

Fundamental Training and Applications of the Landscape Management System

For NRCS and Conservation District Forestry Personnel

February 10th, 2009 – Pack Forest, Eatonville, WA

February 12th, 2009 – Spokane, WA

Growing and Treating Stands

- Growing Stands
- Evaluating Stand Growth with Tables and Visualizations
- Treating Stands

Growing and Treating Stands

This section presents information on how to accomplish management simulations using LMS. Frequently foresters must prepare different management alternatives for individual stands and then present the outcomes over time. The growth and treatment capabilities of LMS can assist in this endeavor by providing tools that foresters can use to make better management comparisons and subsequent management decisions.

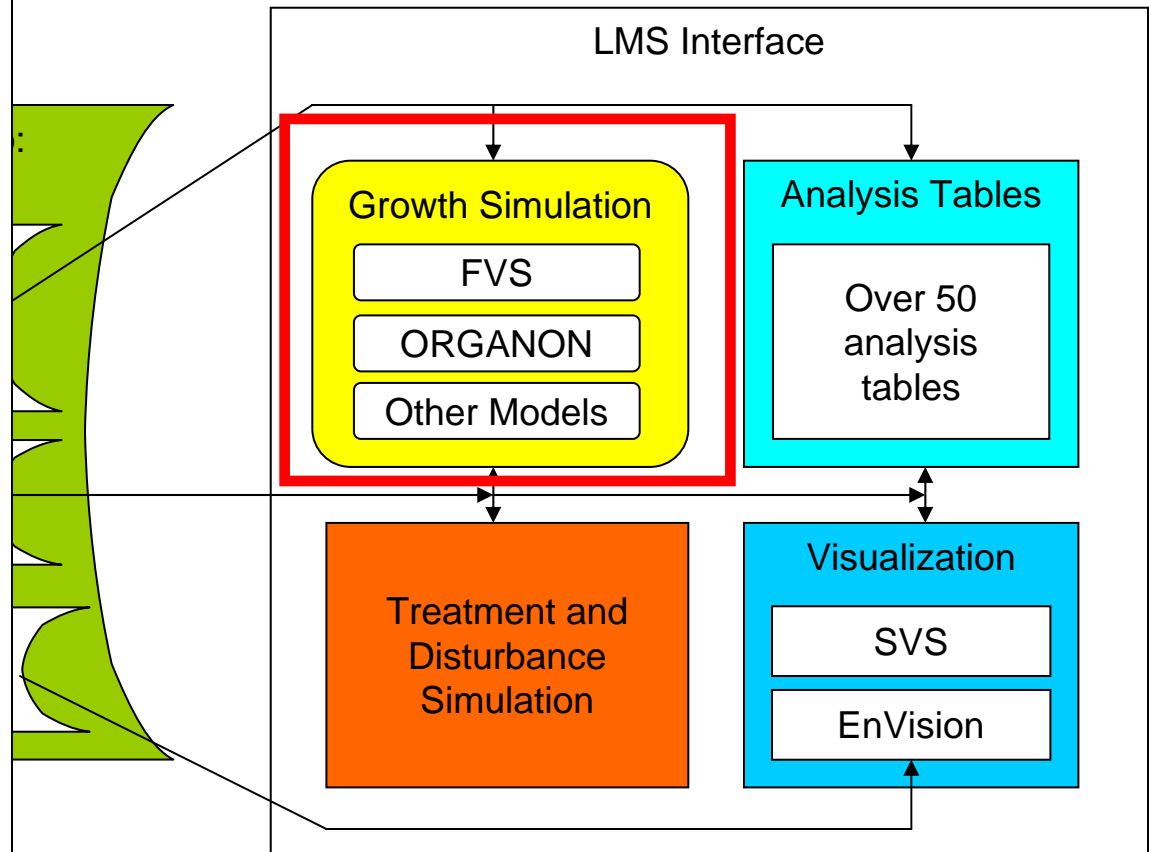
Roadmap

- Simulate forest growth using the growth models in LMS
- Simulate silvicultural treatments in a specific year
 - Remove all trees between 2" and 15" DBH
 - Thin to 75 TPA from below
- Simulate post-treatment growth
- Compare changes in stands caused by treatment in a composite graph in Excel

Growth Modeling with LMS

Growth modeling in LMS is done in the Growth Simulation module. LMS uses a variant of the USFS Forest Vegetation Simulator (FVS), covering nearly all areas of the US with trees, and the ORGANON model from Oregon State University for areas west of the Cascades in Washington and Oregon. Also, since LMS has a modular design, other models can be used as well if an interface is developed (more on this later).

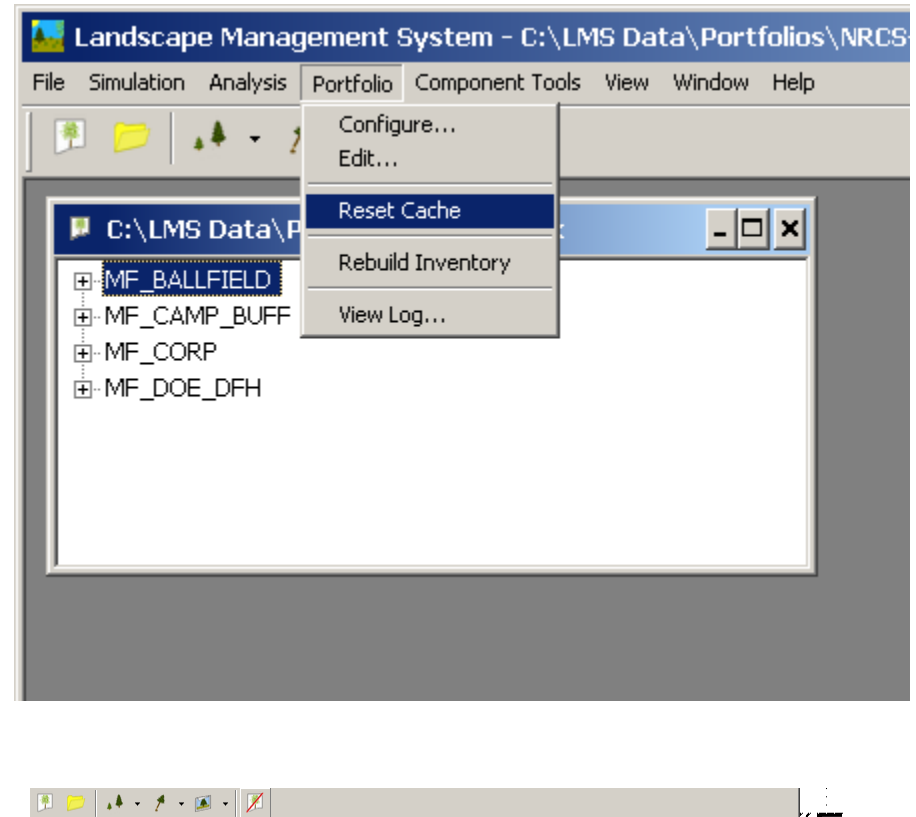
For this exercise we will be using the PN or IE variants of the FVS growth model.



Resetting (“Flushing”) the Cache

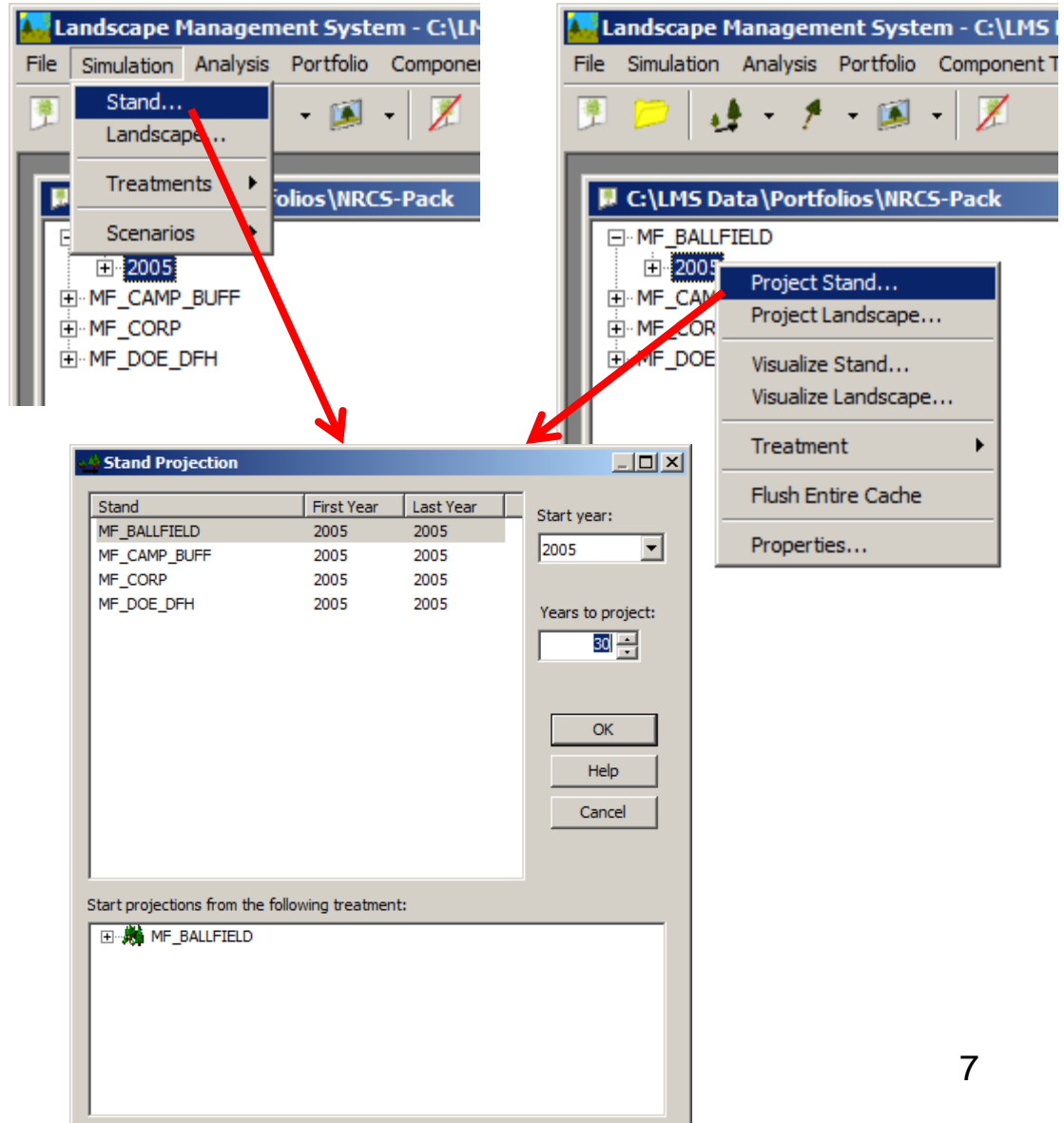
LMS does all treatments and growth on a set of temporary files that are stored in the LMS Cache directory. Working with a copy of the inventory and attributes files gives the ability to return to the initial stand conditions of the portfolio. Before moving on to growing stands the Cache will need to be flushed to get rid of any treatments that were performed previously. Reset the cache using the “Portfolio/Reset Cache” menu command or the Reset button on the toolbar.

Note: Any files that have been saved in the portfolios cache directory will also be deleted. If files are to be saved they must be saved in a different location.

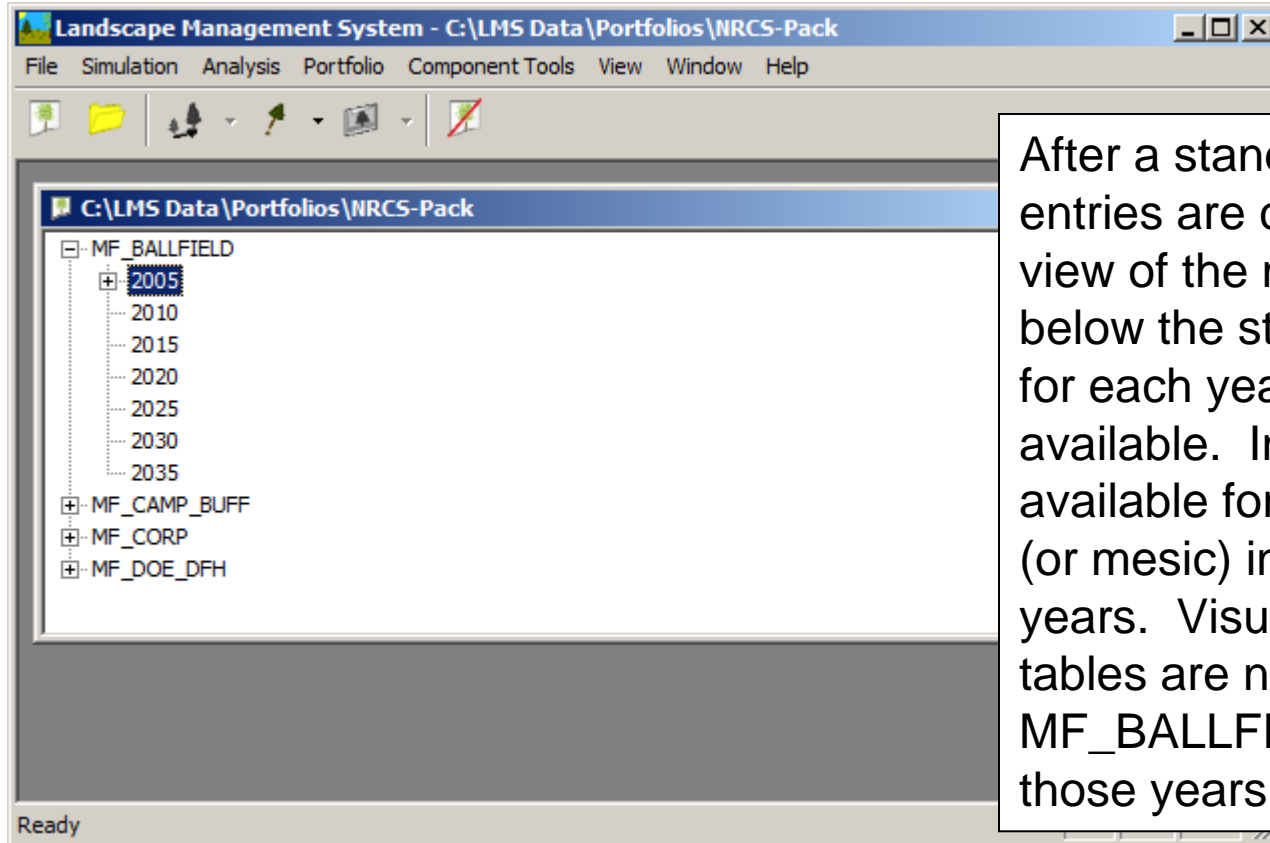


Growing Stands

Growing stands is done from the Stand Projection dialogue which is accessed by selecting “Stand...” from the LMS Simulation drop-down. The Stand Projection dialogue contains a list of stands in the left pane and drop-down lists of years for Start Year and a box for number for Years to Project. For this exercise MF_BALLFIELD (or mesic) will be grown for 30 years. Select the stand name from the list and change “Years to project” to 30. Click OK and the growth will begin.

