folder) having 8-12 files in it, or just individual files on a flash drive. These 8-12 files need to be copied to your system. **If doing any growth modeling with the TallTimber 2 FVS module (Step 5), you should put the FVSOOut.mdb file in a folder structure "C:\\TallTimber\\FDL" or Step 5 won't work. The location of the other files doesn't matter as long as they are in the same folder.** If a purchased license, all four TallTimber formats as shown at the top of this page will be included. The extra files are to both help you get the most out of TallTimber, and help TallTimber function as designed. The likely extra files are described below.

File Name	Description	Importance
Read_Me.txt	Help file for setting up TallTimber	Helpful, not required
ExampleData.xls	Spreadsheet with 6 points of data	Helpful, not required
DeerLake.xls	Spreadsheet with 170 points of data	Helpful, not required
TallTimber.ico	Image file that program uses for icons	Cosmetic, not required
TallTimber.dll	Library file required for pay licenses	Critical
TallTimberx64.dll	Library file required for pay licenses	Critical
FVSOOut.mdb	FVS output destination database	Critical for growth reports

Table 31. TallTimber comes as a compiled MS Access file, in mde and accde versions. It also is provided in both 32 and 64-bit formats. The mde version works on all Access versions, while the accde file works on newer systems only. There are seven additional files, shown above, which vary in importance. Several are critical while others are helpful but not required for TallTimber function. **It is critical that the library files (dll's) are located with TallTimber in whatever folder you copy it into. The Demo version does not require the library files.**



Appendix C: Instructional Video Help with TallTimber

YouTube Channel TTimber, organized in a Playlist at this link:

<https://www.youtube.com/playlist?list=PLaZotM2nHrOQMpmN7A5gxPQ3hxTnXD5QJ>

Video Number

0. Installing the Demo and Pro License Versions
1. Input Data Formats
2. Creating a Named Range
3. Step 1-2: Importing Data and Changing Species Codes
4. Step 2: Changing Weight of Wood, Sort Order in Reports
5. Step 2: Merchantability and Regeneration Settings
6. Step 2: Cubic Feet per Cord, Scaling, Volume Equations
7. Step 3: Profile Report
8. Step 4: Individual Report Mode, Grid Data
9. Step 4: Combined Report Mode
10. Step 5: FVS Set-Up
11. Step 5: FVS Execution
12. Step 5: FVS Report Interpretation and Inclusion



Appendix D: Quick Start Guide

For those intrepid people who like to jump in and figure things out with less assistance, we offer the shorthand version of moving ahead with TallTimber. If you already have MS Access on your computer, are not flustered by uncertainty, and understand you can always fall back to other resources give the following a try.

1. Create the folder path on your C drive of C:\TallTimber\FDL. Put all files in your TallTimber package in the FDL folder. There will be 8-12 files, depending on version. Check out the Read_Me.txt file. **TallTimber will work in other folders, but this folder structure is required if using the TallTimber 2 FVS growth module, so this is the easiest path forward.**
2. Change the "Default Database Folder" setting in MS Access to "C:\TallTimber\FDL". This property is found by clicking FILE>OPTIONS>GENERAL and then looking on the Options pop-up window for "Default Database Folder". Do this with a blank database, or just by starting MS Access without a database opened, **not from within TallTimber.**
3. While in the same area as #2 above, figure out if you have 32-bit or 64-bit MS Office and use that version of TallTimber (your package has both 32-bit and 64-bit TallTimber). This "bit" info will be somewhere like FILE>HELP (MS Access 2010) or FILE>ACCOUNT>INFO (MS Access 2013). TallTimber_FDLx64.mde and TallTimber_FDLx64.accde are the 64-bit versions.
4. Open TallTimber by double clicking on the bit-version and format matching your system. Remember that the mde formatted TallTimber will work on all systems, the accde formatted TallTimber will work on newer MS Access systems.
5. Step 1: Import Data. Choose one of the example data files that came with TallTimber (Example_Data.xls, Deer_Lake.txt, etc.) You should get either a "Successful Import" message or a message declaring a problem with the import dataset. Data can be text or Excel.
6. Step 2: Enter Input Parameters. Enter your prism BAF or fixed-radius plot size. All other parameters are optional, and are numbered 2 through 6 on the TallTimber Inputs form. Experiment with these later on, you can save your changes with "Keep My Codes".
7. Step 3: Check Input Success. Verify that your input matches your understanding of the data. Is this the correct number of points, is BAF or plot size correct, is the acreage correct?
8. Step 4: Process, Get Results. View/print output in any of three log rules, and either as single reports or multiple compiled reports (58 prepared reports are offered) with a professionally customized cover page. Copy/paste or export grid tables to Excel for further



analysis and reporting. This “Process, Get Results” step is a prerequisite to the TallTimber 2 FVS growth module.

9. Step 5: Growth. Brings you to TallTimber 2 FVS, a growth module allowing you to choose an FVS variant and other stand level parameters, create input files, and grow your inventory. TallTimber then links to the FVS output and provides detailed growth reports from the multiple report interface as in Step 4 (above Item 8). You likely will need to go back in this manual and read about Step 5 or watch our videos for those without FVS experience. See our YouTube channel (TTimber) for direct video instruction and a more granular breakdown. You can do this, the videos can help!

When importing raw data from an Excel file, be aware that TallTimber requires the data be in a *named range* (an Excel term) called "Data". Alternatively, the input file can be in a comma-delimited text file as is exported by Timberpad Pro 2.0. For an example of the Excel dataset style, see the example data included with your TallTimber package. Remember to include the top row (has heading names) in that named range. See the Timberpad supplemental manual for more information about text file input datasets.



