Projecting Stands

LMS simulates tree growth through the use of growth models. Two growth models, the Forest Vegetation Simulator (FVS) and Organon, are presently available for use within LMS. FVS has 21 regional variants that can be used to model forest growth for most American forest types and species. Organon has three variants that can be used to model forest types in the Pacific Northwest. For teaching purposes, the Pacific Northwest Variant of the Forest Vegetation System or **FVS, PN** is used for the selected growth model. This growth model was developed by the USDA Forest Service for use in western Oregon and Washington.
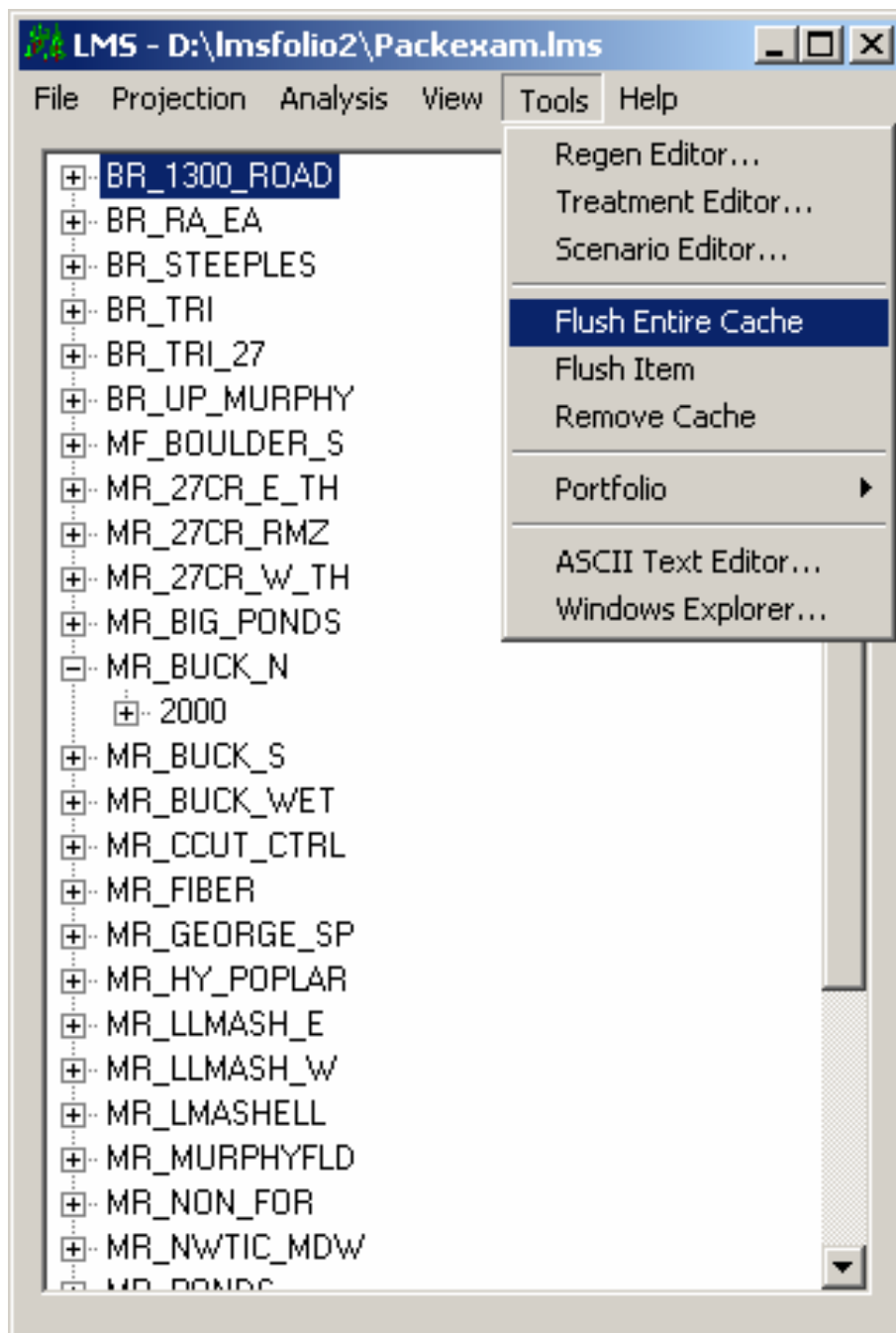
Figure 6.1 Before making new stand projections the user should flush the cache. Flushing the cache eliminates stored information from previous projections. Click **Tools** and then click **Flush Entire Cache**.
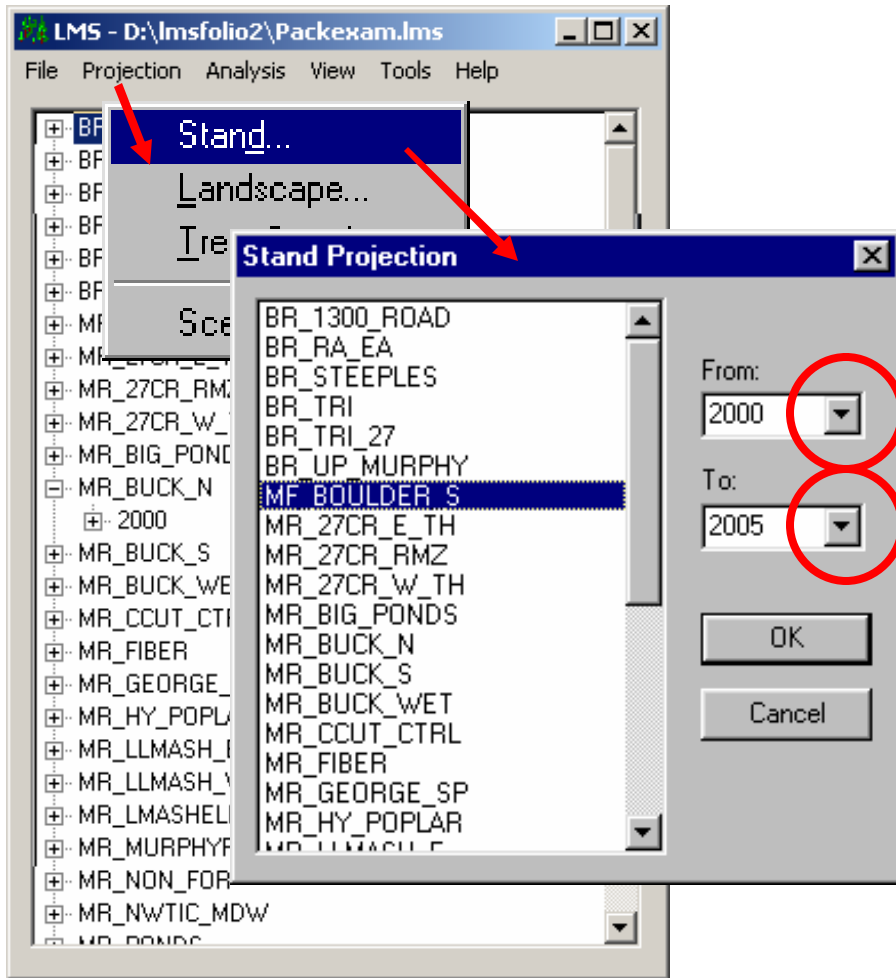