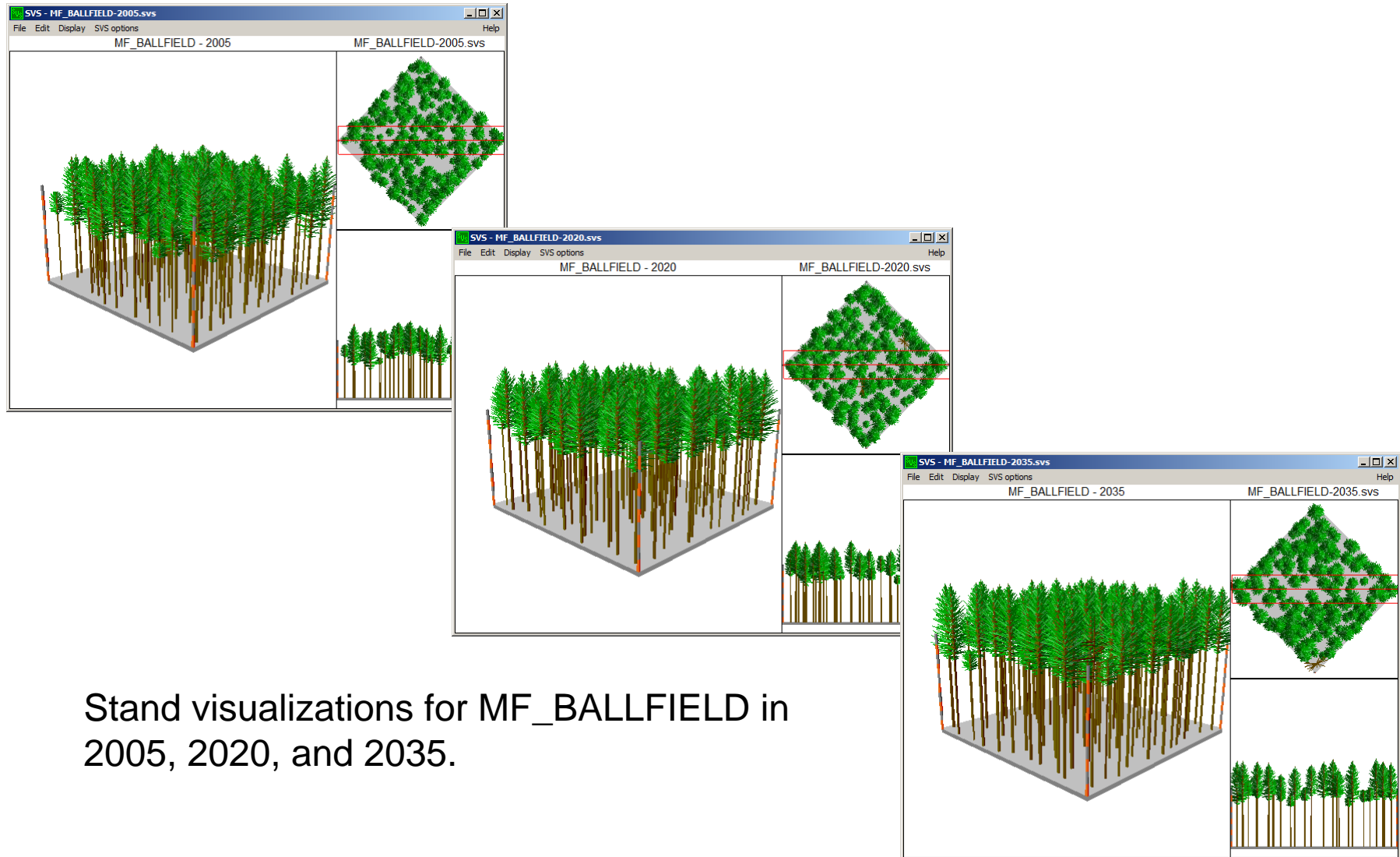


Growing Stands

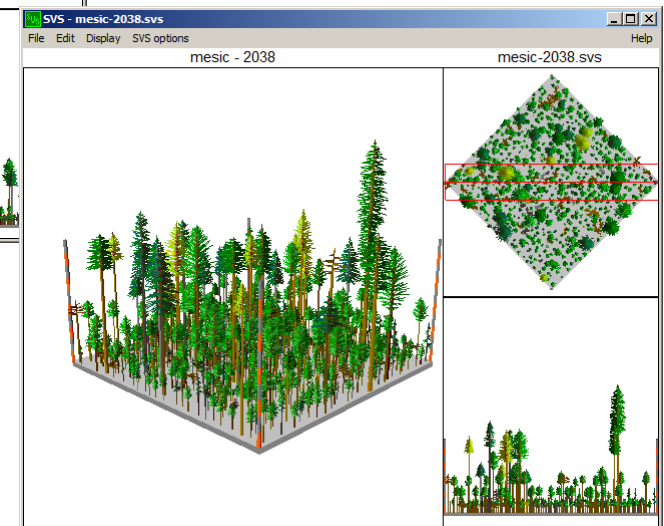
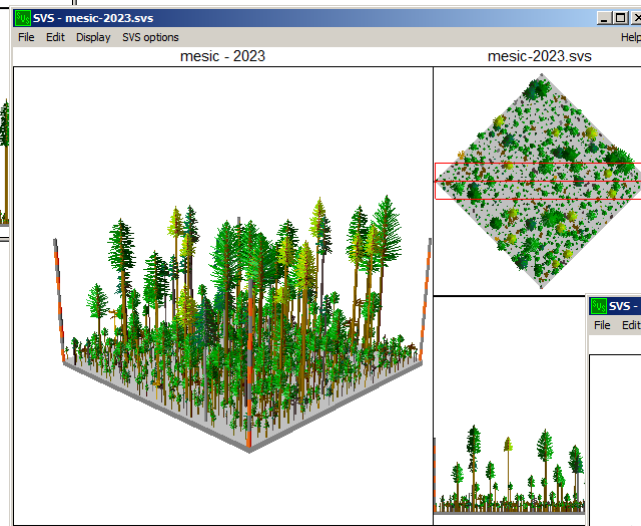
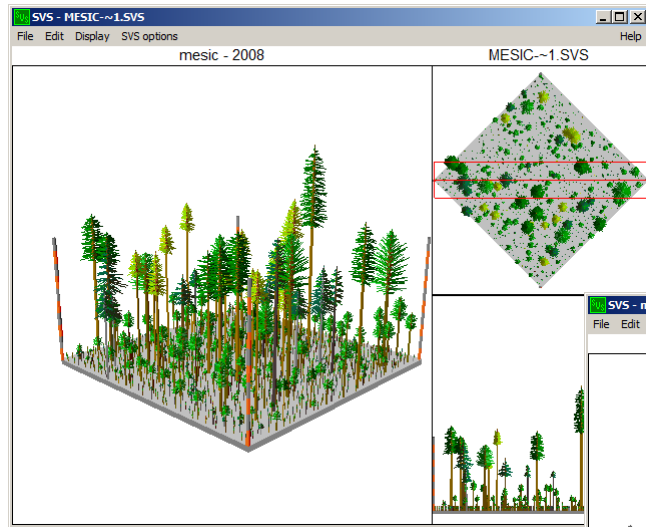


After a stand have been grown, entries are created in the tree view of the main LMS window below the stand that was grown for each year that data area available. In this case data are available for MF_BALLFIELD (or mesic) in seven different years. Visualizations and tables are now available for MF_BALLFIELD (or mesic) for those years.

Looking at Growth using SVS



Looking at Growth using SVS



Stand visualizations for mesic in 2008, 2023, and 2038.

Changes in QMD

Displaying changes in QMD over the 30-year stand projection will be done using the Stand Summary Total table template and Excel. First, create the Stand Summary table Using Analysis/Advanced... then select the Stand Summary table, leave all years highlighted and then clear the checkbox next to the other stands that we are not currently interested in. The resulting table opens in Excel.

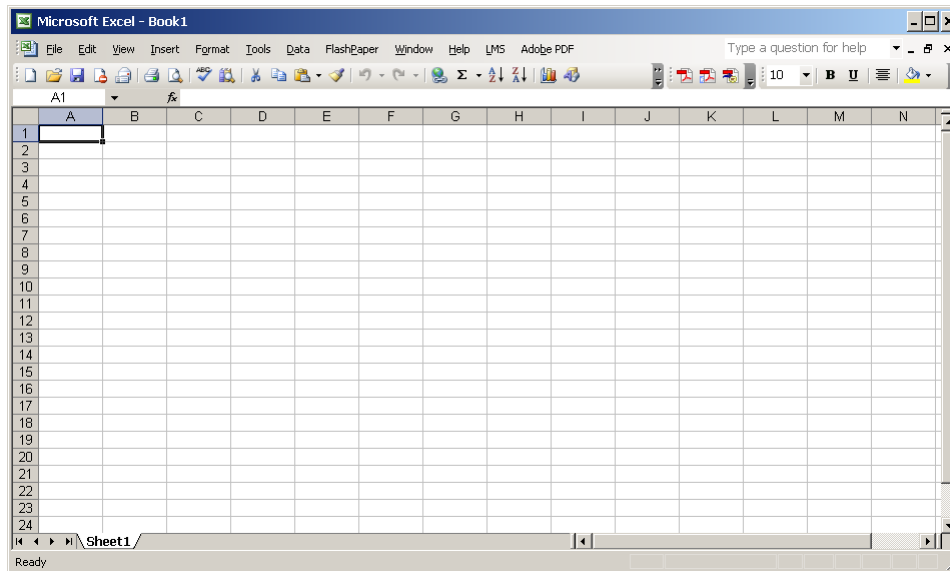
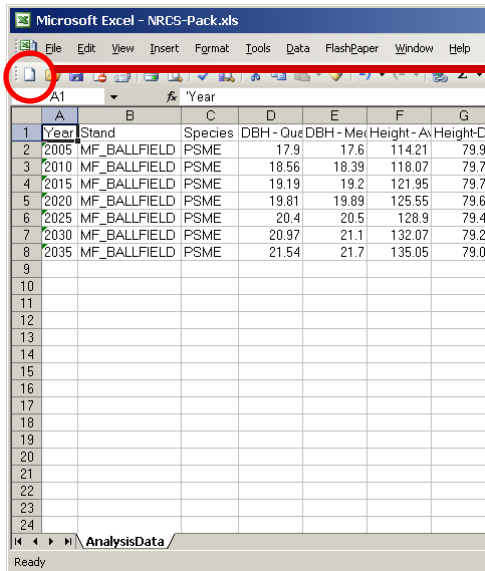
The screenshot shows the Landscape Management System (LMS) interface. The 'Analysis' menu is open, and the 'Advanced...' option is selected. The 'Select the Template' dialog box is displayed, showing the 'Stand Summary' table template selected. The 'Specify the Years' list includes 2005, 2010, 2015, 2020, 2025, 2030, and 2035. The 'Specify the Stands' list includes MF_BALLFIELD, MF_CAMP_BUFF, MF_CORP, and MF_DOE_DFH. The 'Output To' dropdown is set to 'Excel File'. The 'OK' button is highlighted.

The resulting Excel spreadsheet, titled 'Microsoft Excel - NRCS-Pack.xls', displays the data for the 'Stand Summary' table. The data is organized into columns: Year, Stand, Species, DBH - Out, DBH - Me, Height - A, Height - B, Trees per, Basal Area, Relative C, Stand Der, Volume - T, Volume - T, and Volume - T. The data is filtered for the year 2005 and the stand MF_BALLFIELD.

Year	Stand	Species	DBH - Out	DBH - Me	Height - A	Height - B	Trees per	Basal Area	Relative C	Stand Der	Volume - T	Volume - T	Volume - T
2005	MF_BALLFIELD	PSME	17.9	17.6	114.21	79.94	127.27	222.63	52.6	324.08	52641	10489.78	10039.74
2010	MF_BALLFIELD	PSME	18.56	18.39	118.07	79.78	124.8	234.57	54.44	336.63	58481.77	11350.78	10928.06
2015	MF_BALLFIELD	PSME	19.19	19.2	121.95	79.79	122.31	245.73	56.09	348.04	63821.04	12181.7	11757.52
2020	MF_BALLFIELD	PSME	19.81	19.89	125.55	79.67	119.81	256.49	57.62	358.73	69042.23	12997.3	12546.63
2025	MF_BALLFIELD	PSME	20.4	20.5	128.9	79.49	117.32	266.35	58.96	368.22	73120.37	13792.06	13199.08
2030	MF_BALLFIELD	PSME	20.97	21.1	132.07	79.27	114.84	275.68	60.18	376.93	79268.35	14560.39	14101.07
2035	MF_BALLFIELD	PSME	21.54	21.7	135.05	79.01	112.38	284.54	61.3	384.96	82442.47	15274.16	14577.07

Changes in QMD

To compare changes in QMD between treatments, the QMD and Year columns will need to be copied to a new Excel workbook. Create a new workbook by clicking on “New Workbook” at the left end of the Excel tool bar or by selecting “New...” from the Excel file menu. A blank workbook will be created.



Copy Year and QMD to new Workbook

Microsoft Excel - NRCS-Pack.xls

File Edit View Insert Format Tools Data FlashPaper

D1 DBH - Quadratic Mean

	A	B	C	D	E
1	Year	Stand	Species	DBH - Quadratic Mean	DBH - Mean
2	2005	MF_BALLFIELD	PSME	17.9	17.6
3	2010	MF_BALLFIELD	PSME	18.56	18.39
4	2015	MF_BALLFIELD	PSME	19.19	19.2
5	2020	MF_BALLFIELD	PSME	19.81	19.89
6	2025	MF_BALLFIELD	PSME	20.4	20.5
7	2030	MF_BALLFIELD	PSME	20.97	21.1
8	2035	MF_BALLFIELD	PSME	21.54	21.7
9					
10					
11					
12					
13					
14					
15					
16					
17					

Microsoft Excel - Book1

File Edit View Insert Format Tools Data FlashPaper

A1 Year

	A	B	C	D	E
1	Year	DBH - Quadratic Mean			
2	2005	17.9			
3	2010	18.56			
4	2015	19.19			
5	2020	19.81			
6	2025	20.4			
7	2030	20.97			
8	2035	21.54			
9					
10					
11					
12					
13					
14					
15					
16					
17					

Microsoft Excel - Book1

File Edit View Insert Format Tools Data FlashPaper

B2 17.9

	A	B	C	D	E	F
1	Year	No Treatment				
2	2005	17.9				
3	2010	18.56				
4	2015	19.19				
5	2020	19.81				
6	2025	20.4				
7	2030	20.97				
8	2035	21.54				
9						
10						
11						
12						
13						
14						
15						
16						
17						

Copy the Year and Stand columns (columns A and D) by selecting column A, and then hold the Ctrl key and select column D. Both columns should be highlighted. Then use Edit/Copy (or press the CTRL-C) to copy the data. There will be flashing dashed lines around the selected cells. Go to the new workbook and click on the A1 cell, then select Edit/Paster (or use CTRL-V). After copying the numbers change the column heading in B1 to "No Treatment". Then save the workbook somewhere so that we can access it later.