Appendix E: Species Codes and Default Values

TallTimber	Species Name	FIA	Girard FC	FVS Spp Code	Lbs/Cu. Ft.
1	White pine	129	0.8	WP	50.59
2	Hemlock	261	0.78	EH	56.47
3	Red spruce	97	0.8	RS	49.41
4	Balsam fir	12	0.8	BF	49.41
5	Red pine	125	0.8	RN	50.59
6	White cedar	241	0.76	WC	40
7	Sugar maple	318	0.79	SM	63.53
8	Red maple	316	0.79	RM	52.94
9	Paper birch	375	0.78	PB	52.94
10	Yellow birch	371	0.78	YB	63.53
11	Beech	531	0.84	AB	52.94
12	Red oak	833	0.78	RO	63.53
13	White oak	802	0.78	WO	63.53
14	White ash	541	0.8	WA	52.94
15	Aspen	746	0.78	QA	50.59
16	Black cherry	762	0.8	BC	52.94
17	Basswood	951	0.8	BW	50.59
18	Tamarack	71	0.8	TA	56.47
19	Other hardwd	2	0.78	OH	63.53
20	Other softwd	999	0.78	OS	49.41
21	Black birch	373	0.78	BB	63.53
22	Black gum	693	0.78	BG	52.94
23	Black locust	901	0.78	BL	65.88
24	Black oak	837	0.78	BO	63.53
25	Black walnut	602	0.78	WN	52.94
26	Chestnut oak	832	0.78	CO	63.53
27	Cucumbertree	651	0.78	CU	52.94
28	Hickory(s)	400	0.78	HI	65.88
29	Norway Spruce	91	0.8	NS	49.41
30	Pine(s)	100	0.8	PI	50.59
31	Sassafras	931	0.78	SS	52.94
32	Scarlet oak	806	0.78	SO	63.53
33	Sycamore	731	0.78	SY	52.94
34	Yellow poplar	621	0.78	LP	56.47
35	Snags	-	0.78	-	54.12
36	Black ash	543	0.78	BA	52.94
37	Black spruce	95	0.8	BS	49.41
38	White spruce	94	0.8	WS	49.41
39	Butternut	601	0.78	BN	50.59
40	Elm	972	0.78	AE	52.94
41	Balsam poplar	741	0.78	BP	50.59



TallTimber	Species Name	FIA	Girard FC	FVS Spp Code	Lbs/Cu. Ft.
42	Hophornbeam	701	0.78	HH	65.88
43	Shagbark hickory	407	0.78	SH	65.88
44	Pignut hickory	403	0.78	PH	65.88
45	Shell. hickory	405	0.78	SL	65.88
46	Mocker. hickory	409	0.78	MH	65.88
47	Sweetgum	611	0.78	SU	52.94
48	Silver maple	317	0.79	SV	52.94
49	Cherrybark oak	813	0.78	CB	65.88
50	Live oak	838	0.78	LO	50.59
51	Bur oak	823	0.78	BR	75.80
52	Overcup oak	822	0.78	OV	63.53
53	Water oak	827	0.78	WK	63.53
54	So. red oak	812	0.78	SK	63.53
55	Cottonwood	742	0.78	EC	50.59
56	Baldcypress	221	0.78	BY	56.47
57	Loblolly	131	0.78	LP	58.00
58	Slash pine	111	0.78	SL	60.00
59	Longleaf pine	121	0.78	LO	60.00
60	Shortleaf pine	110	0.78	SH	58.00
61	Jack pine	105	0.78	JP	56.47
62	E. Redcedar	68	0.78	RC	45.00



Supplement on Timberpad 2.0

Data Collection Software

Verizon 10:12 AM 91%

Timberpad Pro 2.0

Setup Tally Tools

Project Name MyWoodlot

Cruiser JDP Stand/Strata H3A Acres 175.0

Plot + GPS EXIT Current Plot-Tree 1-1

Stocking Level Well Stocked

Plot Comment Adjacent to landing

☒ Warnings On

☒ Multi-Product ☐ Saw-Pulp

X-Cd 44.30656 Y-Cd -69.97022 +/- 10

Timberpad Pro 2.0 ©, L.E. Caldwell, LLC, 2018

iOS

10:26 AM 97%

Timberpad Pro - 2.0

Setup Tally Tools

Project MyWoodlot

Cruiser JDP Stand/Strata H3A Acres 175

Plot+ GPS Current Plot - Tree 1 - 1

Stocking Level Well Stocked

Plot Comment 1/2 chain W line

☐ Warnings Off

☒ Multi-Product ☐ Saw-Pulp Height

X-Crd. 0.000000 Y-Crd. 0.000000

Android

L.E. Caldwell Company
www.ttimmer.com
support@ttimmer.com



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Guide to Timberpad 2.0 Data Collection Software

About this Document

This document is intended to get you going with Timberpad 2.0. Different people learn differently. Some are very tactile or "hands on" while others learn faster by reading and thinking. This document does not address every nuance of using Timberpad, it is more of a pictorial to get you going with pictures and some details. You will need to interact with it on your device ultimately, but reading and thinking about it first is a great approach. Readers interested in runtime licenses and platform (iOS & Android) information can go to page 71.

Explaining Timberpad is made slightly more complicated as it is cross platform and can be used on a variety of devices. The 2.0 version being released with this manual (April, 2018) has been developed for iOS (Apple mobile) and Android. However, we also developed a version for the older Windows Mobile 5 system as we have used it extensively ourselves on those older devices and wanted to accommodate 1)foresters trying to stretch out their hardware investment dollar, and 2)those cruising in the harshest conditions where small screens and physical buttons are required. The versions operate similarly, with the iOS and Android versions being smoother-faster outside those severe conditions of deepest cold or heavy rains.

With that said, this manual mixes images of the iOS (lighter images) and Android (darker images) platforms, and speaks only indirectly to the vintage Windows Mobile version. The iOS and Android versions function almost identically, and screenshots from both devices are included so more readers can view here what to expect on their device. Vintage Windows Mobile devices have a smaller screen, use physical buttons and a stylus, and have some functional differences. We have tied some of the basic operations to the physical buttons (rocker button and 4 common buttons) on those older devices. Your device may provide a slightly different look than what is shown here. If and when questions arise, don't hesitate to contact us. Here are some forms of Timberpad Technical Support:

1. Operator's manual (this document)
2. Instructional videos playlist on YouTube channel (TTimber channel)
3. Website: www.ttimmer.com has an overview video of Timberpad iOS.
4. Email us: support@ttimmer.com
5. Call us: 207.377.3956 or schedule a visit or a workshop for you or your group



What is Timberpad 2.0?

Timberpad (or TPad for short) is data collection software designed for forest inventory, commonly called timber cruising. We have used earlier versions for over 10 years. Figure 1 depicts TPad's role at the start of the inventory process. We have tested TPad on a variety of devices running the Android operating system from Honeycomb to Nougat, iOS devices from iPhone 5 and original iPad forward, and vintage Windows Mobile devices such as the Dell Axim and the Trimble Juno and Ranger running the Windows Mobile 5 operating system. Timberpad 2.0 has not been styled for the largest iPad, the much larger iPad Pro.

TPad Android functions as a small collection of files on your device while TPad iOS functions as a single FileMaker Go file . TPad provides several tools to export data from its database table into files that can be imported into spreadsheets and databases. This export is most easily done via email, but can be a cabled copy/paste of the file (iCloud AirDrop, too). Other helpful tools such as a limiting distance calculator and product specification importer/exporter are also part of TPad, and are shown later in this manual, along with version and runtime license information described near the end of the document. Flip to the final page of this document (p 73) for Quick-Start information if you're in a hurry.