Figure 6.2 To project a stand click **Projection** and then click **Stand**. The stand projection dialogue window will open. **Select the stand** that is intended for projection. Next **select the period** of intended projection. The default will automatically select to project the stand for one growth increment beyond the last projection. The user may choose a longer projection period by toggling up the year seen here enclosed by the lower red circle. The step size in this case is 5 years. The step size is set in the Portfolio Wizard during portfolio creation (see Creating a New Portfolio with LMS 2.0) or in the Portfolio Configuration window discussed later in this section. When selections are complete click **OK**.
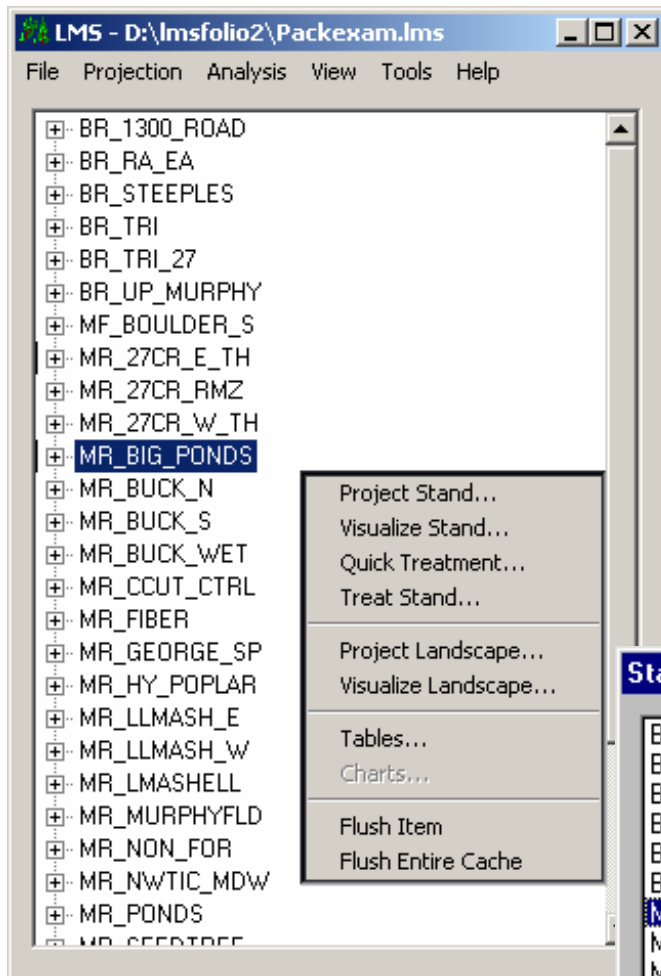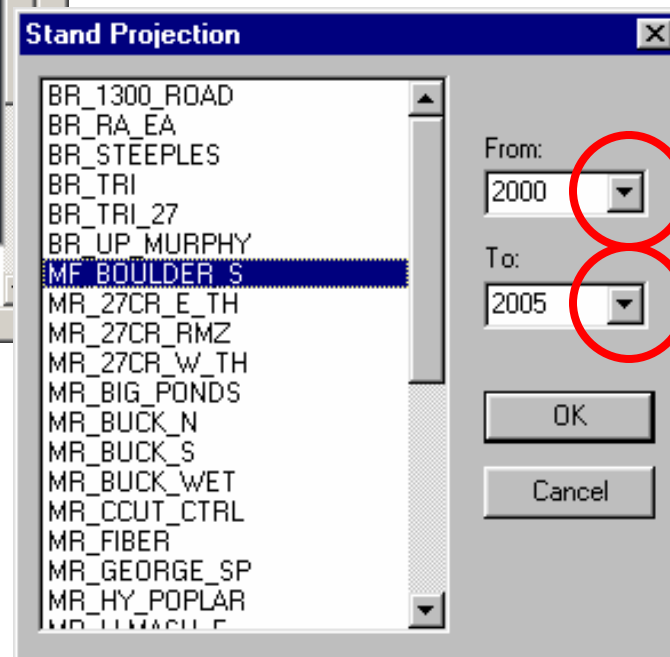
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Figure 6.3. Stand projection may also be accomplished by a **right click in the main window** to open a command dialogue. Left click **Project Stand** and the Stand Projection dialogue window will open. Choose the desired stand and the projection period. Click OK and the stand projection has been initiated.
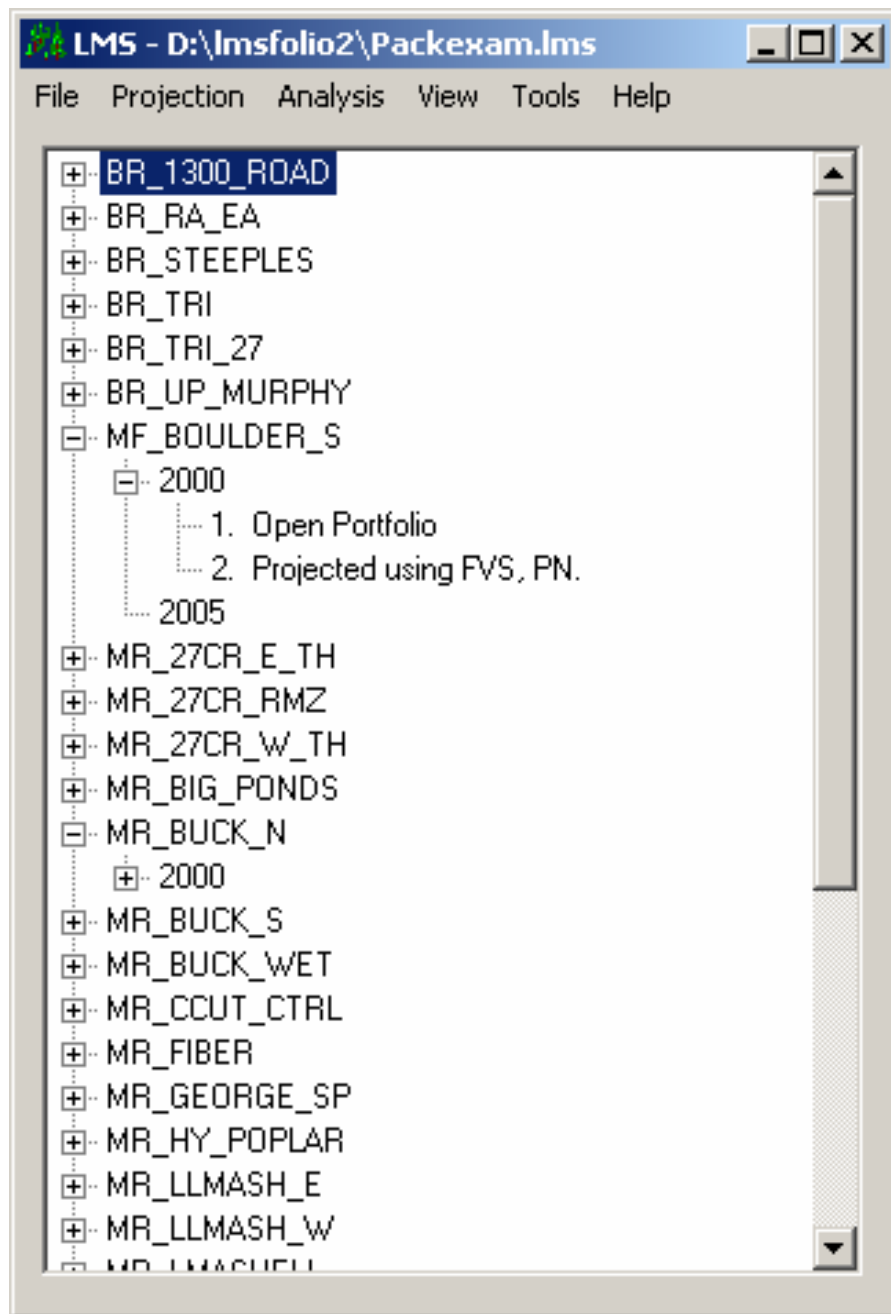
4