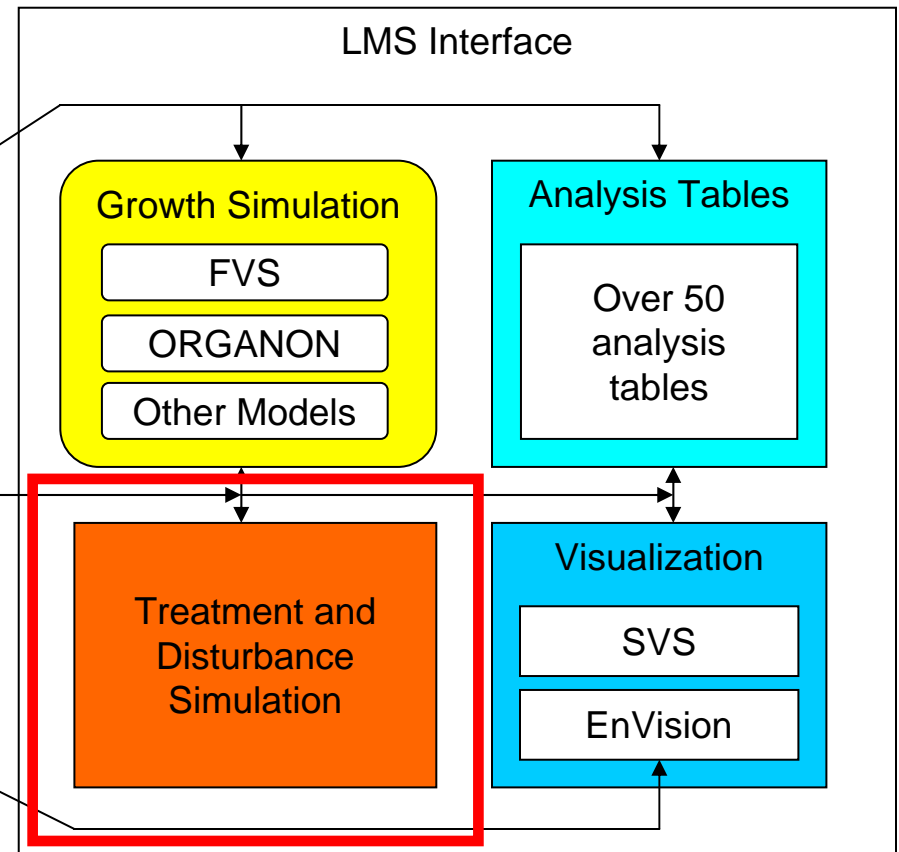
Growth Summary

Treating Stands and Treatment Effects

Learn how to treat stands using
LMS and examine treatment
effects using LMS

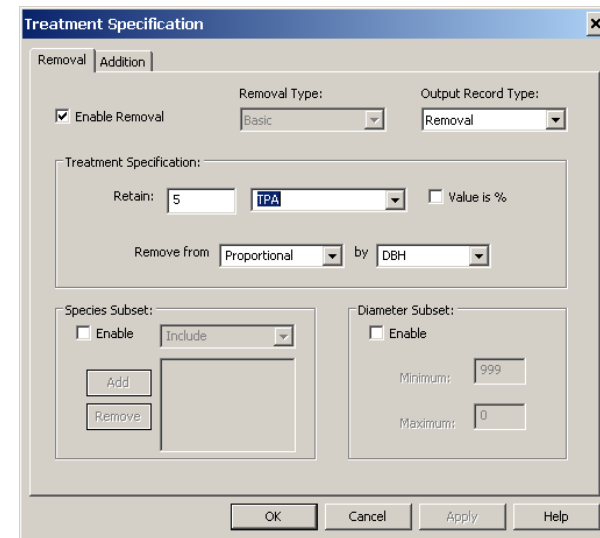
Stand Treatments with LMS

Stand treatments are done with LMS using the Treatment and Disturbance Simulation module of LMS. This module provides the tools needed to simulate silvicultural treatment or natural disturbances, such as windthrow, that remove trees from the stand. Regeneration, either planted or natural, can also be simulated.



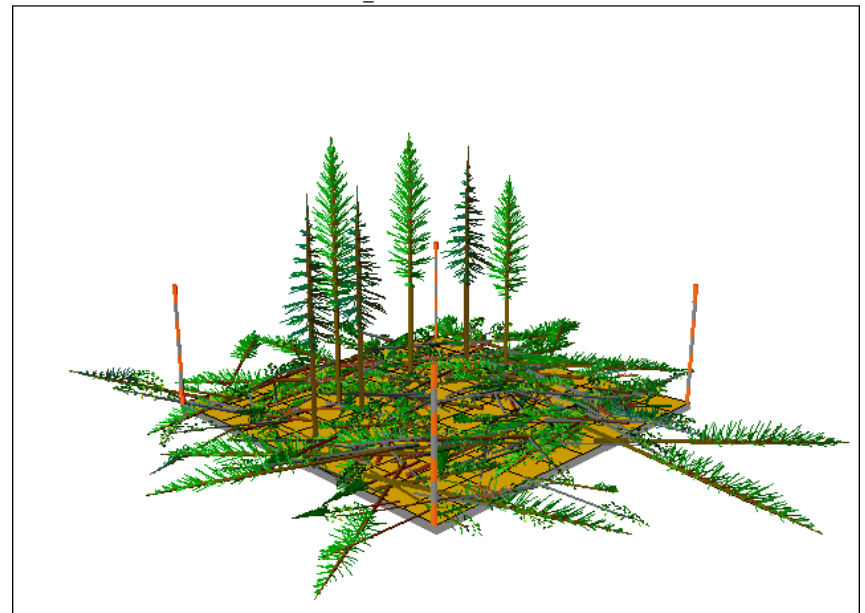
Treating Stands using LMS

LMS features a treatment program that allows the user to perform silvicultural treatments. Using the Treatment Definition dialog, stands can be thinned to a specified percent of original TPA, actual TPA, basal area, or SDI. Trees can be removed from below (taking the smallest trees first), proportional (taking trees equally from each tree record), or above (taking the largest trees first). Diameter ranges and species to include or exclude can also be defined to target specific species and diameter ranges. Multiple treatments can be performed on a stand in any year giving the ability to simulate complex prescriptions.



The screenshot shows the 'Treatment Specification' dialog box with the 'Removal' tab selected. The 'Enable Removal' checkbox is checked. The 'Removal Type' is set to 'Basic' and the 'Output Record Type' is set to 'Removal'. In the 'Treatment Specification' section, 'Retain' is set to '5' and 'TPA' is selected from the dropdown menu. The 'Remove from' dropdown is set to 'Proportional' and the 'by' dropdown is set to 'DBH'. The 'Species Subset' section has 'Enable' unchecked and 'Include' selected. The 'Diameter Subset' section has 'Enable' unchecked, with 'Minimum' set to '999' and 'Maximum' set to '0'. The dialog has 'OK', 'Cancel', 'Apply', and 'Help' buttons at the bottom.

BR_STEEPLES - 2000



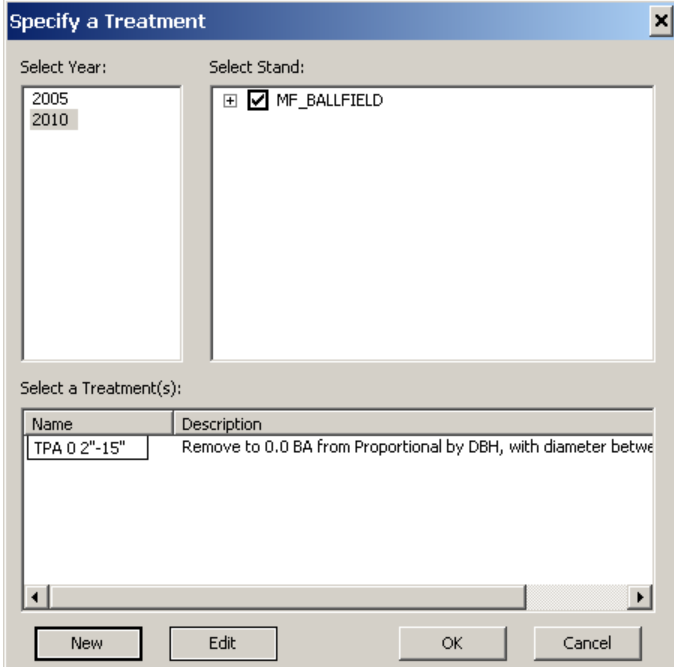
MF_BALLFIELD: Remove trees between 2" and 15"

The image shows a sequence of three screenshots from the Landscape Management System software. The first screenshot shows the 'Treatments' menu with 'Standard Treatments' selected, and a red arrow pointing to the 'Specify a Treatment' dialog box. The second screenshot shows the 'Specify a Treatment' dialog box with '2010' selected under 'Select Year' and 'MF_BALLFIELD' selected under 'Select Stand'. A red circle highlights the 'New' button at the bottom left, with a red arrow pointing to the 'Treatment Specification' dialog box. The third screenshot shows the 'Treatment Specification' dialog box with the 'Removal' tab selected. The 'Enable Removal' checkbox is checked, 'Removal Type' is set to 'Basic', and 'Output Record Type' is set to 'Removal'. Under 'Treatment Specification', 'Retain' is set to 0, 'TPA' is selected, and 'Value is %' is unchecked. 'Remove from' is set to 'Proportional' and 'by' is set to 'DBH'. Under 'Species Subset', 'Enable' is unchecked and 'Include' is selected. Under 'Diameter Subset', 'Enable' is checked, 'Minimum' is set to 2, and 'Maximum' is set to 15. The 'OK' button is highlighted.

In this example MF_BALLFIELD will be treated by removing all trees between 2" and 15". First grow the stand 5 years to 2010. Then treat the stand using the Simulation menu and selecting Treatments/Standard Treatments. In the dialog confirm the year and stand for treatment, then click "New" to create a new treatment. Select TPA, Enable Diameter Subset, and enter 2" and 15" for diameter limits. Click OK to save the treatment.

Applying Treatment

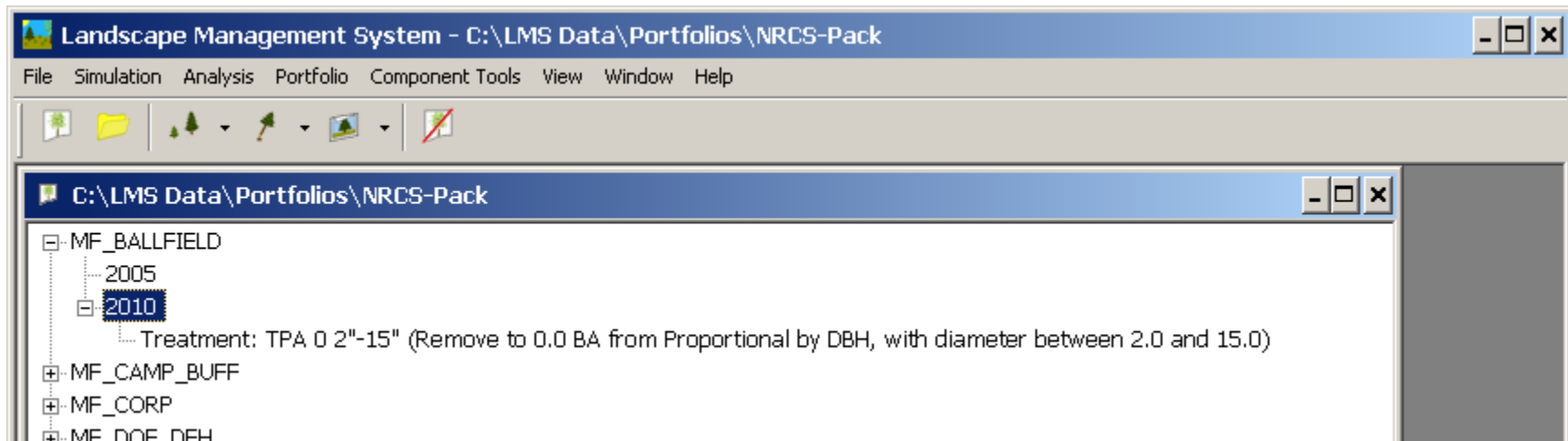
Applying the treatment is done after naming the treatment then selecting the year and stand. Name the treatment by changing New Treatment, under Name, to TPA 0 – 2” to 15”. Confirm that the year 2010 and stand MF_BALLFIELD are selected. Click OK, and the treatment will be applied. The results of the treatment will be shown in the portfolio window.



The 'Specify a Treatment' dialog box has three main sections. The 'Select Year:' section on the left contains a list with '2005' and '2010', where '2010' is highlighted. The 'Select Stand:' section on the right contains a list with 'MF_BALLFIELD', which has a checked checkbox next to it. The 'Select a Treatment(s):' section at the bottom contains a table with two columns: 'Name' and 'Description'. The table has one row with the name 'TPA 0 2"-15"' and the description 'Remove to 0.0 BA from Proportional by DBH, with diameter between 2.0 and 15.0'. At the bottom of the dialog are four buttons: 'New', 'Edit', 'OK', and 'Cancel'.

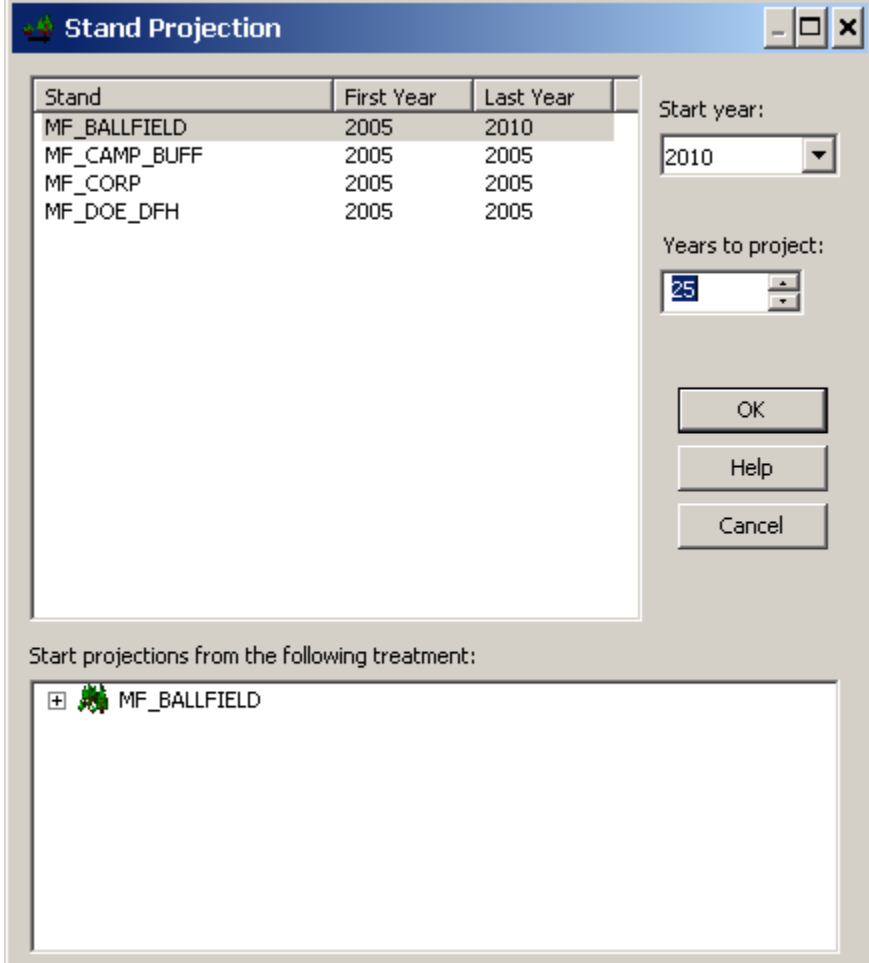
Select Year:	Select Stand:
2005 2010	<input checked="" type="checkbox"/> MF_BALLFIELD

Name	Description
TPA 0 2"-15"	Remove to 0.0 BA from Proportional by DBH, with diameter between 2.0 and 15.0



Grow MF_BALLFIELD to 2035

After applying the treatment, grow MF_BALLFIELD for 25 years by selecting MF_BALLFIELD in the Stand Projection dialog. Start year should be 2005 and Years to project should be 25. Click OK to grow the stand.