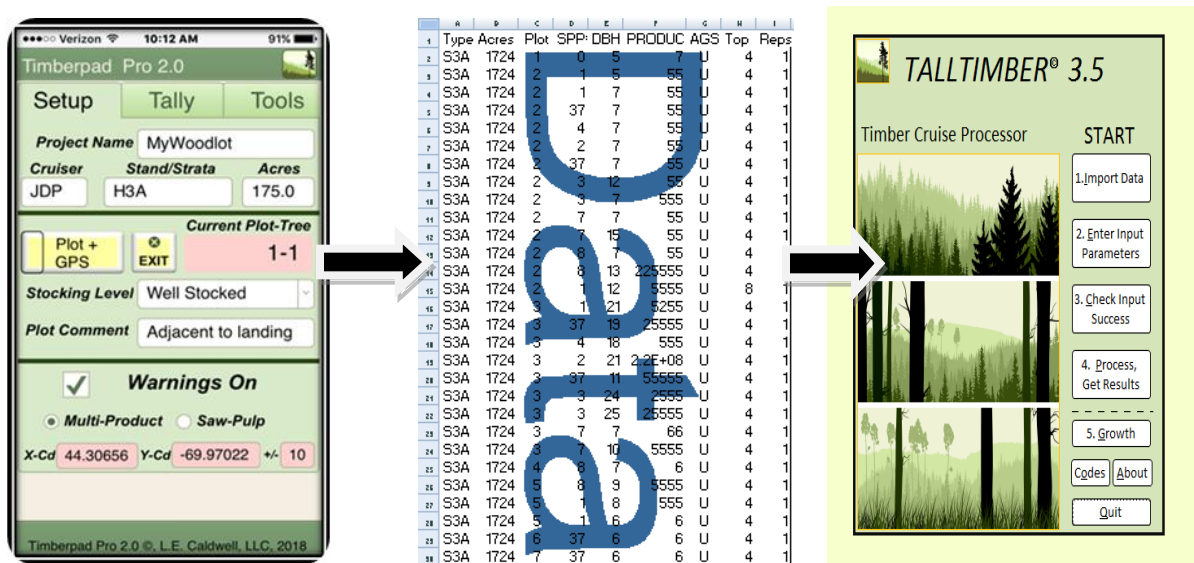


Figure 1. Timber cruise data is logged into the tablet/phone/device with Timberpad, which then exports the raw data to comma delimited files that can be emailed or otherwise transferred to spreadsheets and database programs such as TallTimber for processing.



TPad itself does not create the suite of final outputs possible with TallTimber, such as robust reports, spreadsheet tables or charts. It does provide a running tally of basal area per acre, trees per acre, number of total points, number of 0-tally points, and number of tally trees.

Figure 2 shows the forms (Android) you interact with when using TPad. The main form itself is a tabbed form with 3 tabs allowing you to shift between 3 neighboring forms; Setup, Tally, and Tools (Tools shown below and on cover of this document). You spend most of your time using the 3 tabs on the main form, with occasional jumps from the buttons shown below on the Tools tab to other individual forms, the smaller images with the titles shown below.

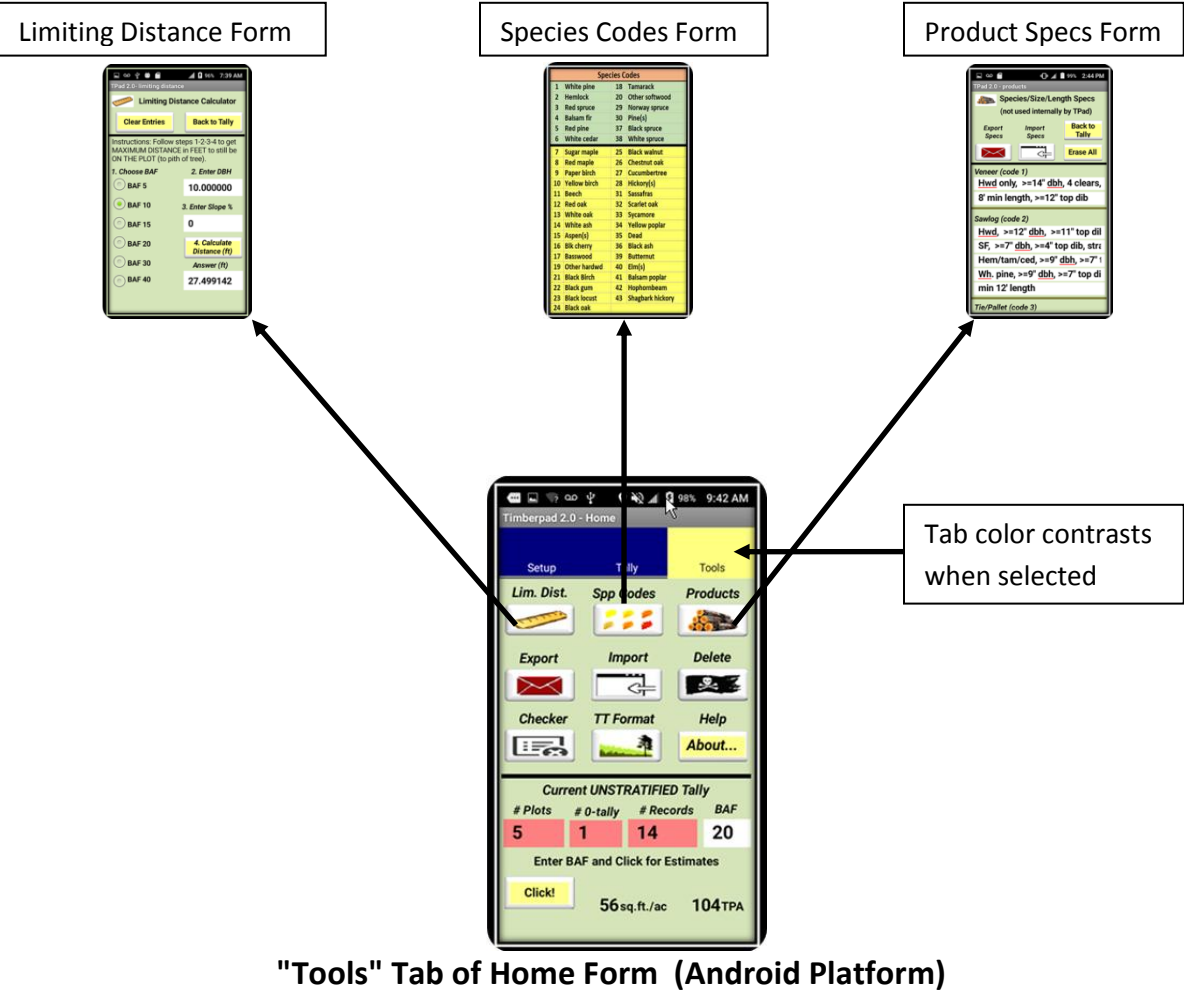


Figure 2. The Timberpad Home form (the bigger image above) has 3 tabs, with the Tools tab shown above. Nine buttons are located on the Tools tab which perform functions supporting the basic data entry of tallying trees (done on the Tally tab). The Setup tab, the most left tab, is where project and plot level data is entered. The above images from an Android device.