Figure 6.4. Once the projection has been completed the **Main Window** will again appear. By clicking the **small box** beside the stand that was chosen for projection and then by clicking the **small box** beside the start year, the user enables the Main Window to display a record or **log** of the stand projection. To hide the log simply reverse the process.

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Figure 6.5. Note if the user chooses a longer growth period for Stand Projection the log would record successive step intervals as below.
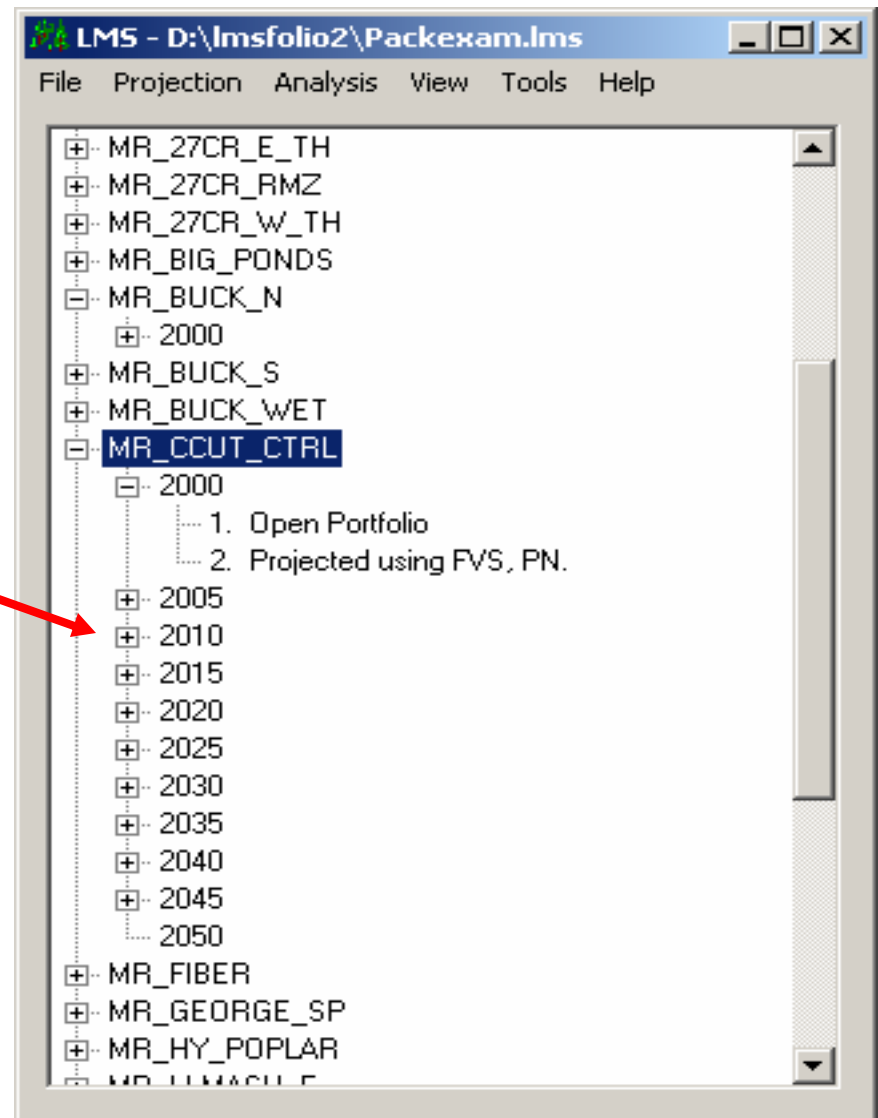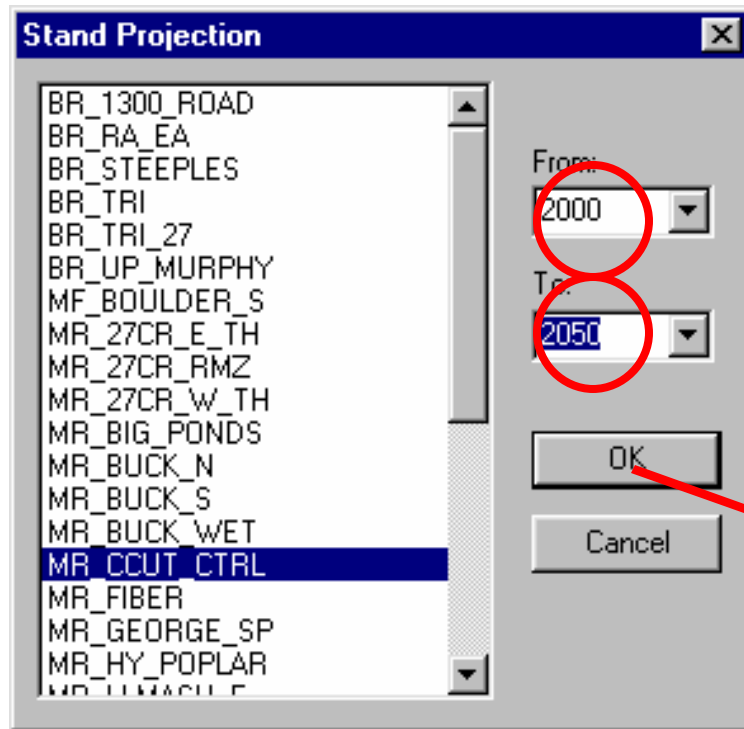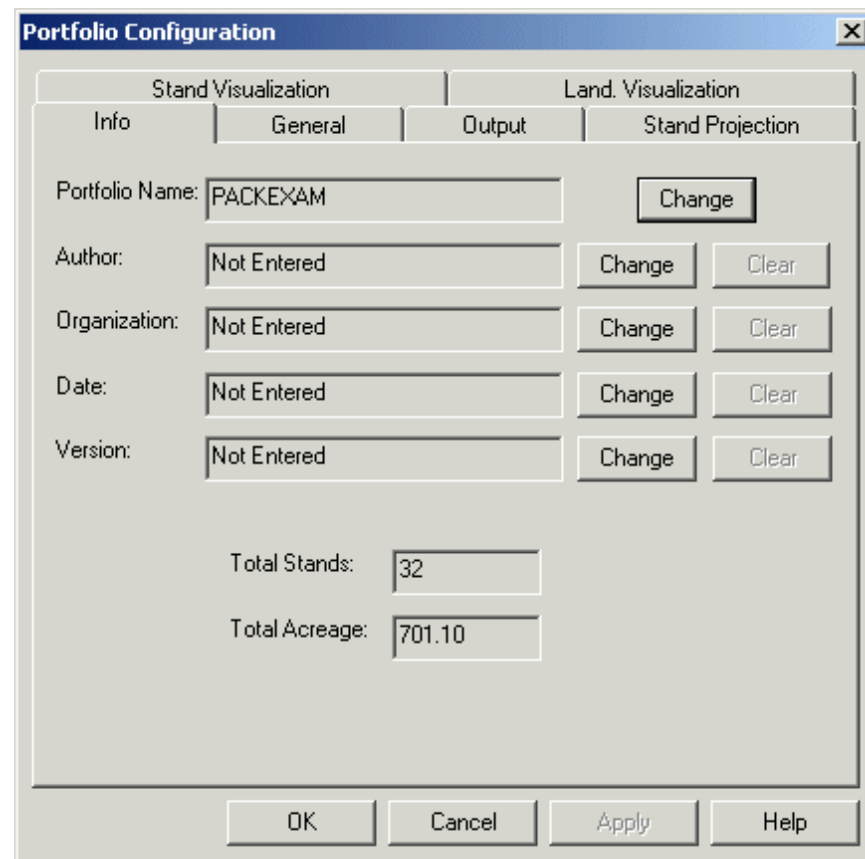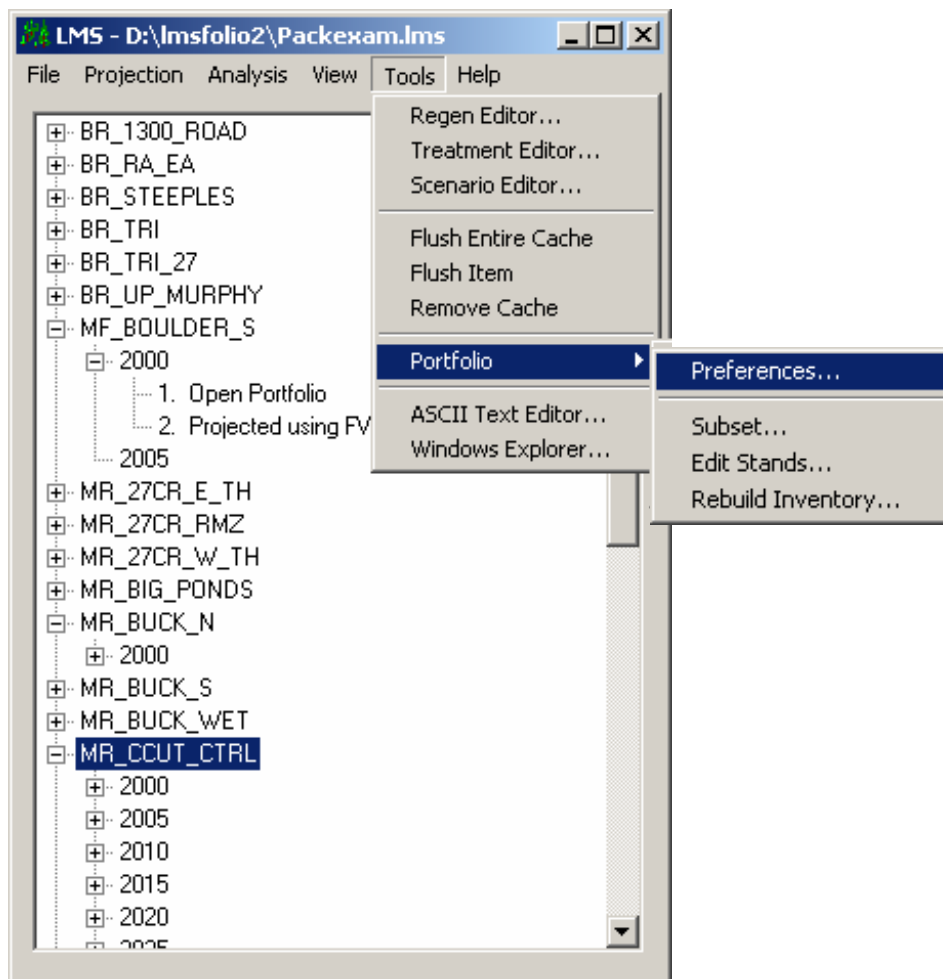
Figure 6.6. By clicking **Tools**, then **Portfolio**, and then **Preferences** the user accesses the **Portfolio Configuration** Dialog. This dialog consists of series of tabs organized for similar options.