The image shows a software dialog box titled "Stand Projection". It contains a table with columns "Stand", "First Year", and "Last Year". The table lists four stands: MF_BALLFIELD (2005-2010), MF_CAMP_BUFF (2005-2005), MF_CORP (2005-2005), and MF_DOE_DFH (2005-2005). To the right of the table are input fields for "Start year:" (set to 2010) and "Years to project:" (set to 25). Below these are "OK", "Help", and "Cancel" buttons. At the bottom, there is a section labeled "Start projections from the following treatment:" which contains a list box with a tree icon and the text "MF_BALLFIELD".

Stand	First Year	Last Year
MF_BALLFIELD	2005	2010
MF_CAMP_BUFF	2005	2005
MF_CORP	2005	2005
MF_DOE_DFH	2005	2005

Start year: 2010

Years to project: 25

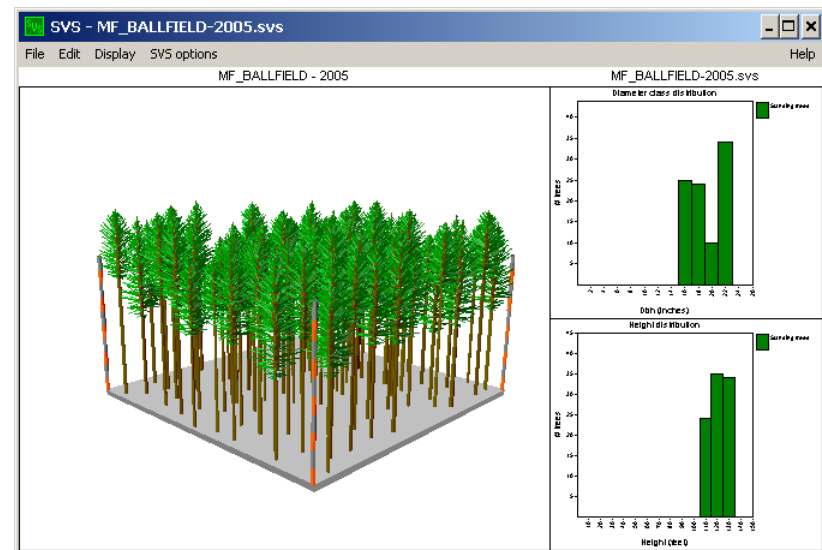
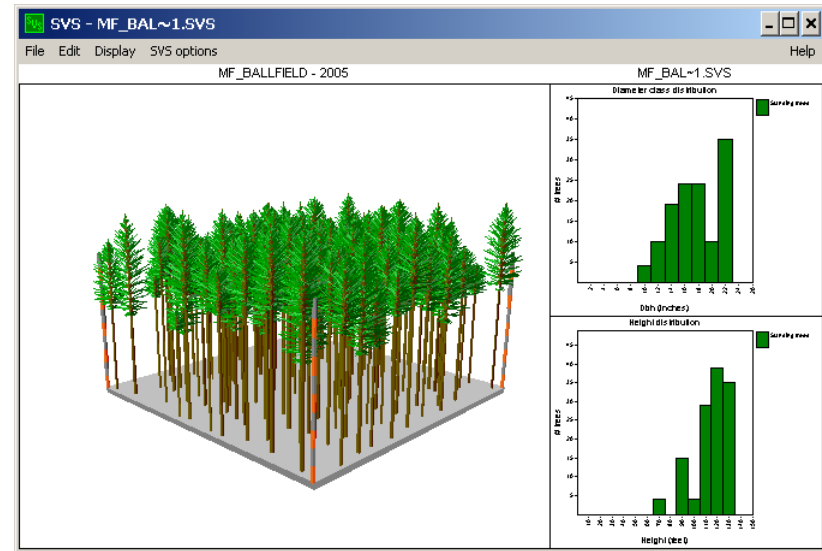
OK
Help
Cancel

Start projections from the following treatment:

- + MF_BALLFIELD

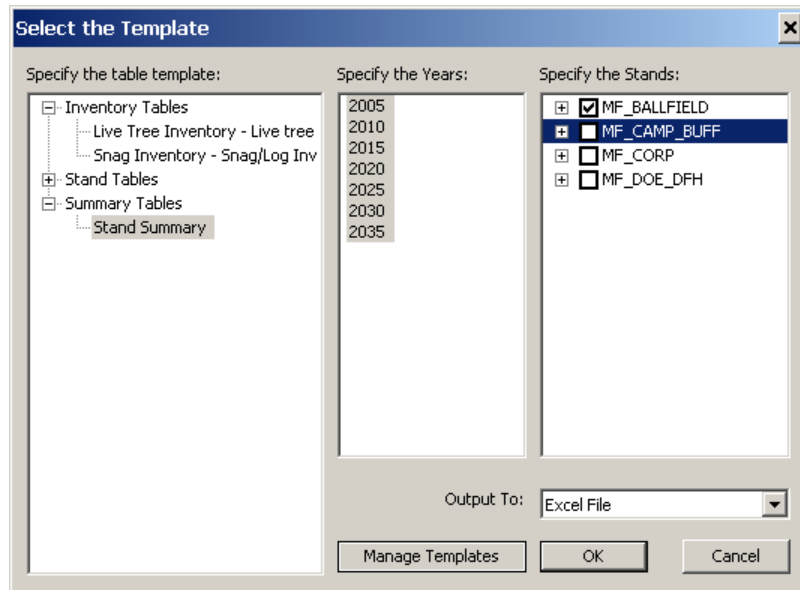
Getting reacquainted with the stand

- SVS images
 - Make a combined image to see what parts of the distributions were removed.
 - 3-view
 - Graphs with legends
- Tables
 - Stand Summary Total



Changes in QMD

Displaying changes in QMD over the 30-year stand projection will be done using the Stand Summary table template and Excel. First, create a summary table, then copy the Quadratic Mean Diameter column (D) to the spreadsheet we created previously.



Microsoft Excel - NRCS-Pack.xls

Type a question for help

DBH - Quadratic Mean

1	Year	Stand	Species	DBH - Quadratic Mean	DBH - Out	DBH - Me	Height - A	Height - B	Height - C	Trees per	Basal Area	Relative C	Stand Der	Volume - 1	Volume - 2	Volume - 3
2	2005	MF_BALLFIELD	MF_BALLFIELD	17.9	17.6	114.21	79.94	127.27	222.63	52.6	324.08	52641	10489.78	10039.74		
3	2010	MF_BALLFIELD	MF_BALLFIELD	19.71	19.3	123.76	77.18	100.86	213.75	48.14	299.56	54330.75	10509.57	10115.1		
4	2015	MF_BALLFIELD	MF_BALLFIELD	20.4	19.8	127.92	77.18	99.12	225.13	49.83	311.21	59776.76	11331.91	10956.99		
5	2020	MF_BALLFIELD	MF_BALLFIELD	21.06	20.3	131.77	77.18	97.35	235.69	51.34	321.71	64731.45	12161.1	11721.91		
6	2025	MF_BALLFIELD	MF_BALLFIELD	21.71	20.8	135.31	77.06	95.58	245.75	52.74	331.47	69917.84	12927.89	12477.28		
7	2030	MF_BALLFIELD	MF_BALLFIELD	22.35	21.5	138.59	76.81	93.8	255.59	54.06	340.8	74417.03	13697.61	13163.23		
8	2035	MF_BALLFIELD	MF_BALLFIELD	22.97	22.2	141.68	76.54	92.02	264.88	55.26	349.37	79429.22	14439.11	13878.21		

Microsoft Excel - Book1.xls

Type a question for help

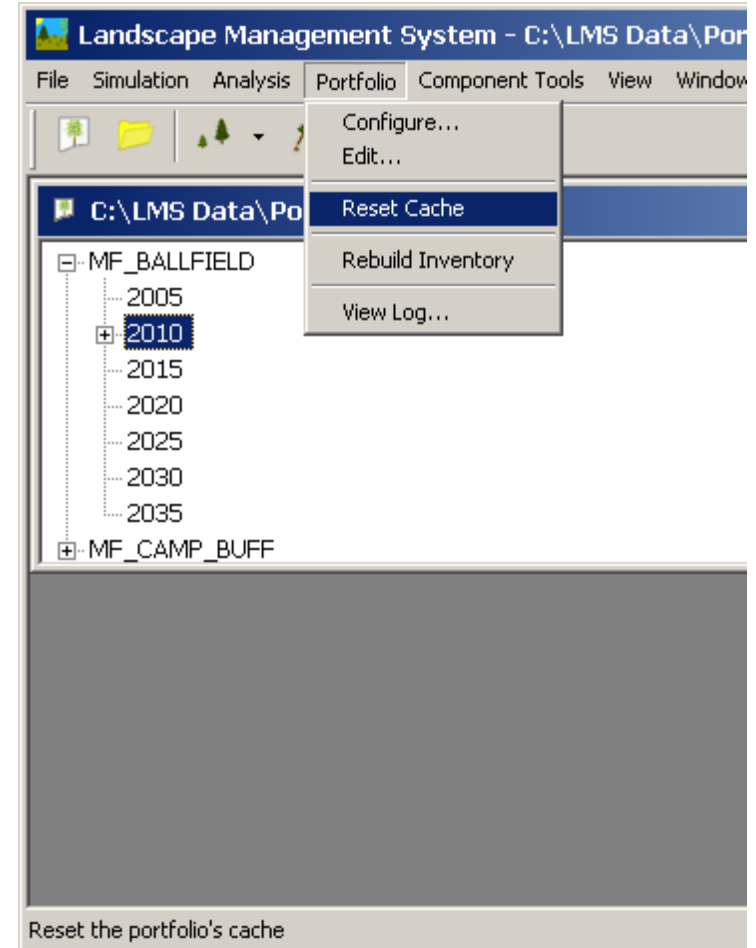
Thin 2-15

1	Year	No Treatment	Thin 2-15
2	2005	17.90	17.90
3	2010	18.56	19.71
4	2015	19.19	20.40
5	2020	19.81	21.06
6	2025	20.40	21.71
7	2030	20.97	22.35
8	2035	21.54	22.97

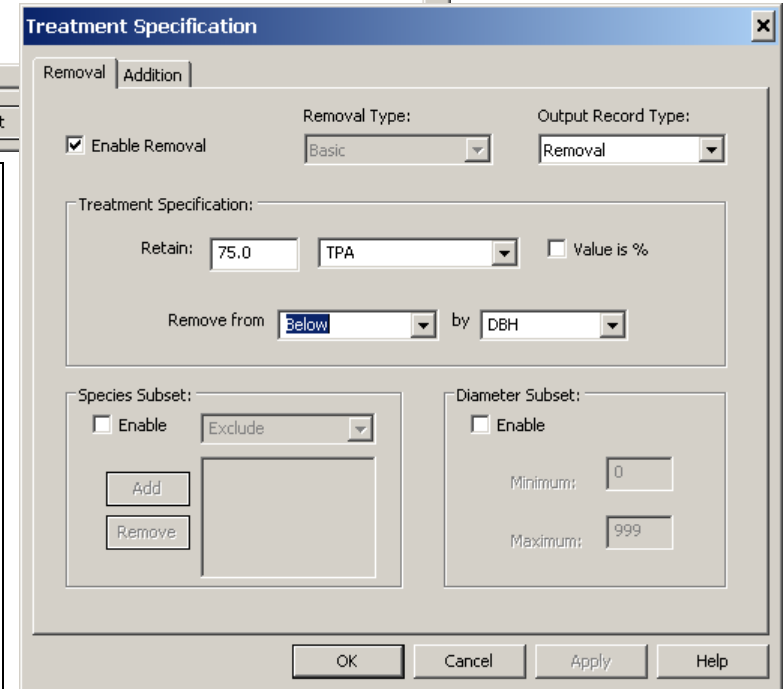
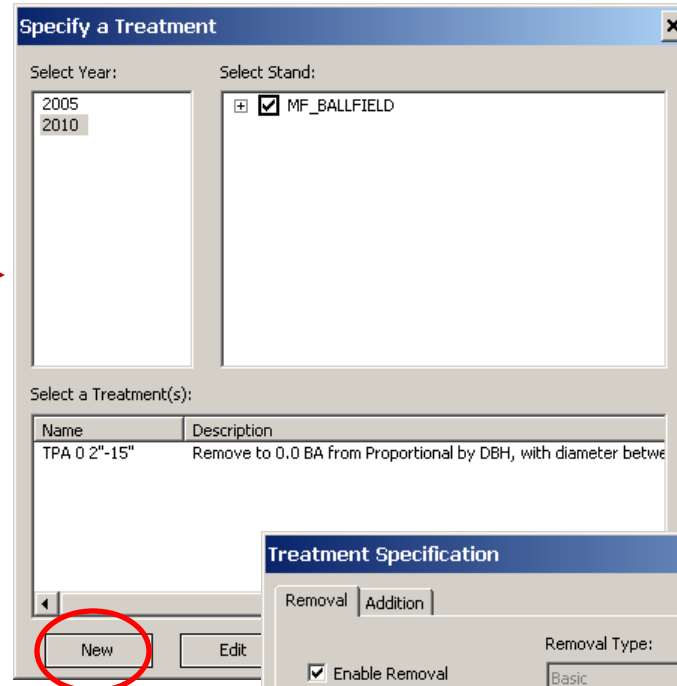
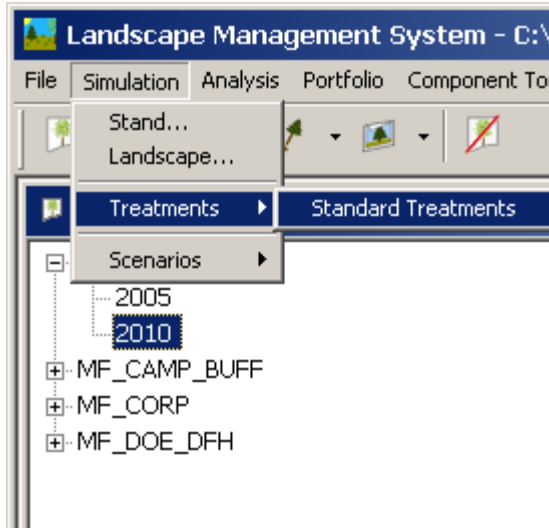
Treatment 2: Leave 75 TPA

To apply the next treatment to MF_BALLFIELD the cache needs to be flushed to eliminate the treatment that was just done. If the cache is not flushed, LMS 3.1 will perform the treatment on the trees left after the first treatment. In this case, all the trees between 2" and 15" will have been removed and the treatment applied in this section will leave 75 TPA of the remaining trees rather than 75 TPA of the original stand. Flushing the cache is done by selecting "Reset Cache" from the LMS Portfolio menu.

Note: Any files that have been saved in the portfolios cache directory will also be deleted. If files are to be saved, they must be saved in a different location.