Stepping Through Timberpad's 3 Tabs ([Video 1](#))

Rules for File Naming of Your Data Table During Export and Import

iOS: Value of **Project Name** in the **first tree record** is appended to "TPad_" to make the file name: TPad_My Woodlot.txt (Cruiser is not used with iOS)

Android: Values of **Project Name** and **Cruiser** fields in the **first tree record** are combined to make the file name: MyWoodlot_JDP.txt



iOS

iOS has an EXIT button.
Android uses device's close button.



Android

"Setup" Tab of Timberpad Home Form

Figure 3. Project and plot summary data is entered on the Setup tab. Values entered in the Project Name, Cruiser, Stand/Strata and Acres fields **for the first record** are automatically copied forward for each new record. Changing the Stand/Strata and Acres values when working on a different stand/strata has the new values copied forward. As shown above, Timberpad uses different naming conventions for exporting and importing files depending on whether iOS or Android, but is consistent on using the first record for this information.

New plots can be added via the autoplot system that increments plot numbers by 1 for each new plot, a manual system that allows cruisers to enter their own integers (page 70), or by importing a dataset. Plot location is collected when adding a plot via the Plot+GPS button.



Tally Tab ([Videos 2-3B](#))

The TD+ button (Tree Duplicator) allows you to add a tree record with the same species as previously entered, saving time on the species code entry for that tree. This is quite helpful where trees of the same species are "clumped" or just follow each other in the tally on a given plot. **The iOS format allows (shown with checkbox settings) duplication on diameter and product as well as just species. This is handled with via a popover button.**

The Top field is for entering the diameter inside bark (DIB) of the tree at the limit of merchantability. Top can be set to 0 if cruisers don't wish to call a Top DIB. We can set the default value of Top for whatever fits your process and region at purchase time. Top value standards vary by region and pulpwood markets.



iOS



Android

Figure 4. The Tally tab is where you collect data on individual trees, and actually spend most of your data entry time. Species codes can be entered as either alpha or numeric codes. The grid control (looks like a table) allows scrolling and jumping to individual records with touch screen devices. With Android, touch the bright red buttons for entering DBH and Multi-Product values. If cruising in Saw-Pulp height mode, enter the merchantable height in feet of sawlog material in the "Saw Ht" box and then the height of any pulpwood or topwood above that in the "Pulp Ht" box (Android shown).



Tools Tab ([Videos 4-6](#))

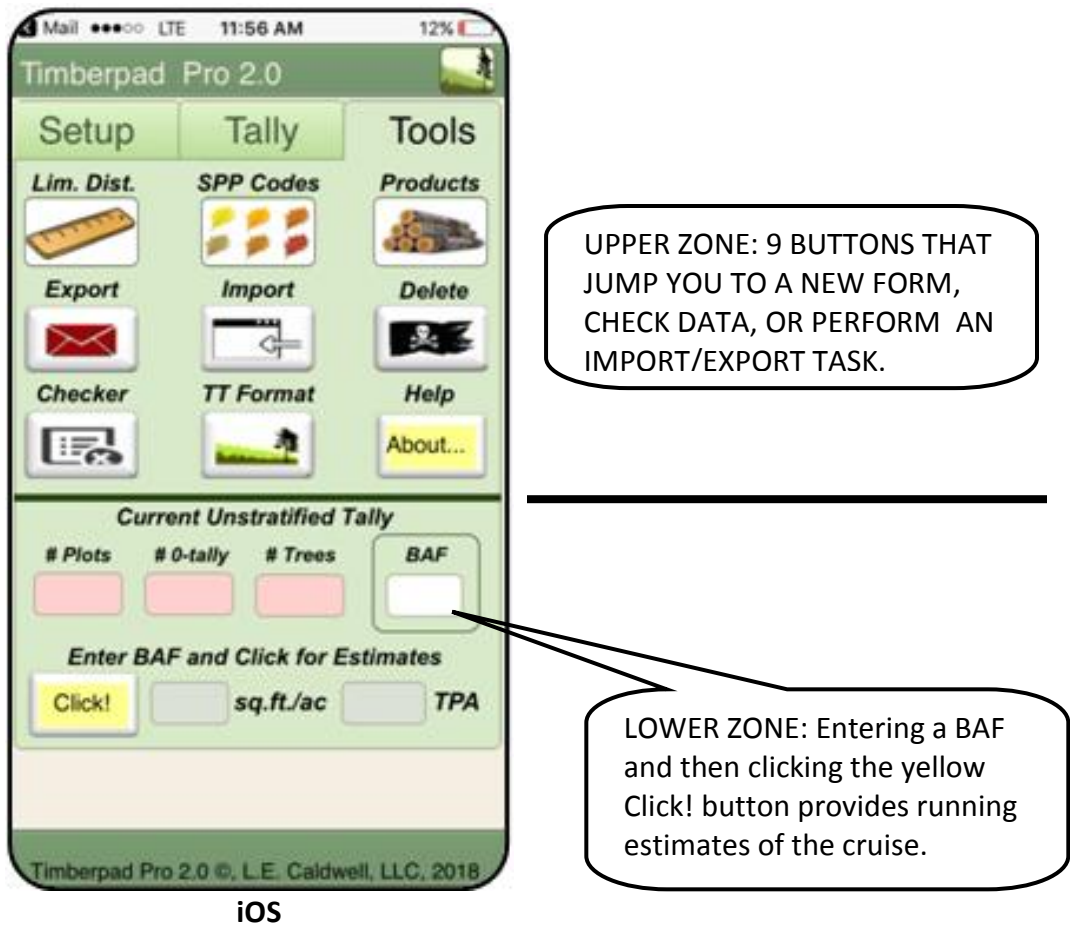


Figure 5. The Tools tab has 2 zones. The upper zone provides useful tools related to collecting, saving, and emailing data. An email client must be set up on the device for the auto-email to function (gmail works fine). The TT Format button produces TallTimber ready datasets.