Figure 6.7. Within the **Portfolio Configuration Dialog** the user may choose to reset the **step size**, reset the **Initial Year**, or view **general portfolio parameters** on the General page. Step size, the growth interval for model projections, must be set for either 5 or 10 years when using FVS but **5 years only when using Organon**.
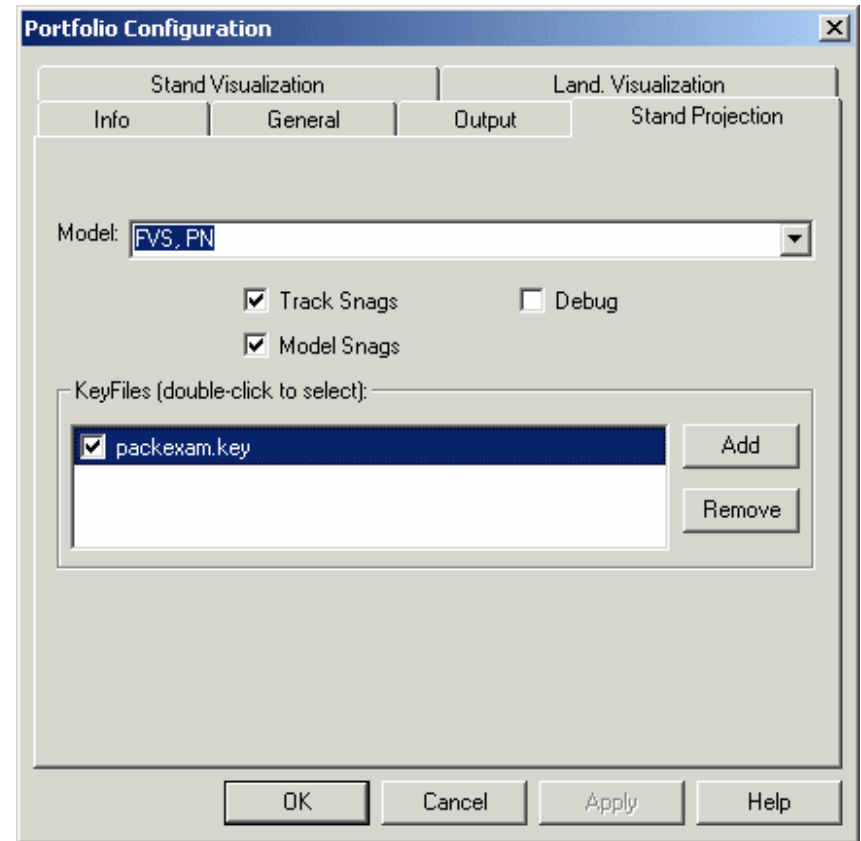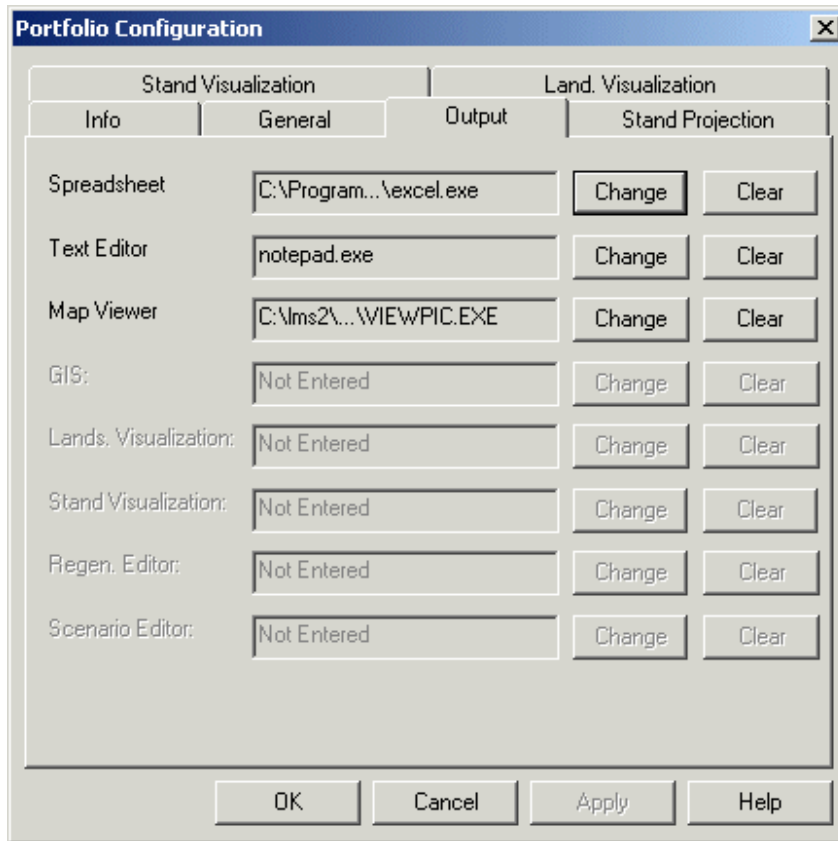
Figure 6.8. The Output tab allows the user to change the programs used for display by LMS. On the **Stand Projection** page the user may choose a different **growth model** from the model drop down, enable **snag programs**, or enable a **key file**. Snag, debug, and global keyfile functions will be discussed later.
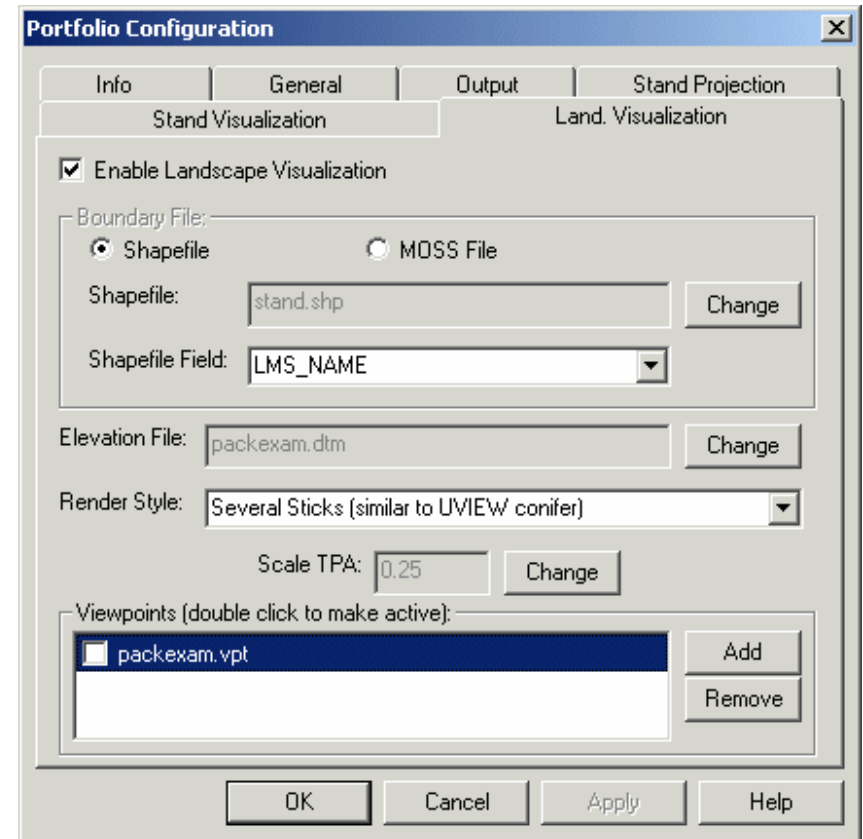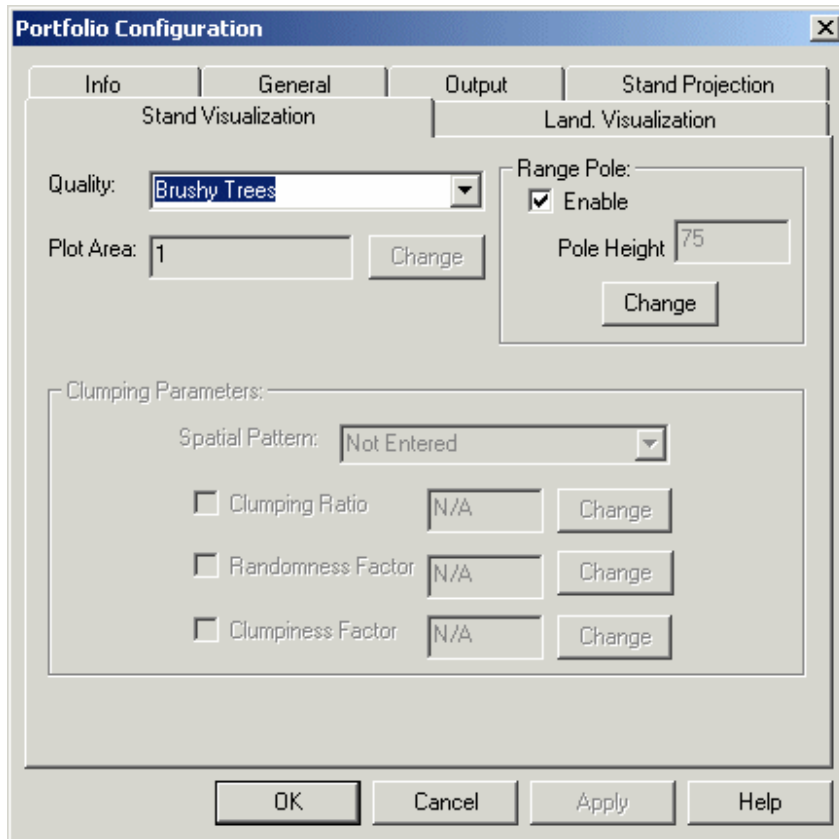