MF_BALLFIELD: Leave 75 TPA

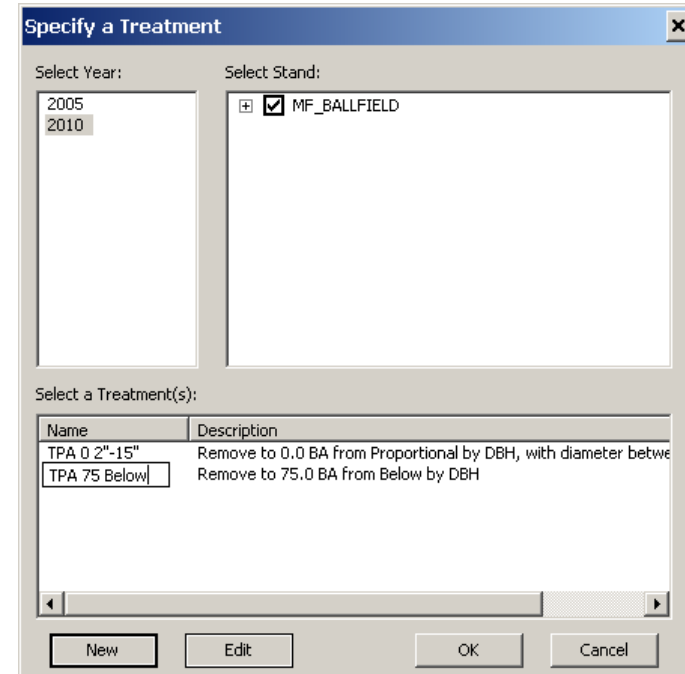


In this example MF_BALLFIELD will be treated leaving 75 TPA. Select Simulation / Treatments/Standard Treatments to open the Specify a Treatment dialog. Click “New” to create a new treatment. In the Treatment Specification dialog set “Retain” to 75, select “TPA” in the drop-down, and “Below” in the Remove from drop-down. Click OK, and name the treatment “TPA 75 Below”.

Applying Treatment

Names the treatment “TPA 75 Below”. Confirm the year, 2010, and stand name and click OK to apply the treatment.

Then grow the stand 25 years to 2031.

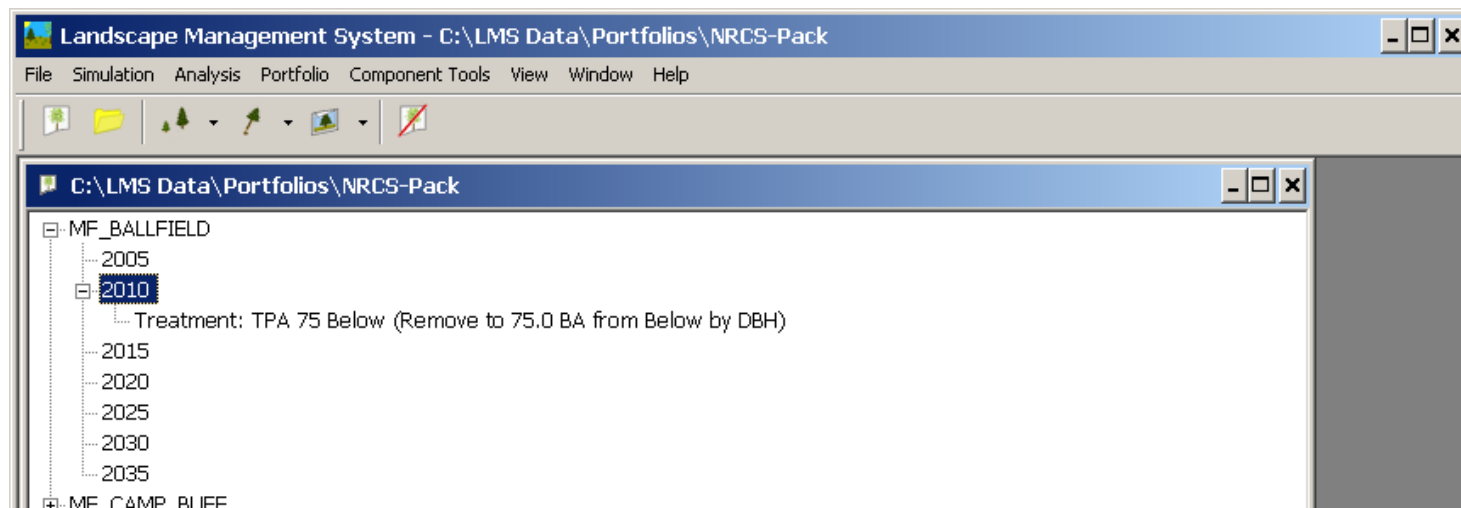


The "Specify a Treatment" dialog box is shown. It has three main sections: "Select Year:", "Select Stand:", and "Select a Treatment(s):".

- Select Year:** A list box containing "2005" and "2010". "2010" is selected.
- Select Stand:** A list box containing "MF_BALLFIELD" with a checked checkbox.
- Select a Treatment(s):** A table with two columns: "Name" and "Description".

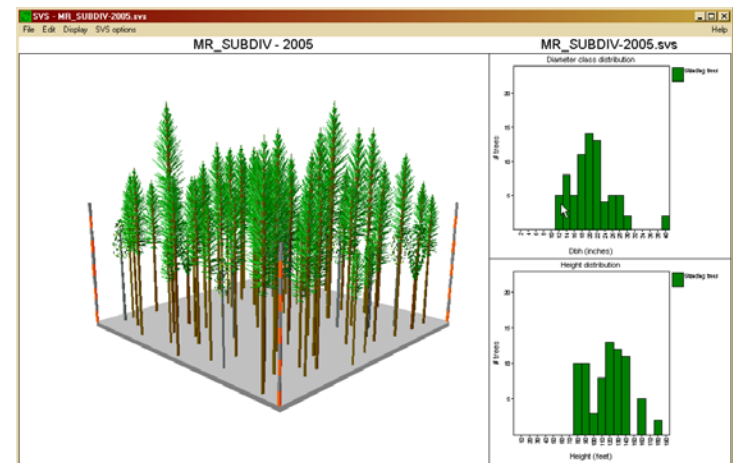
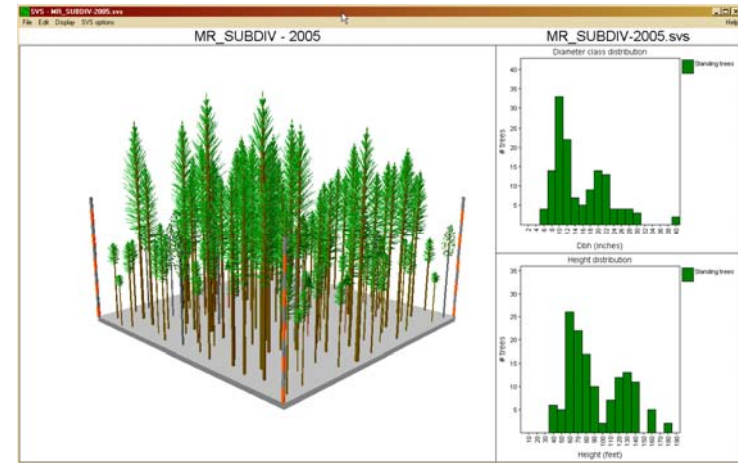
Name	Description
TPA 0 2"-15"	Remove to 0.0 BA from Proportional by DBH, with diameter between 2.0 and 15.0 inches
TPA 75 Below	Remove to 75.0 BA from Below by DBH

At the bottom of the dialog are four buttons: "New", "Edit", "OK", and "Cancel".



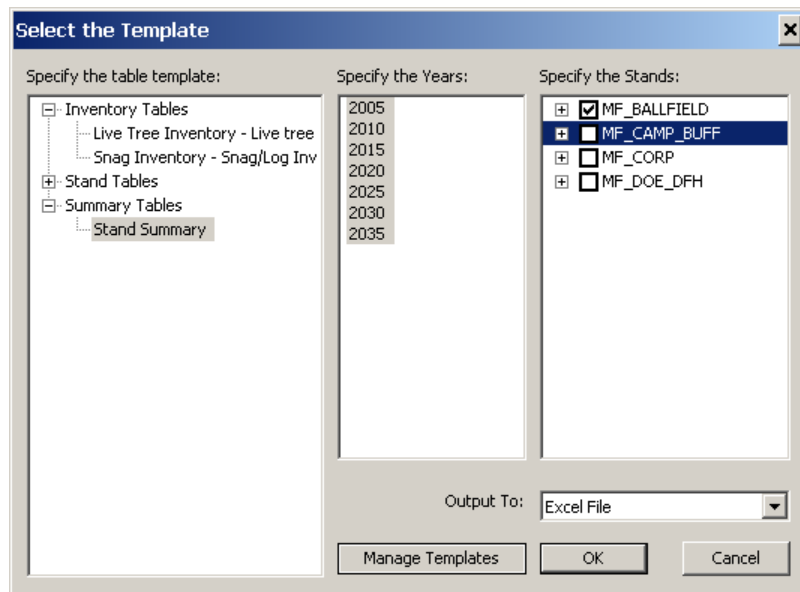
Getting reacquainted with the stand

- SVS images
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 - Stand Summary Total



Changes in QMD

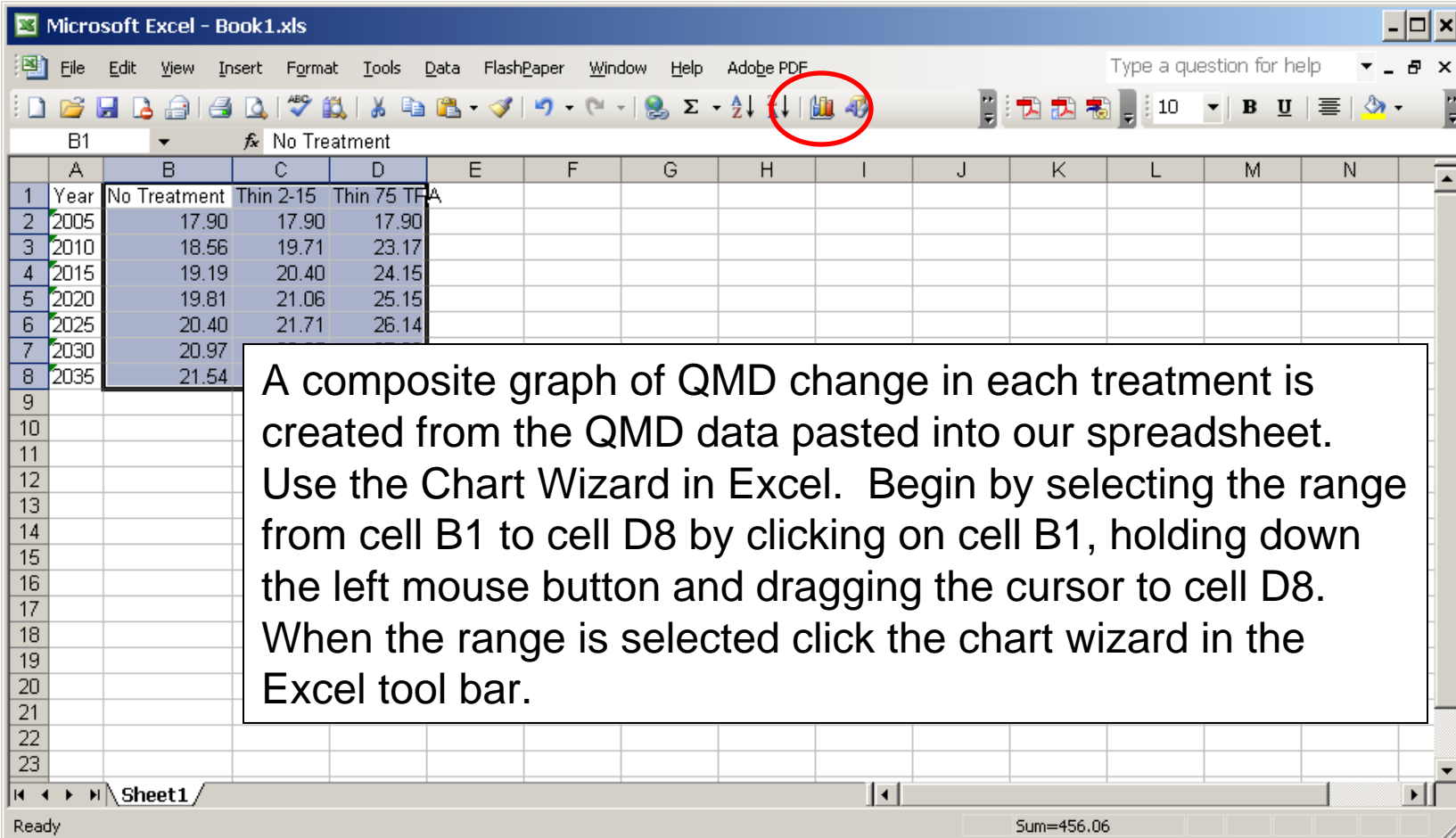
Displaying changes in QMD over the 30-year stand projection will be done using the Stand Summary table template and Excel. First, create a summary table, then copy the Quadratic Mean Diameter column (D) to the spreadsheet we created previously.



Year	Stand	Species	DBH - Out	DBH - Me	Height - A	Height - B	Trees per Acre	Basal Area	Relative C	Stand Der	Volume - T	Volume - To	Volume - To
2005	MF_BALLFIELD	MF_BALLFIELD	17.9	17.6	114.21	79.94	127.27	222.63	52.6	324.08	52641	10489.78	10039.74
2010	MF_BALLFIELD	MF_BALLFIELD	23.17	23	133.75	69.36	25.61	74.99	15.58	98.58	20960.82	3869.05	3731.68
2015	MF_BALLFIELD	MF_BALLFIELD	24.15	24.1	137.61	68.51	25.48	81.06	16.49	104.83	23550.72	4278.61	4166.92
2020	MF_BALLFIELD	MF_BALLFIELD	25.15	25.2	141.21	67.55	25.35	87.46	17.44	111.3	25780.29	4702.6	4557.84
2025	MF_BALLFIELD	MF_BALLFIELD	26.14	26.3	144.61	66.59	25.22	94.03	18.39	117.83	28815.86	5145.05	4957.23
2030	MF_BALLFIELD	MF_BALLFIELD	27.08	27.3	147.79	65.74	25.08	100.37	19.28	124.04	32259.65	5603.8	5426.23
2035	MF_BALLFIELD	MF_BALLFIELD	28	28.3	150.81	64.93	24.94	106.73	20.16	130.16	35658.33	6054.9	5912.85

Year	No Treatment	Thin 2-15	Thin 75 TPA
2005	No Treatment	17.90	17.90
2010	No Treatment	18.56	19.71
2015	No Treatment	19.19	20.40
2020	No Treatment	19.81	21.06
2025	No Treatment	20.40	21.71
2030	No Treatment	20.97	22.35
2035	No Treatment	21.54	22.97

Creating Composite QMD Change Graph



The screenshot shows the Microsoft Excel interface with a spreadsheet titled "Book1.xls". The spreadsheet has columns A through N and rows 1 through 23. The data is organized as follows:

Year	No Treatment	Thin 2-15	Thin 75 TFA
2005	17.90	17.90	17.90
2010	18.56	19.71	23.17
2015	19.19	20.40	24.15
2020	19.81	21.06	25.15
2025	20.40	21.71	26.14
2030	20.97		
2035	21.54		

A text box is overlaid on the spreadsheet, providing instructions on how to create a composite graph of QMD change in each treatment. The text box contains the following text:

A composite graph of QMD change in each treatment is created from the QMD data pasted into our spreadsheet. Use the Chart Wizard in Excel. Begin by selecting the range from cell B1 to cell D8 by clicking on cell B1, holding down the left mouse button and dragging the cursor to cell D8. When the range is selected click the chart wizard in the Excel tool bar.

The Excel interface also shows the "Chart Wizard" icon in the toolbar, which is circled in red. The status bar at the bottom indicates "Ready" and "Sum=456.06".