The Tools tab is functionally divided into upper and lower zones. The upper zone has 9 buttons that are linked to useful tools as shown in Figure 5. We cover 8 of the 9 buttons on pages 62-69. The 9th button is labeled "About", and has license and contact information.

The lower zone provides basic information on the current dataset for variable radius sampling. Enter the cruise BAF and press the yellow Click! button to populate the 2nd zone with up to date information. Pop up messages occur alerting cruisers to any null or 0 DBH values that might impact the TPA estimate. The basal area and TPA estimates are rounded down and presented as integer values.



TPad 2.0 - Demo

Limiting Distance Calculator

Clear Entries Back to Tally

Instructions: Follow steps 1-2-3-4 to get MAXIMUM DISTANCE in FEET to still be ON THE PLOT (to pith of tree).

1. Choose BAF 2. Enter DBH

BAF 5 11.000000

BAF 10

BAF 15 25

BAF 20

BAF 30

BAF 40

4. Calculate Distance (ft)

Answer (ft) 25.458391

Limiting Distance Calculator

Timberpad 2.0 - Pro

Setup Tally Tools

<<< Plot-Tree 1 - 1 >>>

Plot+ Tree+ TD + DEL

Species DBH

BF 11.0 HLD

Product

222225

Note Top 4

Plot	Tree	SPP	DBH	Product	Reps
1	1	BF	11.0	222225	1
1	2	RS	9.0	2222226	1
1	3	WC	18.0	555557	1

H L D = 25.458 feet for a 11.0" DBH tree with BAF 15 and 25 PERCENT slope.

A U C L Reps 1

Limiting Distance Ghost Message

(Android Platform)

Figure 6. Horizontal limiting distances are addressed three ways in TPad. The limiting distance calculator itself, the optional ghost messaging (Android), and the HLD button on the Tally tab.

First is the Limiting Distance Calculator itself, shown above. This is an easy to use tool that you jump to from the Tools tab. It accommodates slope % values, alleviating the need for slope correction factor tables. The DBH value in the tool is automatically populated with the DBH of the last entered tree and in turn populates the BAF value shown in Figure 5 on the previous page. It provides 6 prism BAF choices.

The second method, shown to the right, is a time saving convenience we call ghost messaging, and is for Android devices only. After DBH is entered and any next screen tap occurs, TPad will display a 5-10 second temporary message stating the horizontal limiting distance (HLD) for the tree. The program relies on the BAF and Slope % settings last established in the Limiting Distance Calculator (show above as BAF 15 with 25% slope). This ghost messaging provides students, cruisers changing to a new prism BAF, and the less experienced consistent feedback and eye calibration on when to check for borderline trees. It can be turned off with the Warnings Checkbox. The third way limiting distances are produced is by simply tapping the HLD button adjacent to DBH (works for iOS and Android). This presents a message box stating the limiting distance for the current DBH, BAF, and slope.



Verizon 4:16 PM 69%

Timberpad Pro 2.0

Species Codes			
1	White pine	20	Other softwood
2	Hemlock	30	Pine(s)
3	Red spruce	56	Baldcypress
4	Balsam fir	57	Loblolly pine
5	Red pine	58	Slash pine
6	White cedar	59	Longleaf pine
18	Tamarack	60	Shortleaf pine
29	Norway spruce	61	Jack pine
37	Black spruce	62	E. redcedar
38	White spruce		
7	Sugar maple	33	Sycamore
8	Red maple	34	Yellow poplar
9	Paper birch	35	Dead
10	Yellow birch	36	Black ash
11	Beech	39	Butternut
12	Red oak	40	Elm(s)
13	White oak	41	Balsam poplar
14	White ash	42	Hophornbeam
15	Aspen(s)	43	Shagbark hickory
16	Blk cherry	44	Pignut hickory
17	Basswood	45	Shell. hickory
19	Other hardwd	46	Mock. hickory
21	Black Birch	47	Sweetgum
22	Black gum	48	Silver maple
23	Black locust	49	Cherrybark oak
24	Black oak	50	Live oak
25	Black walnut	51	Bur oak
26	Chestnut oak	52	Overcup oak
27	Cucumbertree	53	Water oak
28	Hickory(s)	54	So. red oak
31	Sassafras	55	Cottonwood
32	Scarlet oak		

Timberpad Pro 2.0 ©, L.E. Caldwell, LLC, 2018

Species Codes Form Shown After Selecting the "Spp Codes" Button

Figure 7. Timberpad allows you to enter your own species codes, and TallTimber allows you to map in your own 1 or 2 character alpha-numeric codes. While a drop down menu of numeric codes is provided on the Species dropdown, we can modify your species dropdown at your direction. The above codes are the TallTimber defaults and are a lookup guide for people wanting to use the TallTimber codes, many of which have become somewhat standard in the Northeast. Tapping this screen returns you back to the Tally tab.



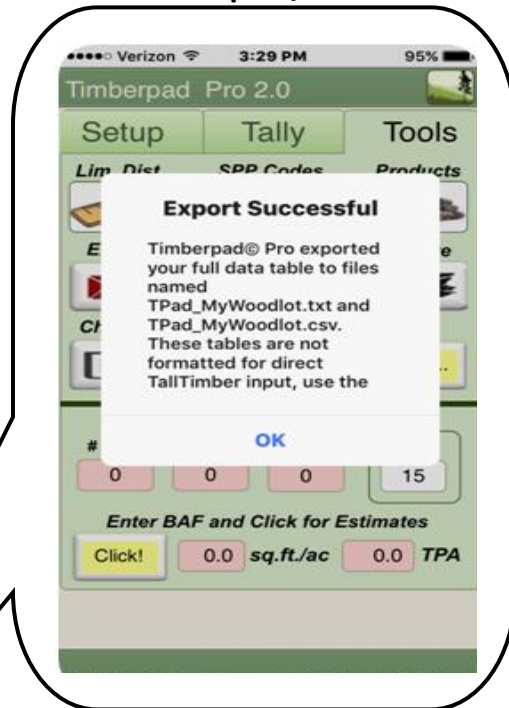
This is a scrollable screen, allowing you to save specifications and share them with your team or store in the cloud. Scrolling down allows entry of information on all 7 multiproduct codes.