Figure 6.9. The stand visualization tab allows the user to change options relating to stand level visualization. The landscape visualization tab allows the user to modify the parameters used for landscape visualization.
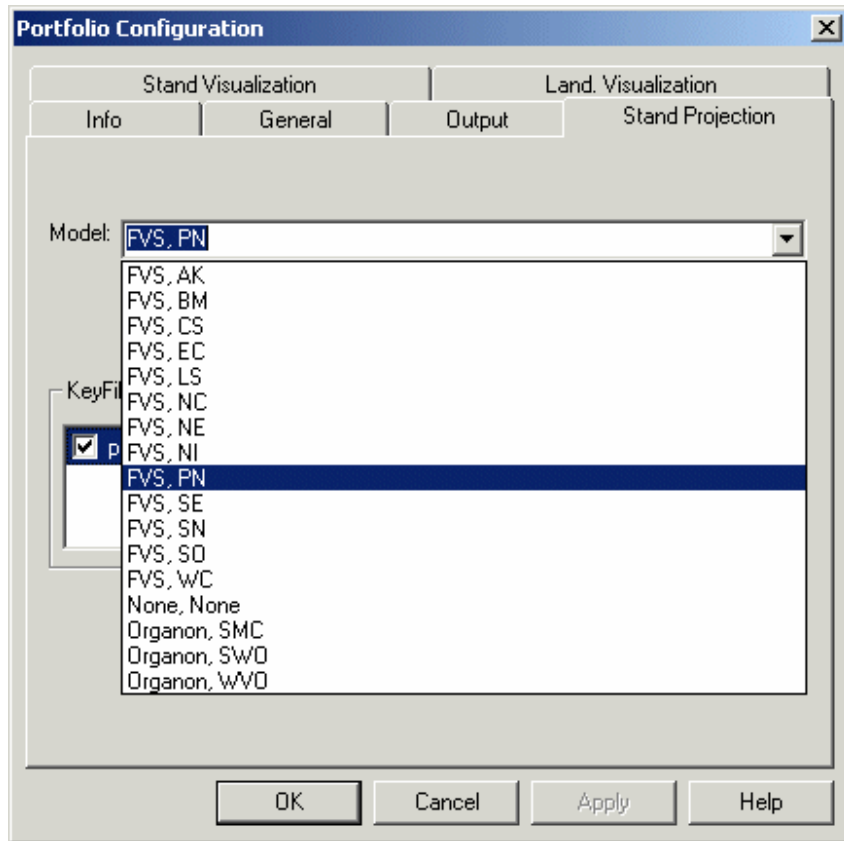
Figure 6.8. Note: for teaching purposes the Pacific Northwest Variant of the Forest Vegetation System or **FVS, PN** is used for the selected growth model. This growth model was developed by the USDA Forest Service for use in western Oregon and Washington. FVS has available variants for most U. S. forest types. LMS has the ability to accept many growth model choices and regional variants. Different models may be selected for use by clicking the model of choice on the stand projection page of the portfolio configuration window.