Chart Wizard – Step 1

Excel's Chart Wizard is a 4-step, interactive tool that guides the user through creating charts. In Step 1 the type of chart is selected. Select "Line" under chart type then click "Next".

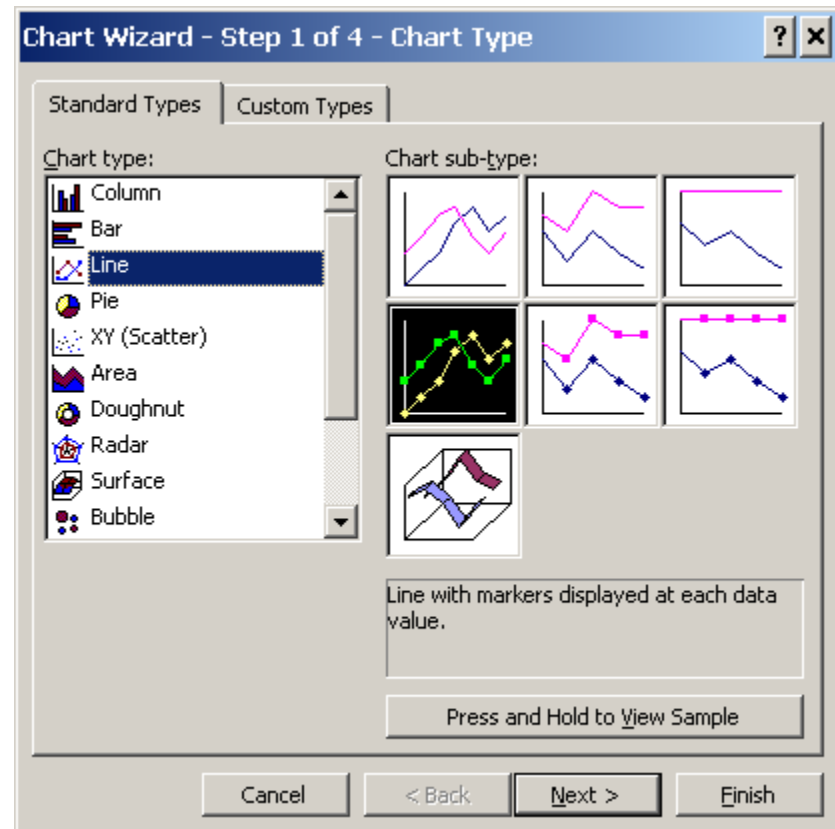


Chart Wizard – Step 2

Chart Wizard - Step 2 of 4 - Chart Source Data

Data Range Series

30.00
25.00
20.00
15.00
10.00
5.00
0.00

1 2 3 4 5 6 7

Series

No Treatment
Thin 2-15
Thin 75 TPA

Name: =Sheet1!\$B\$1

Values: =Sheet1!\$B\$2:\$B\$8

Add Remove

Category (X) axis labels:

Cancel < Back Next > Finish

Step 2 of the Chart Wizard lets the user change the location of the source data for the chart and set the x-axis labels. Clicking the “Series” tab allows the user to change the names of the data series that are being plotted and add values for the x-axis. Click the button to the right of the “Category (X) Axis Labels” box (left) to go back to the summary table and highlight the years in column A (below). After the year range has been selected, click the icon on the dialog to return to the Chart Wizard.

Microsoft Excel - Book1.xls

File Edit View Insert Format Tools Data FlashPaper Window Help Adobe PDF

Type a question for help

A2 No Treatment

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Year	No Treatment	Thin 2-15	Thin 75 TPA										
2	2005	17.90	17.90	17.90										
3	2010	18.56	19.71	23.17										
4	2015	19.19	20.40	24.15										
5	2020	19.81	21.06	25.15										
6	2025	20.40	21.71	26.14										
7	2030	20.97	22.35	27.08										
8	2035	21.54	22.97	28.00										
9														
10														
11														
12														

Chart Wizard - Step 2 of 4 - Chart Source Data - Categ... ? X

=Sheet1!\$A\$2:\$A\$8

Chart Wizard – Step 3

Step 3 of the Chart Wizard is where chart options, such as title, axis labels, and legends are specified. Under the Titles tab enter “QMD Change” in the Chart Title box, “Year” in the Category (X) axis box, and “QMD (inches)” in the Value (Y) axis box. These values will automatically be added to the chart. Under the Legend tab check the “Top” radio button under “Placement” to place the legend above the chart. Click Next to go to Step 4.

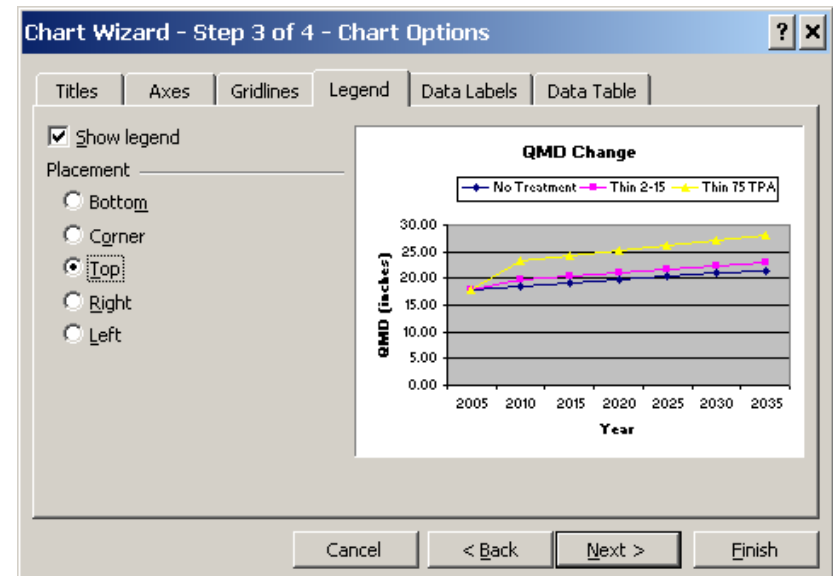
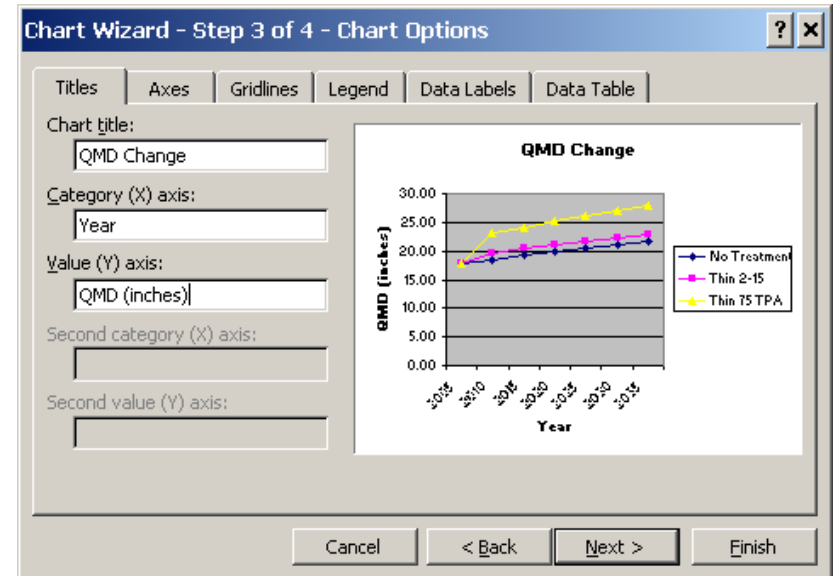
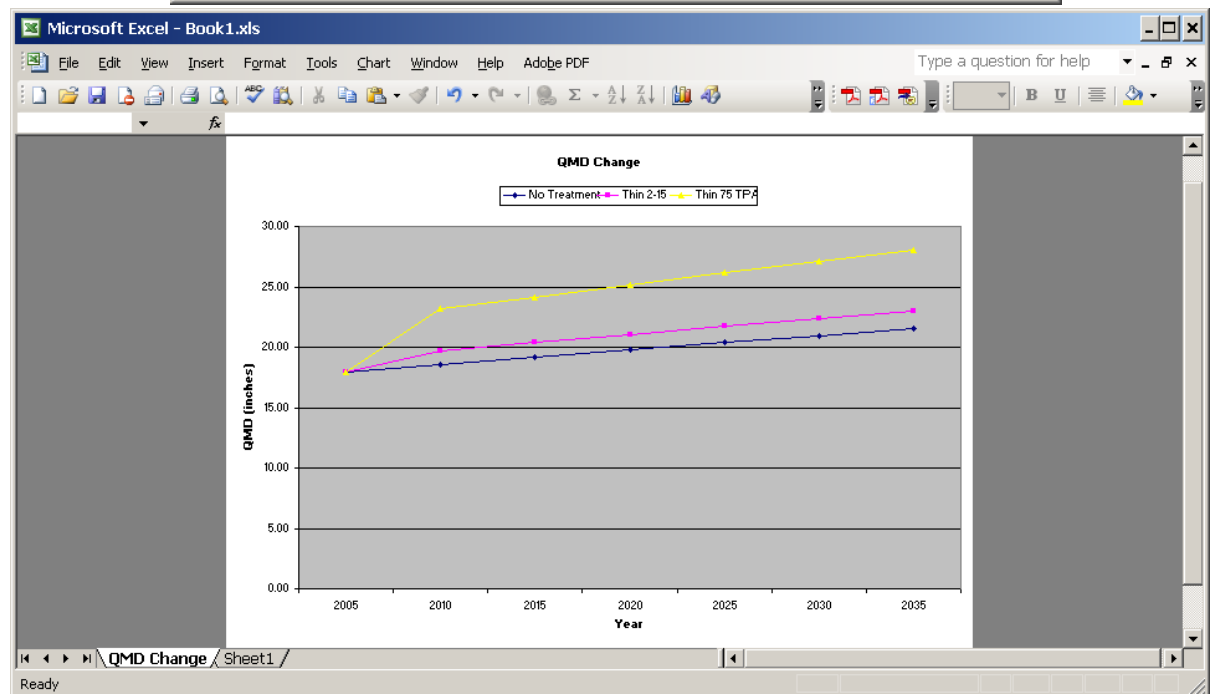
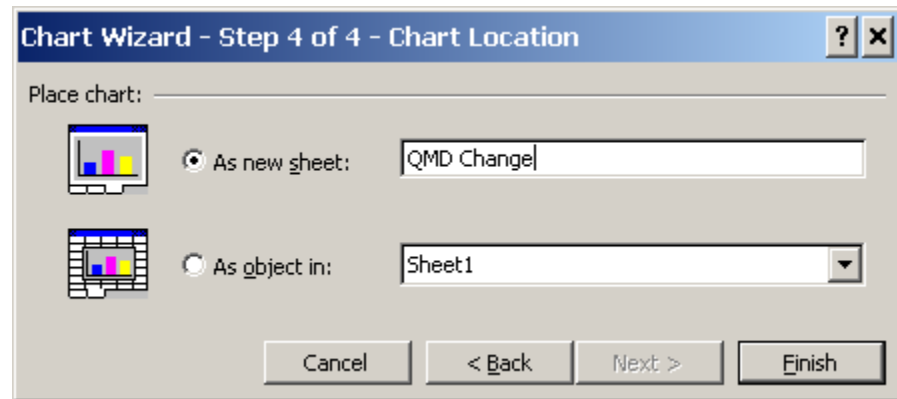
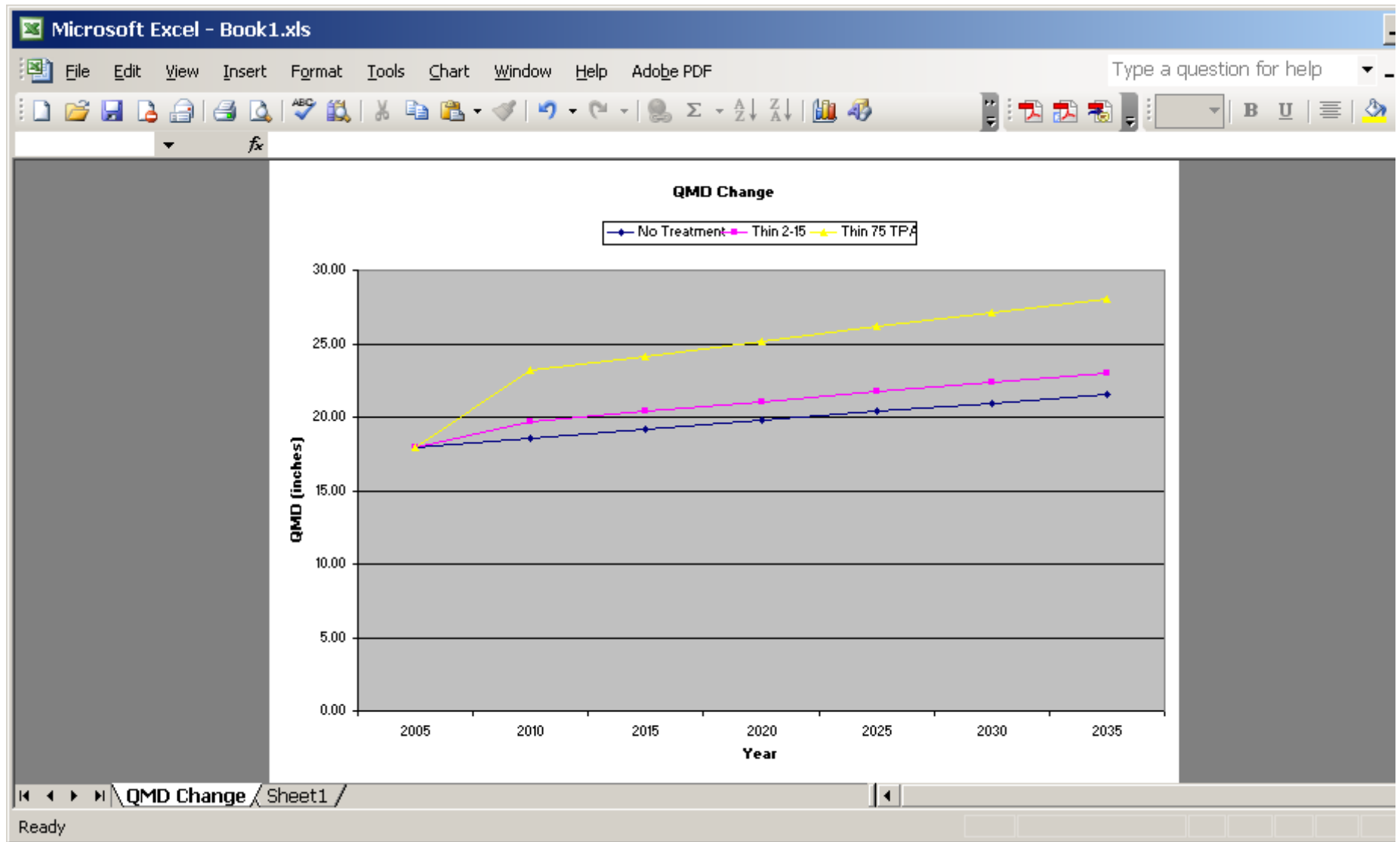