Product Specifications Form (Android Platform)

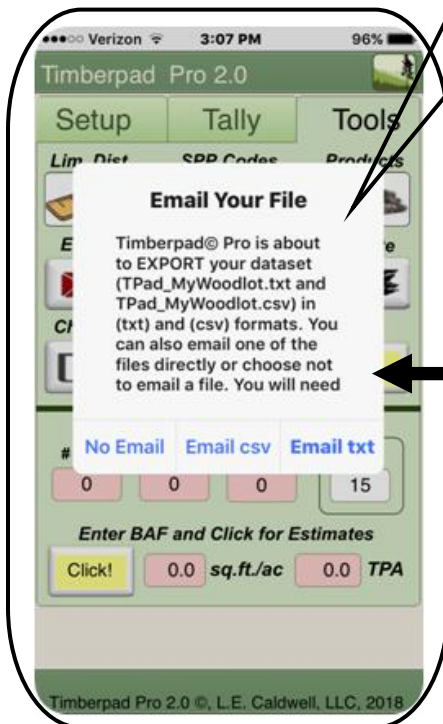
Figure 8. The Products form is most helpful for managers and those leading larger projects where teams of cruisers need to have consistent specs stored in a handy spot. The Products tool allows the writing and sharing of record specifications for the 7 product codes used in the Multi-Product system. There are 5 lines for the sawlog product (code 2) and 2 lines for all other products (sawlog products often have more detailed specs). Managers can export their file specifications and share with other cruisers for importing on to their device or store for future reference. Each of the above lines is scrollable to the right, creating adequate space for specifications. As mentioned at the top of the page, the form itself is scrollable up and down. Those not using Multi-Product mode can also readily use this tool for storing and sharing their product specifications, or simply as a note area.



After Export/Email



Before Export/Email



(iOS Platform)

Figure 9. Export Tool Dialogues: Exporting the entire TPad data table to text or csv file. As mentioned on page 59, the export function uses input field values from the first record for the file name (Android different than iOS). You have the option of emailing your dataset if an email software client has been established on your device and you have cell coverage or wifi.



1. Before Importing



2. Append or start fresh?



3. Successful import



(Android Platform)



Figure 10. Import Tool: Importing a TPad data table from a comma-delimited text file. The import function uses information in the FIRST RECORD to search for the file name. If no dataset exists on the device, you add a single new record and enter the proper values (see Figure 3, page 59) to match the dataset you wish to import. **The Import process provides the option of appending to the existing dataset or total replacement with the imported file.**

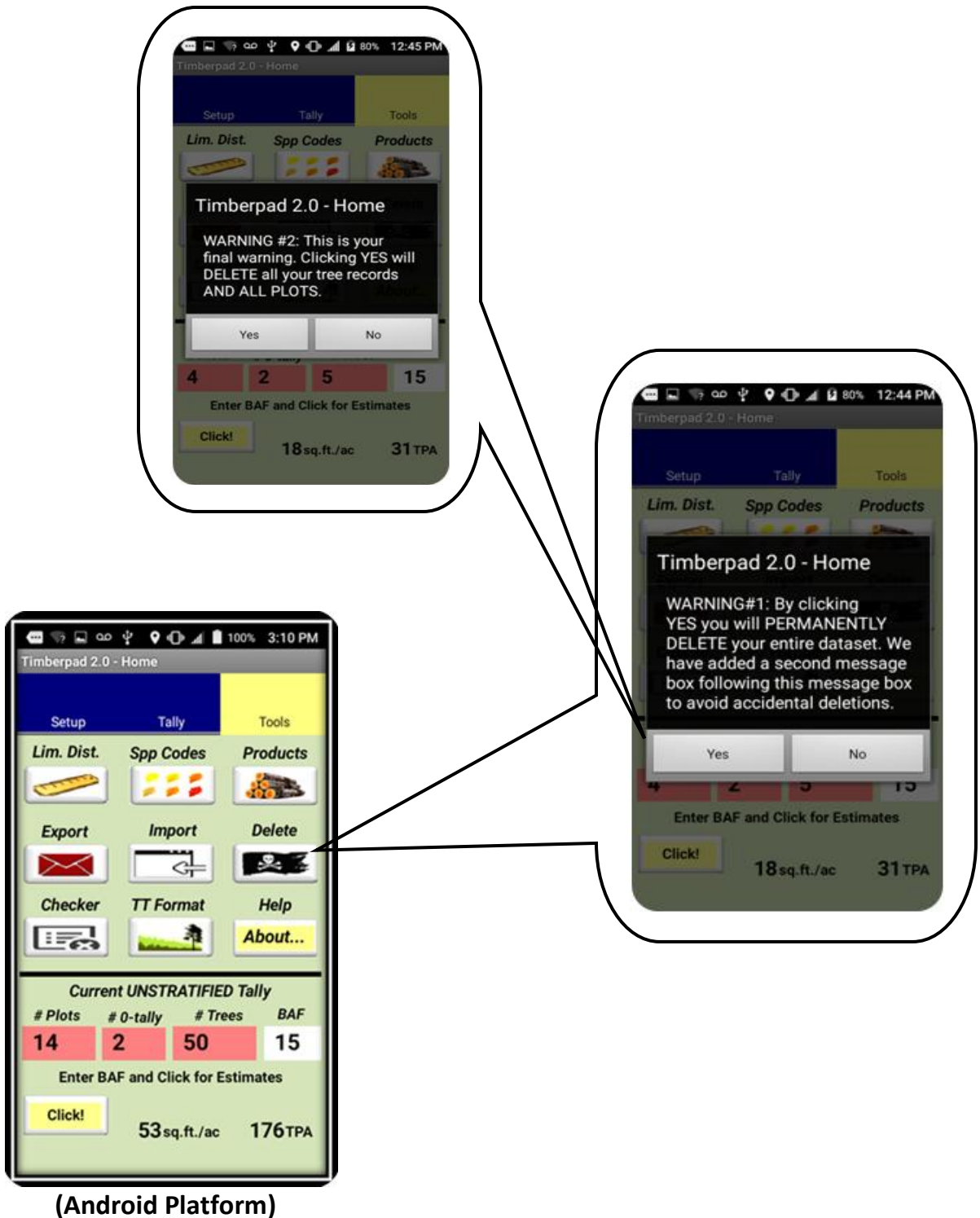
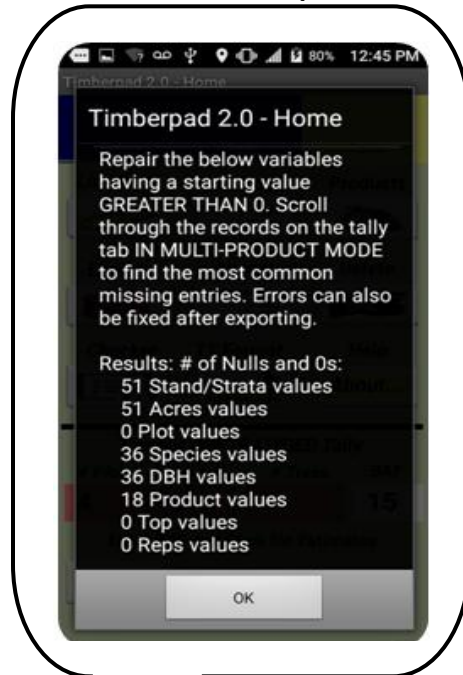