Key files are used to adjust the growth rates within the models the to reflect local conditions more accurately. More information on key files can also be found at the LMS web site.
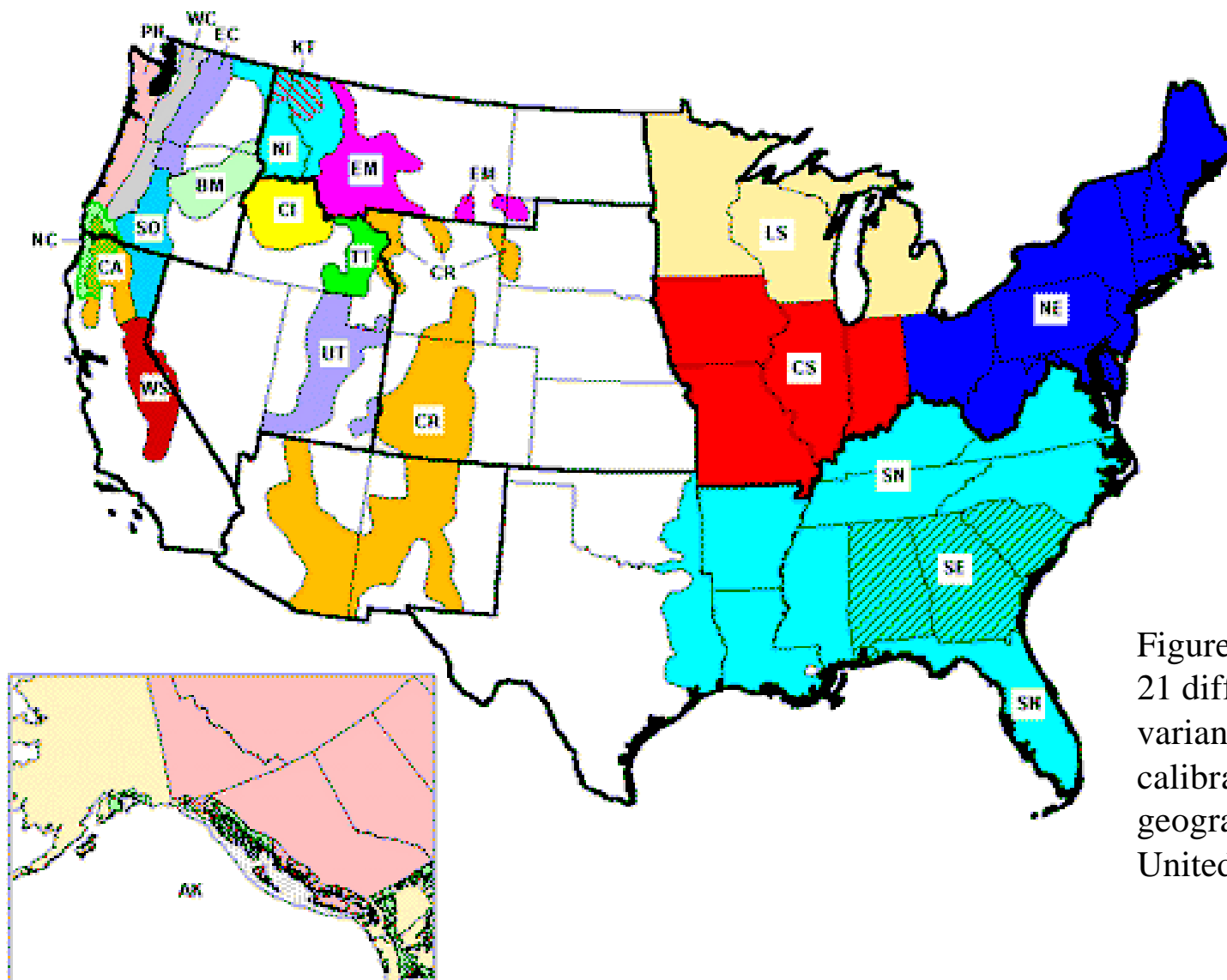
Figure 6.9. There are 21 different FVS variants. Each is calibrated to a specific geographic area of the United States.
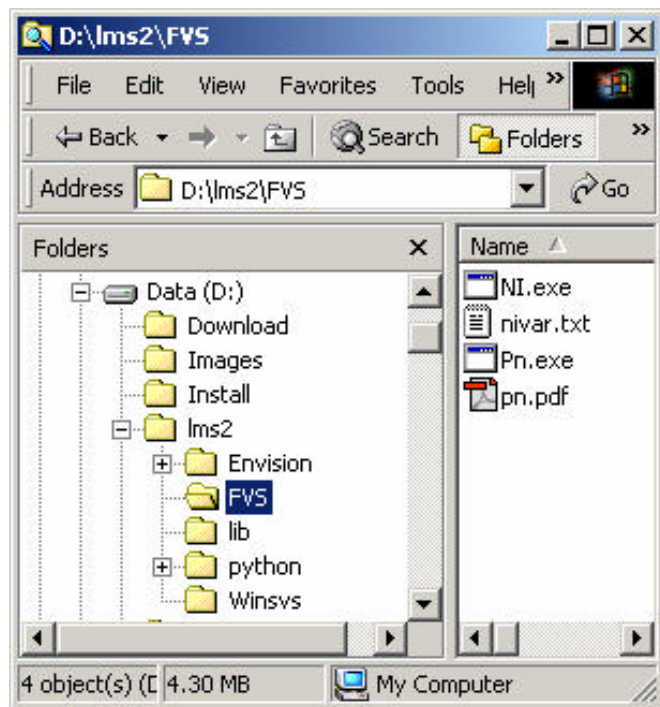
Figure 6.10. LMS2 is currently distributed with the Pacific Northwest Coast variant of FVS (PN). The other variants can be used by putting a copy of the executable in the LMS2\FVS directory. You can download additional variants of FVS from http://www.fs.fed.us/fmsc/fvs/fvs_varfiles.htm . Download the appropriate file for the variant you want (eg. sedos.exe for the Southeast variant). The file downloaded from the FVS site is a self-extracting executable. To install the actual program file you need to extract the compressed executable from this file. This can be done by double-clicking the file (sedos.exe for example). You will then be able to enter the directory where you want the file located (C:\lms2\fvs would be the location for a default install of LMS2) or if you have WinZip you can click the Run WinZip button to load WinZip. Click the Extract button, browse for the correct directory, click the extract button, and then close WinZip when finished. To use the new FVS variant load LMS2, open a portfolio, and use Tools|Portfolio|Preferences... to modify the portfolio. Select the Stand Projection tab and select the variant just downloaded.
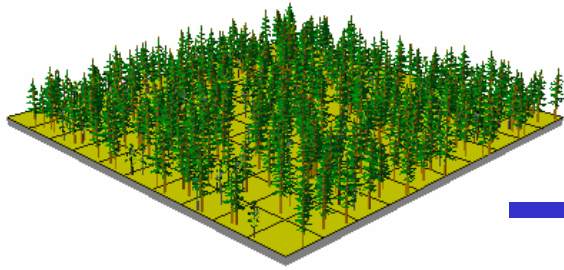
The Organon growth model variants install automatically with LMS. For more information http://www.cof.orst.edu/cof/fr/research/organon/. If another growth model is desired for use with LMS, please contact the Silviculture Laboratory at the UW College of Forest Resources for assistance: lms@silvae.cfr.washington.edu.
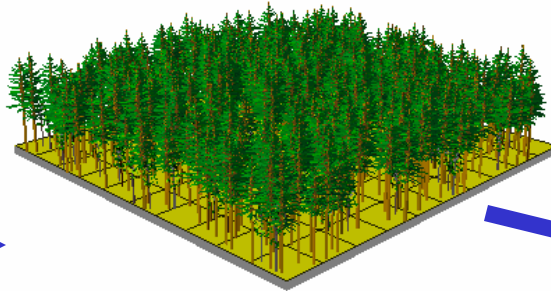
Exercise