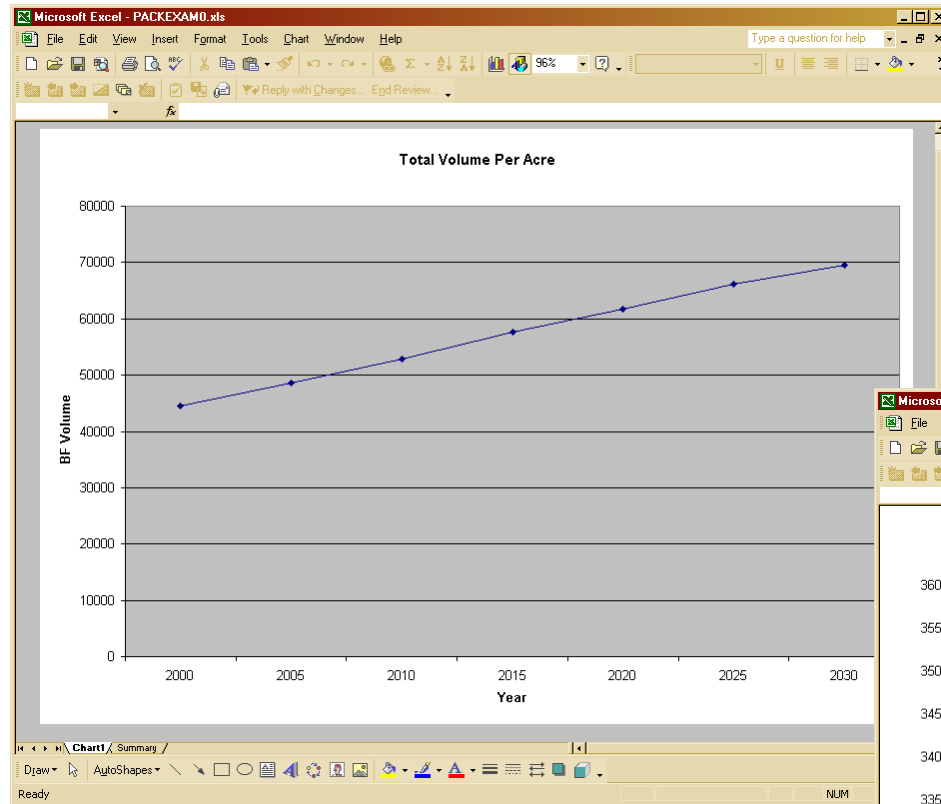
Chart Wizard – Step 4

Step 4 of the Chart Wizard lets the user select where the chart will be placed, either in a new worksheet or as an object in an existing worksheet (top). Select “As new sheet” and change the name to “QMD Change”. Click Finish to complete the chart. A new worksheet titled “QMD Change” will be added to the workbook with the QMD Change chart (bottom).

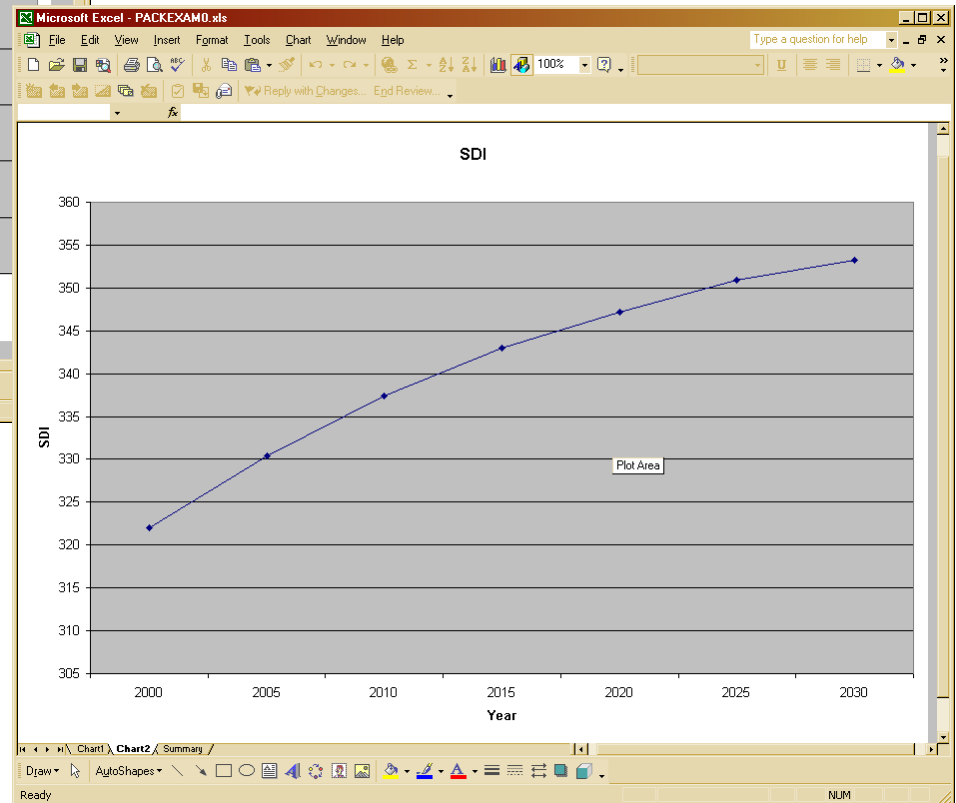




Other Charts from Summary Table



Other charts can be made from the summary table. For example, Total Volume Per Acre and SDI are created by selecting the TVolPerAcre or SDI column rather than the QMD column.



Exercise

- Using the same stand as the previous exercise, perform treatments in the year 2000 with the objectives of creating older forest habitat and harvest volume.
- Grow for 30 years
- View SVS images to examine stand changes caused by treatment and growth
- Create QMD graph for No Treatment and each of the treatments.

Growth and Treatment Summary

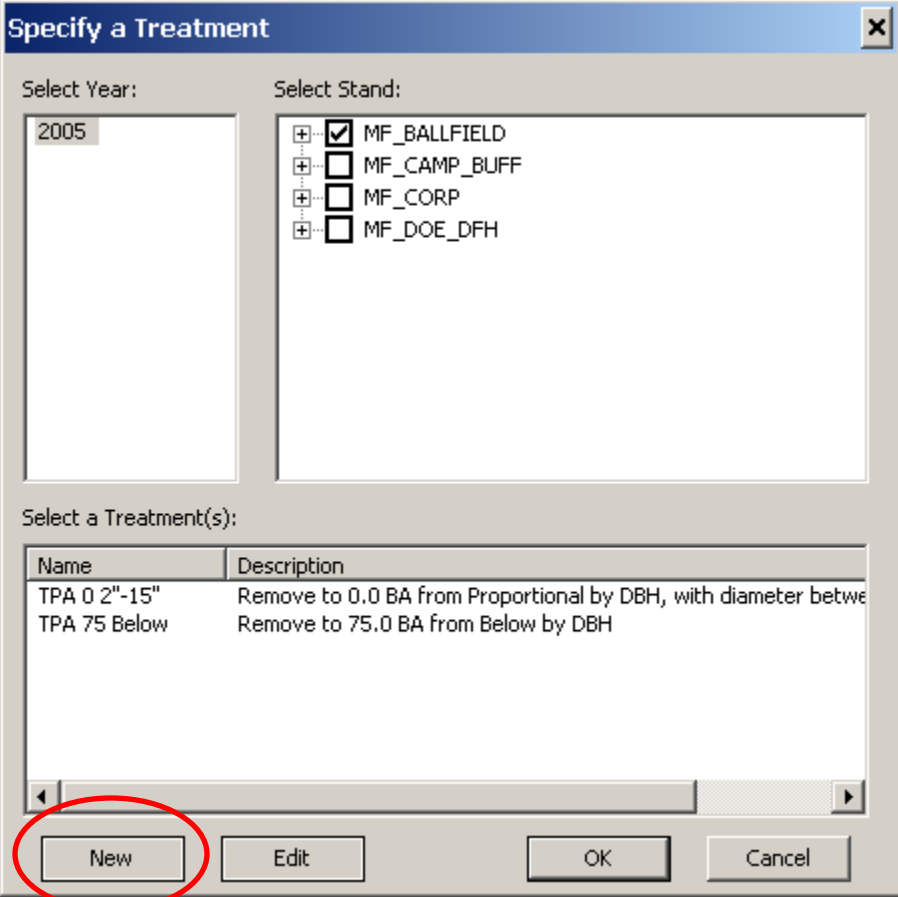
Regenerating Stands and Treatment Effects

Learn how to regenerate stands
using LMS and examine the
results using LMS

Regenerating Stands

Regenerating stands with LMS is done using the same treatment specification dialog as for a thinning.

Click NEW to create a new treatment...



The dialog box titled "Specify a Treatment" contains three main sections. The "Select Year:" section has a text box with "2005". The "Select Stand:" section is a list box with four items: "MF_BALLFIELD" (checked), "MF_CAMP_BUFF", "MF_CORP", and "MF_DOE_DFH". The "Select a Treatment(s):" section is a table with two columns: "Name" and "Description". The table contains two rows: "TPA 0 2\"-15\"" with description "Remove to 0.0 BA from Proportional by DBH, with diameter betwe" and "TPA 75 Below" with description "Remove to 75.0 BA from Below by DBH". At the bottom, there are four buttons: "New", "Edit", "OK", and "Cancel". The "New" button is circled in red.

Name	Description
TPA 0 2"-15"	Remove to 0.0 BA from Proportional by DBH, with diameter betwe
TPA 75 Below	Remove to 75.0 BA from Below by DBH

Regenerating Stands

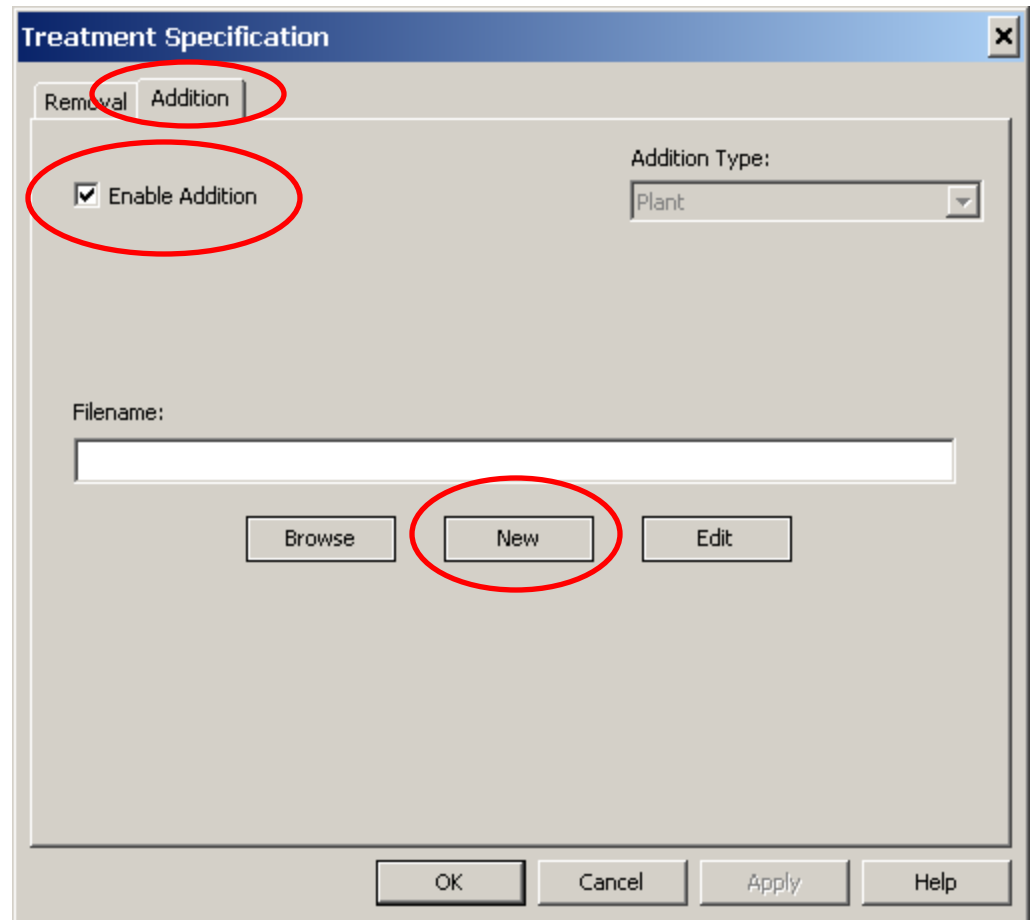
From the Treatment Specification dialog select the Addition tab to specify regeneration information.

Check Enable Addition to indicate that you want inventory records added as part of this treatment.

Click the New button to create a new regeneration file.

Click Browse to select an existing regeneration file.

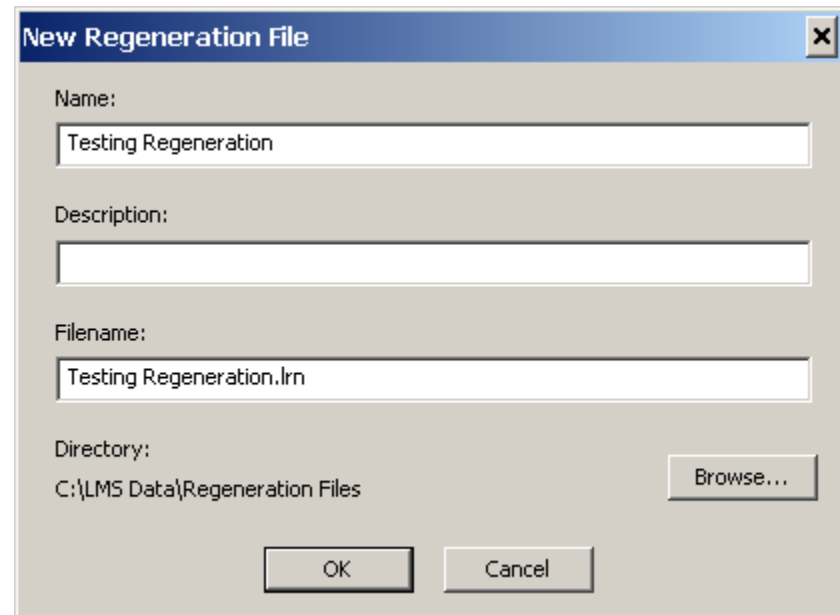
Click Edit to modify a currently selected regeneration file.



The screenshot shows the 'Treatment Specification' dialog box. The 'Addition' tab is selected and highlighted with a red circle. Below the tabs, the 'Enable Addition' checkbox is checked and circled in red. To the right, the 'Addition Type' dropdown menu is set to 'Plant'. Below this is a 'Filename:' label and an empty text input field. At the bottom of the dialog, there are three buttons: 'Browse', 'New' (circled in red), and 'Edit'. At the very bottom of the window are standard control buttons: 'OK', 'Cancel', 'Apply', and 'Help'.

Regenerating Stands

The New Regeneration File dialog allows you to enter a name and description for the regeneration files. The filename will be automatically created.



The image shows a Windows-style dialog box titled "New Regeneration File". It contains four input fields: "Name:" with the text "Testing Regeneration", "Description:" which is empty, "Filename:" with the text "Testing Regeneration.lrn", and "Directory:" with the text "C:\LMS Data\Regeneration Files". To the right of the "Directory:" field is a "Browse..." button. At the bottom of the dialog are "OK" and "Cancel" buttons.