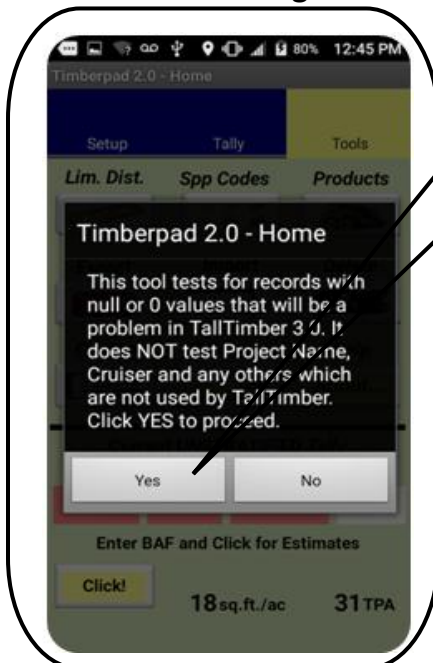
Figure 11. Delete Tool: Clicking this button launches a 2-step delete operation that will eliminate all tree records in TPad. You get 2 warnings to avoid accidental deletions. This function can also be accessed through the "hamburger" button (3 lines) on your device, if it has one. This does not eliminate log spec information stored on the Products tool.



Results of Checker (with errors)



First Message



(Android Platform)

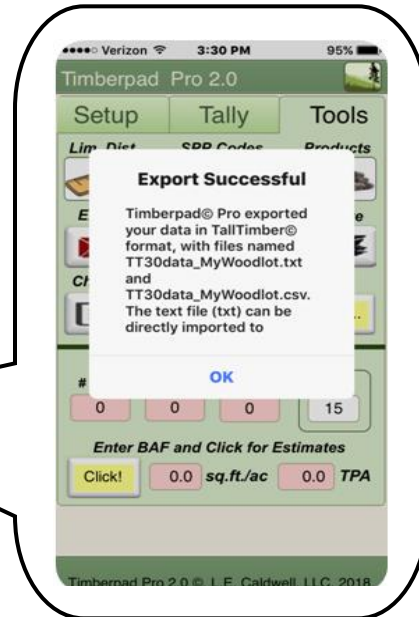
Figure 12. Null Checker Tool: The checker tool looks for 0's and Null values in all of the 9 variables necessary to create a TallTimber 3.0 input dataset. It does not check the other variables that may be collected, and is a helpful step in getting a sound dataset. The large dataset used for this diagram was purposely full of empty fields for illustration purposes.



Before Export/Email

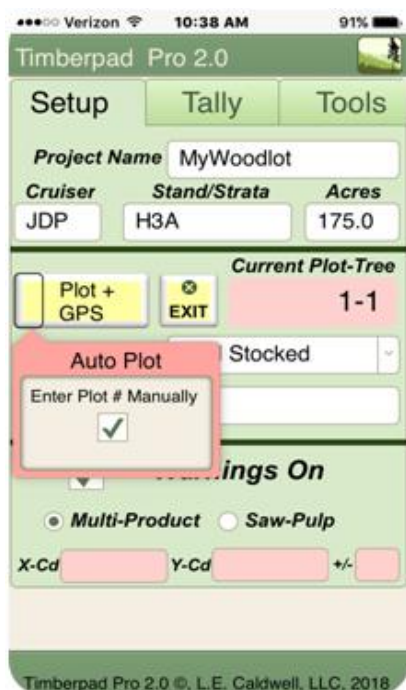


After Export/Email



(iOS Platform)

Figure 13. TT Format Tool: This exports a data file with the 9 variables required by TallTimber 3.x, making a TallTimber ready input file with correct headings and variables. The filename is based on the Project Name on the Setup Tab, shown above as "MyWoodlot". This produces a file named "TT30data_MyWoodlot.txt" as stated in the popup message. An overwrite warning message appears if you attempt to export a file with the same name as an existing file on their device. You are given a choice of emailing this file or just writing it to the device.



iOS



Android

Manual Plot Numbering Activated by a Checkbox

Figure 14. Timberpad's default is an automatic plot numbering system which automatically increments (+ 1) to the largest plot number whenever the "Plot+" or "Plot+GPS" buttons are clicked. Manual plot numbering is turned on by selecting the checkbox in either the popover button (iOS) or the checkbox near the Plot+GPS button (Android). Plot numbers must be integer values.

The "Plot+" and "Plot+GPS" buttons are how you typically add a new plot to your dataset, and they do this as tree 1 for the new plot (plot 1 tree 1, plot 2 tree 1, plot 3, tree 1, etc.). At times, however, you may want to assign a different plot number than the naturally incremented + 1 method, we call this manual plot numbering. As described below, the manual plot numbering process differs somewhat between the two Timberpad platforms. In either case, cruisers need to pay attention that they don't enter a plot number that already exists in their dataset when using the manual numbering option.

iOS: Timberpad iOS uses a popover button checkbox (shown above in iOS image) that, when checked, will cause the Plot+ buttons to open a keyboard for your manual plot number entry.

Android: By selecting a checkbox near the "Plot+GPS" button (shown), Timberpad Android reveals an edit box on the Tally tab where the cruiser then enters the plot number. After typing in the new plot number, the cruiser goes to the Setup tab and clicks the "Plot+GPS" button, creating the new plot. The edit box goes away when the checkbox is deselected.



Versions of Timberpad and Runtime Licenses

TPad licenses are available as Demo, Student, and Professional versions for both Android and Apple's iOS platforms. The Demo versions are available for download from our website for free, and have no time limitation. They have pop-up messages that occur at different times encouraging you to consider buying the full version and are limited to 3 points or 50 trees per dataset. They demonstrate the functionality to prospective buyers of TPad. You can get usable data from the Demo versions and the limiting distance calculator and products tool are useful themselves. Timberpad Student is a "pay-for" version allowing 30 points per export dataset and has several functional restrictions for a price that recognizes the budgeting needs of the aspiring timber cruiser/forester. Below are the versions of TPad currently available.