New Regeneration File	
Name:	Testing Regeneration
Description:	
Filename:	Testing Regeneration.lrn
Directory:	C:\LMS Data\Regeneration Files
<input type="button" value="Browse..."/>	
<input type="button" value="OK"/>	<input type="button" value="Cancel"/>

Regenerating Stands

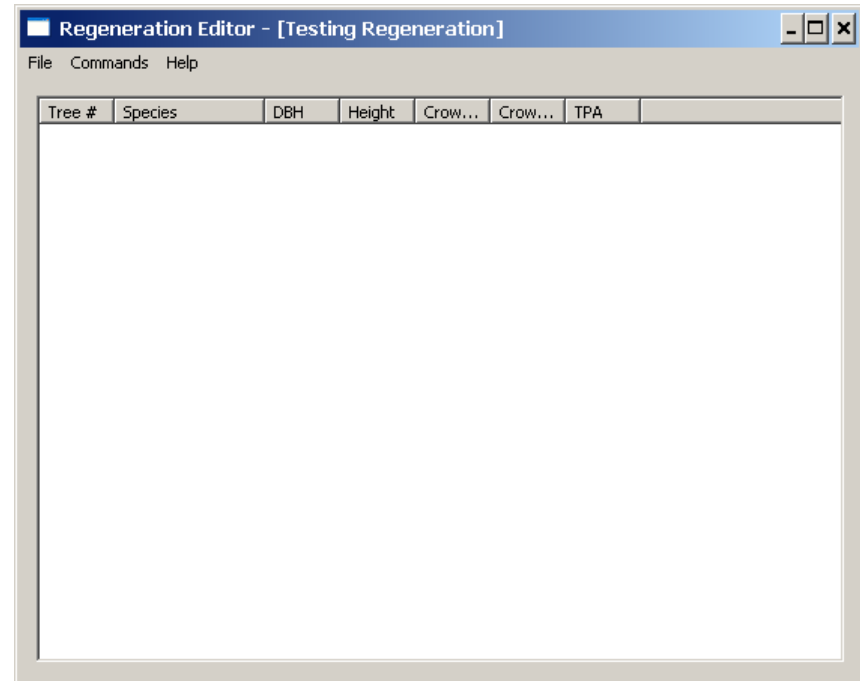
From the Regeneration Editor you can manage individual inventory records in the regeneration file.

Use Commands/Add to add new inventory records to the file.

Use Commands/Modify to edit and existing record.

Use Commands/Expand Records to spread an inventory records to several records.

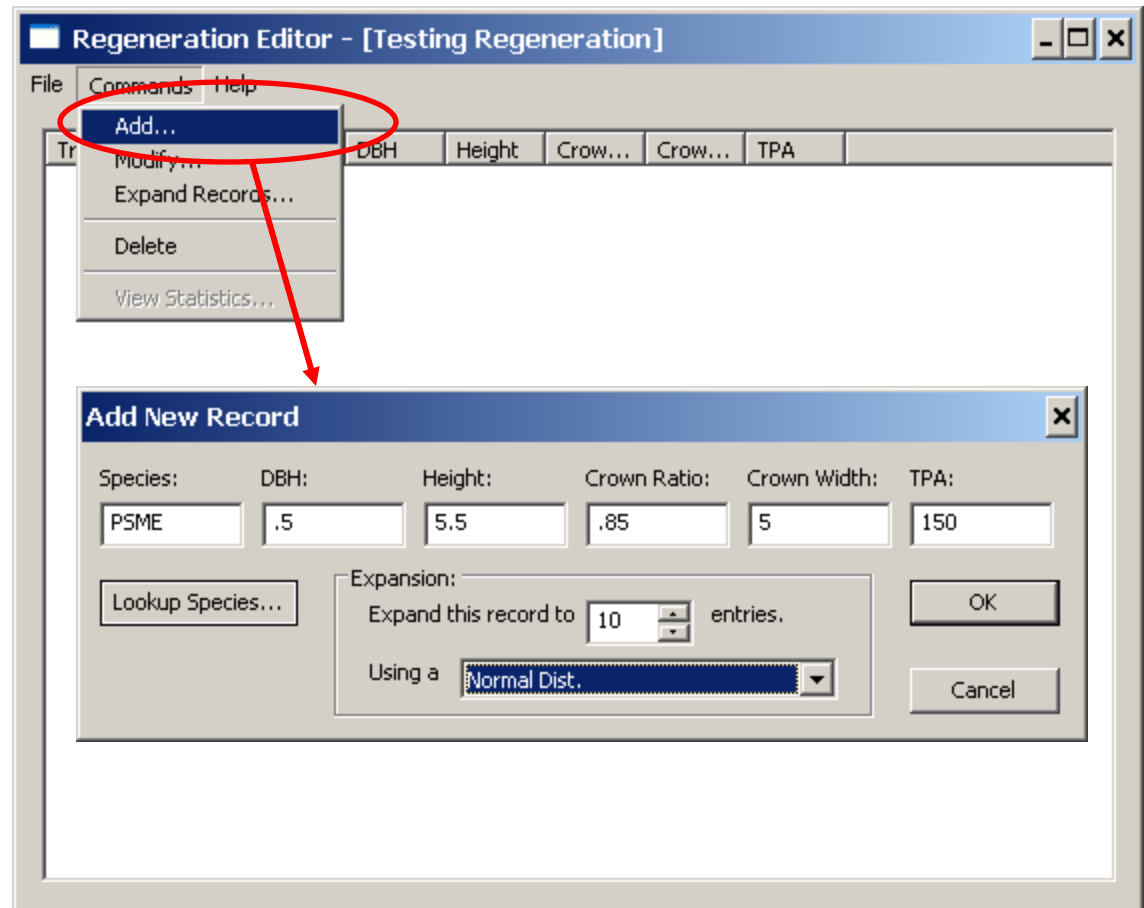
Use Commands/Delete to remove a record.



Regenerating Stands

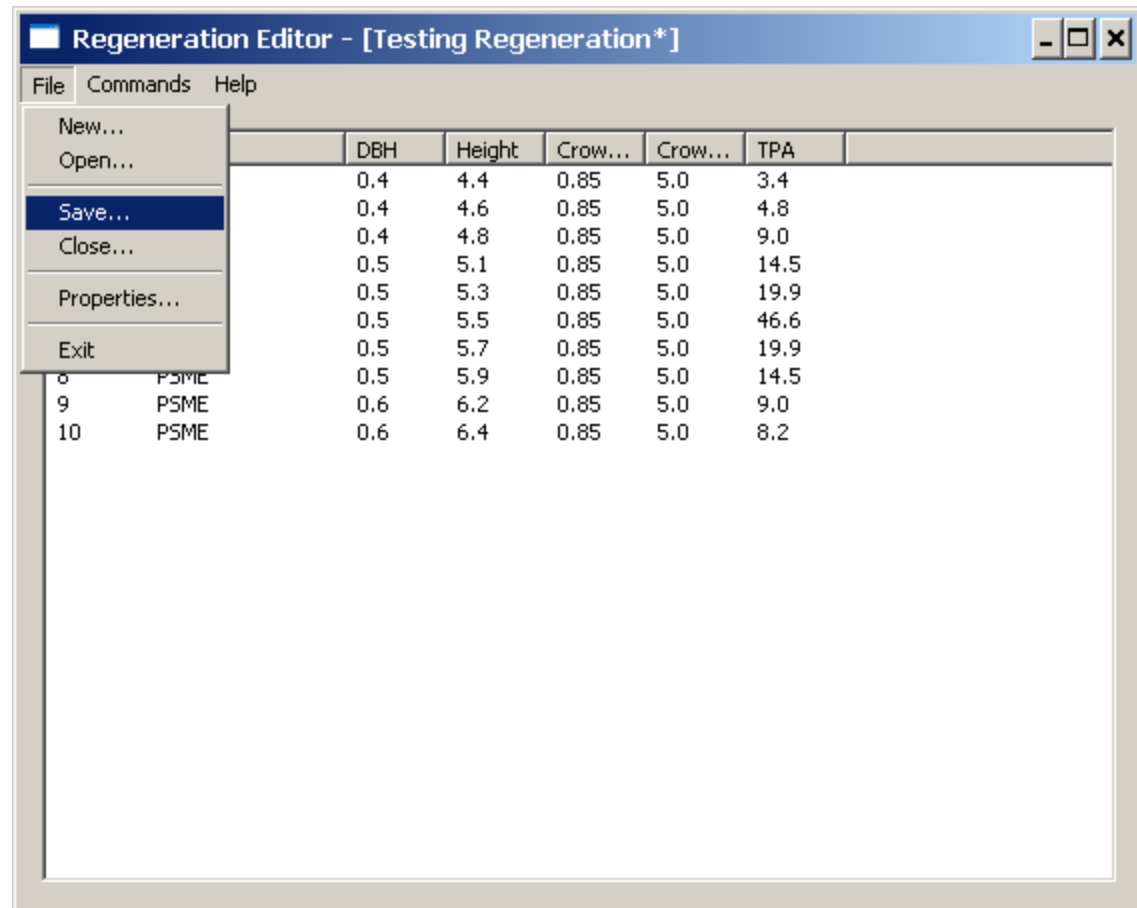
The Add New Record dialog allows you to specify the species, diameter, height, crown ration, crown width, and TPA for the record. You can have any record expanded to the desired number or records.

When expanding records you can use a normal distribution or no distribution.



Regenerating Stands

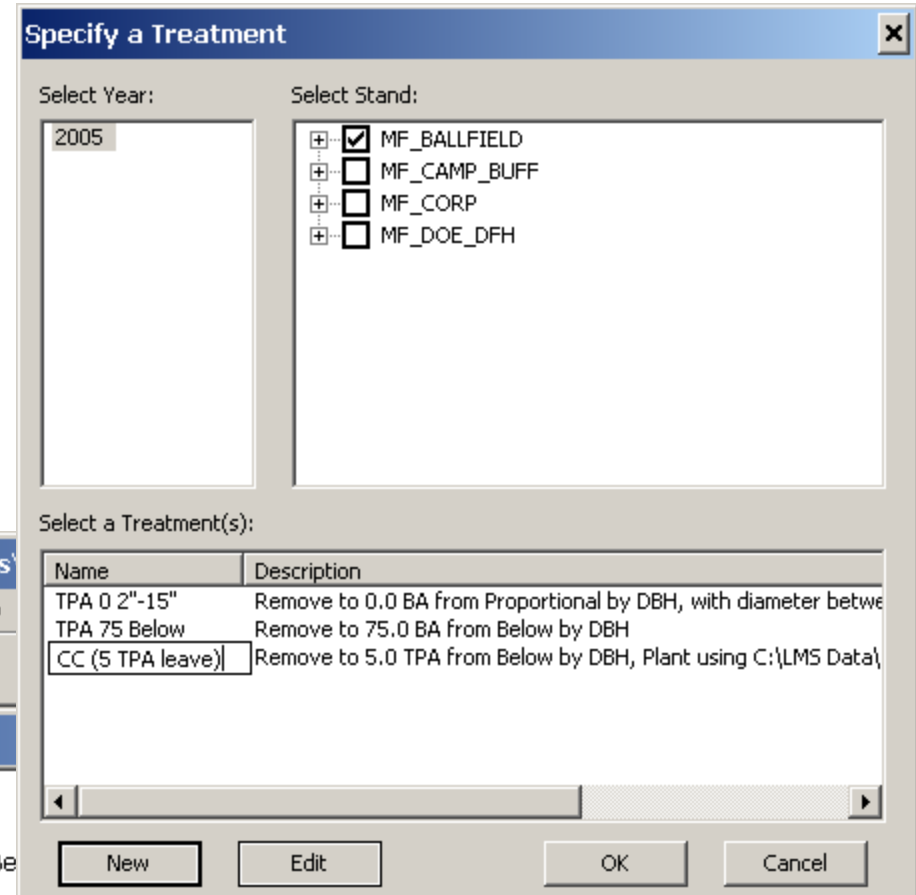
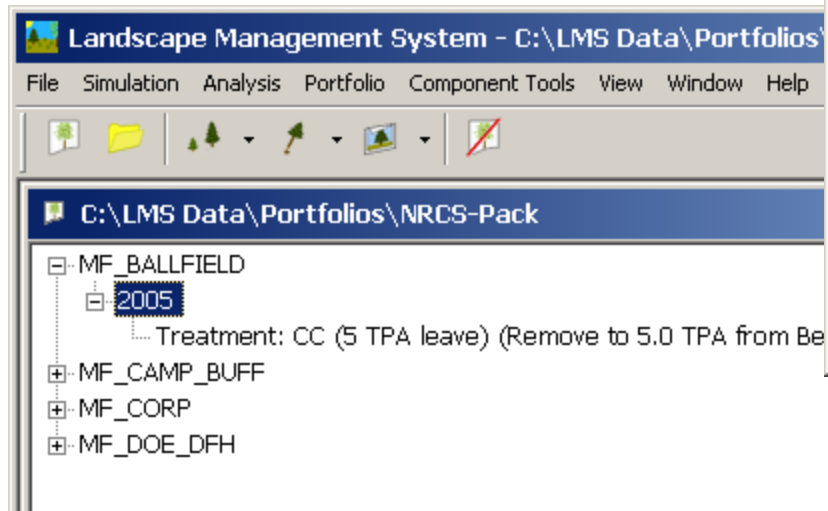
When done editing save the file using the File/Save command.



Regenerating Stands

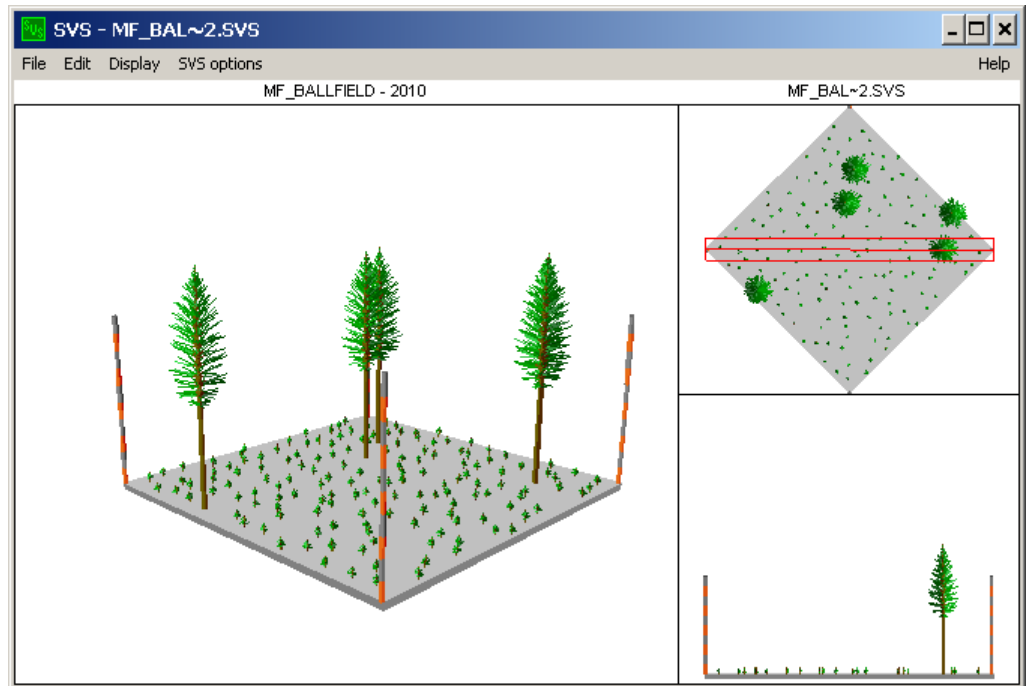
Regeneration files are typically used in combination with other treatments to simulate regeneration harvests.

Separate planting treatments can be used to regenerate stands.



Regenerating Stands

The regeneration records are introduced into the inventory after the stand is grown one cycle. The SVS image to the right shows what the stand might look like five years after a regeneration harvest that left 5 TPA and regenerated with 150 TPA of PSME.



Regenerating Stands Summary