- Timberpad 2.0 Demo - Android or iOS
- Timberpad 2.0 Student - Android or iOS
- Timberpad 2.0 Pro - Android or iOS
- Timberpad 2.0 Pro - vintage Windows Mobile (less functionality, for older hardware)

Similar to needing Microsoft Excel to create Excel spreadsheets, TPad requires you to have its runtime environments installed on your device, too. The Android version of TPad requires the installation of the runtime environment DroidDB (<http://droiddb.syware.com/store/free-trial.php>), while the iOS version requires FileMaker Go, and lastly the Windows Mobile version requires the runtime environment of Visual CE (<http://syware.com/store/>).

FileMaker Go is a free download from the AppStore, and easily installs on your tablet or phone. DroidDB runtime is available for free in the trial version or as a purchased license for \$5 from the DroibDB website noted above. People still using the older Windows Mobile will need to spend a bit more for a runtime environment with the Visual CE license costing \$129 on the Syware website.

You can download and install those runtime programs or consult with us on getting them installed. To be clear, the process is to install the runtime environment (either free or purchased from the above sites) and then install TPad. If you struggle with the installation process we encourage you to call, email us for guidance, or consider letting us do the installation by mailing us your device(s) or having them new devices shipped to us directly. At this time we are not charging to install your software and do species code customizations.



Moving from Timberpad to TallTimber

Information logged into Timberpad can be transferred easily by cabling to a desktop system and simply using a file browser, by exporting comma-delimited text files via email, or bringing files into an Excel spreadsheet. The comma-delimited text file approach allows simple and easy copy and paste file movement, while also opening the door to remote sharing and storing of the data. This would involve emailing to yourself, the cloud or another party, storing it on a micro SD card on your device, or bluetoothing it to another local device. In any event, the question then becomes how will we process this data, turning it into information. We suggest TallTimber 3.5 as the best tool for doing just that.

The TT Format tool shown in Figure 12 is the path for the fastest processing via TallTimber. An example of the resultant text file output is shown below in Figure 15. TallTimber has import functionality that accommodates importing either a text file in this format, or an Excel spreadsheet as shown earlier in this manual and on our YouTube Playlist Video #1: Input Data Formats. Additional error checking occurs during the TallTimber import process (Step 1 in TallTimber).

```
Type,Acres,Plot,Spp,DBH,Product,AGS/UGS,Top,Reps,
"H3B",174,1,"HM",17.0,"1223555","",4,1,
"H3B",174,1,"WA",15.0,"22222555","",4,1,
"H3B",174,1,"YB",19.0,"523555","",4,1,
"H3B",174,1,"RM",8.0,"66555","",4,1,
"H3B",174,1,"RM",14.0,"5555555","",4,1,
"H3B",174,1,"WP",22.0,"22222555","",4,1,
"H3B",174,1,"WP",8.0,"777","",4,1,
"H3B",174,1,"BF",5.0,"66","A",4,1,
```

Figure 15. Above is an example of the TallTimber ready text file that is output by the TT Format tool on the Tools tab. Species can be alpha or numeric, DBH can be integer or decimal, AGS/UGS can be null as shown in all but the last record, which is an "A". This Point 1 had 8 trees.



Quick Start Comments and Tips

1. Data is entered into a single table for both formats. TPad Android has a folder named TPad under the DCIM folder, where all operating files go. Android exports are made to a folder name Data, located as follows (/DCIM/TPad/Data). iOS exports are viewed in FileMaker Go.
2. You create records one at a time by clicking either the Plot+ button to start a new plot with its first tree (plot 1 tree 1, shows as 1-1 on the device) or the Tree+ button to add additional tree records beyond tree 1. New plots are always the highest plot number + 1 if in autoplot mode, or whatever integer you enter for a plot number while in manual plot mode.
3. New trees are added to the plots by clicking the Tree+ button. These will be added to the plot you are currently in, and would start with Tree 2. For example, if you have one record in your table, 1-1, adding a tree will add the record 1-2 (plot 1, tree 2). Trees are always numbered the last tree number + 1.
4. Using the Tally tab's grid object, you can scroll through and jump around your entire data table editing a tree or a plot quickly wherever necessary. Android jumping is done by pressing on the record you wish to jump to, iOS has jump buttons on the right side of the table.
5. It is highly recommended that you be sure to enter the Setup tab information to the first record you create. This information will then be copied forward and you won't have to enter it anymore, avoiding nulls and missing information to be filled in later. The first record info is used when you export, so be thoughtful in your entries of Project Name, Stand/Strata, and Cruiser for record 1. If you have a stratified sample and are adding different stands, you need to update the stand information as you start collecting data for a new stand. Lots of jumping in and out of stands or strata is possible, but not ideal from an efficiency standpoint.
6. If you are trying to import a product specs file or a dataset and Timberpad returns an error message that the file does not exist, try two things. First, make double sure the file exists on your device with the proper name as shown in record 1 of your dataset. If your file does exist in the proper folder, then the problem is likely that your device's registry needs to be refreshed. You can refresh the device's awareness of the files by performing an export of some file, or perhaps turning it off and on. We have had the most luck by exporting a TPad table. Be sure not to overwrite any important files and then delete the unnecessary file after the export and retry the import.
7. Getting data out of Timberpad is easily done by exporting a text file and then using email, Bluetooth or copy-paste to other devices. Storing data in the cloud is a great way to backup as you transition from the woods to your office or lodging while in the field and when cell coverage permits. Micro SD card transfer is possible on some devices. Lastly, synching to an MS-Access database (TPad.mdb) via USB cable is an option for Android, though less commonly done. It requires the DroidDB software be installed on your computer.



Instructional Videos: Help with Timberpad

YouTube Channel TTimber, organized in a Playlist at this link:

<https://www.youtube.com/playlist?list=PLaZotM2nHrOQybWg8b52w1n5MFIY0uAut>

Video Number

0. Installing the Demo and Pro License Versions
1. Layout and Overview
2. Exploring the Tally Tab
3. Entering Data with the Tally Tab
4. Tallying in Saw-Pulp Height Mode
5. Exploring the Tools Tab
6. Exporting and Importing Data
7. Exporting Files and the TallTimber Processor
8. Timberpad Pro Overview: Introducing iOS