- **Project MR_CCUT_CNTRL from 2000 to 2050, 5 yr cycles**

- **Make the following picture in ppt**

- **Create the following graphs in Excel by using data from the Volume by Size Class and Consequences LMS tables**
  - **paste the graphs in ppt**
  - **save the excel spreadsheets in C:/lmsfolio2/packexam/Exercise_Files as *.xlt, templates,for use in additional analysis exercises**
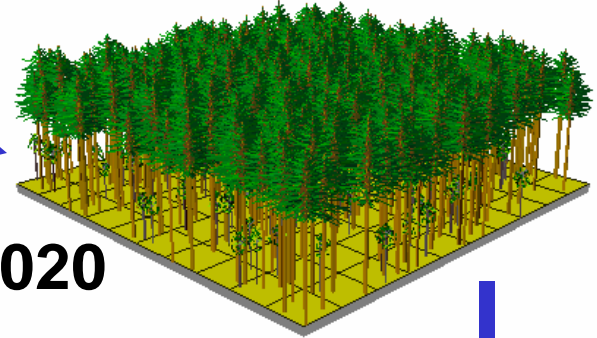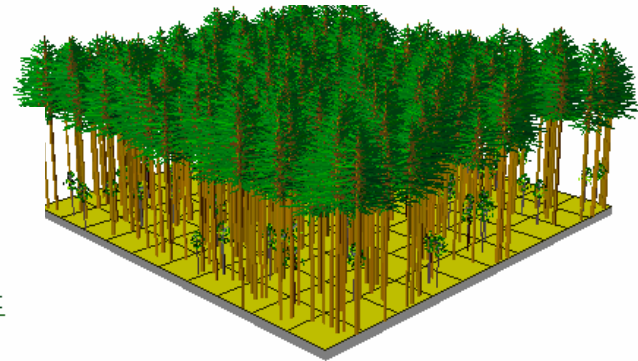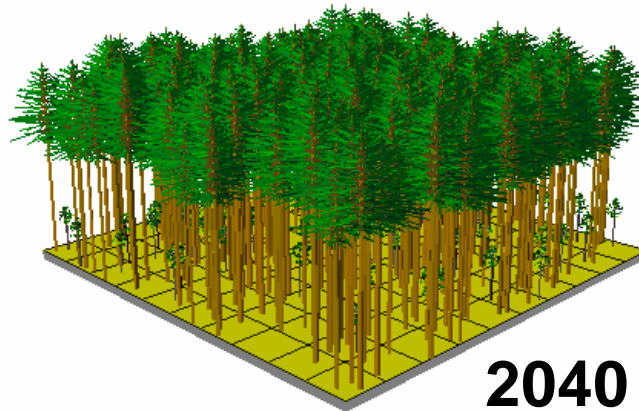
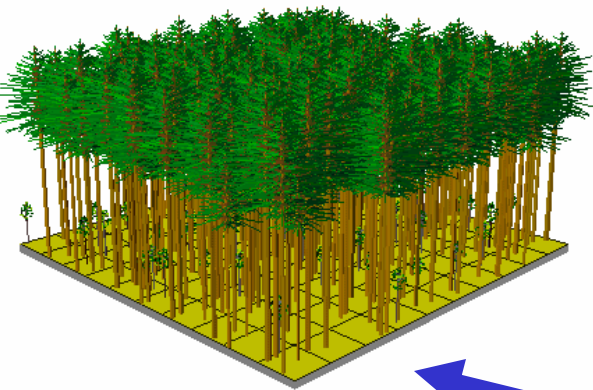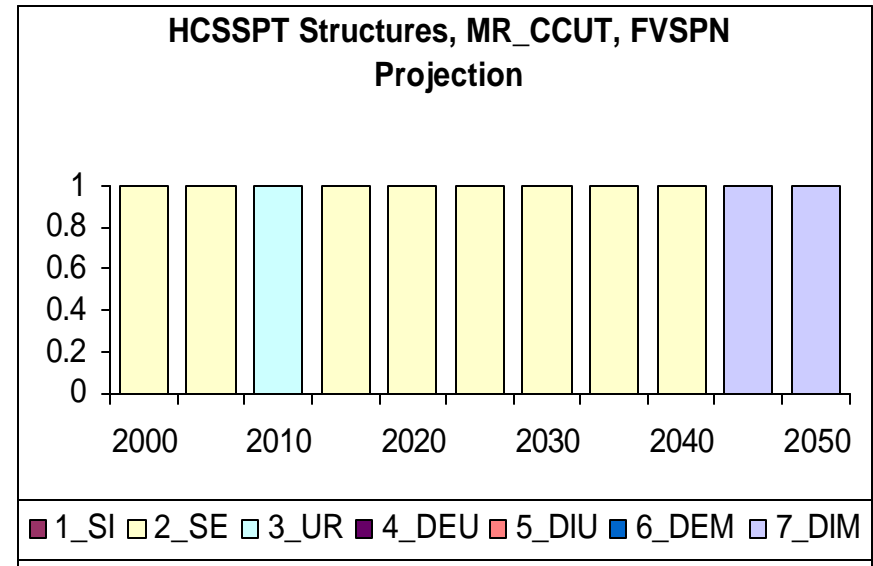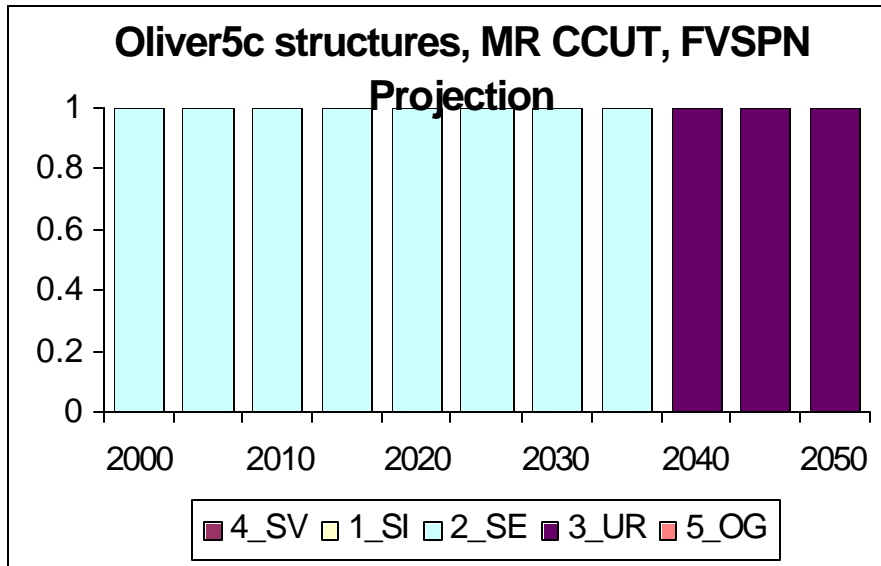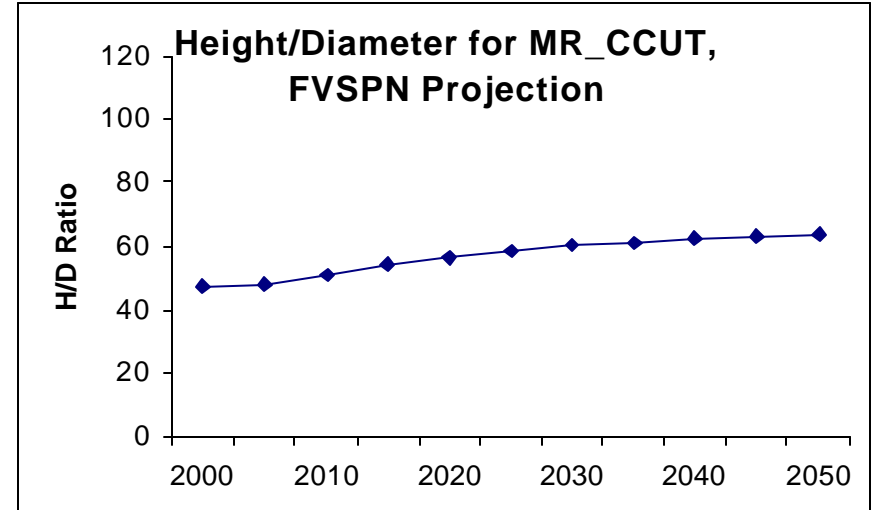# MR_CCUT-CNTRL, no treatment. FVSPN

2000

2010

2020

2050

2040

2030

Make templates from these Excel files

Volume by Tree Size, FVS, MR_CCUT — stacked bar chart of Volume (MBF) 0–1200 from 2000 to 2050, legend: pole(<12), sawtimber, large_sawtimber(>24)-(mbf/stand)

Height/Diameter for MR_CCUT, FVSPN Projection — line chart of H/D Ratio 0–120 from 2000 to 2050

Oliver5c structures, MR CCUT, FVSPN Projection — bar chart 0–1 from 2000 to 2050, legend: 4_SV, 1_SI, 2_SE, 3_UR, 5_OG

HCSSPT Structures, MR_CCUT, FVSPN Projection — bar chart 0–1 from 2000 to 2050, legend: 1_SI, 2_SE, 3_UR, 4_DEU, 5_DIU, 6_DEM, 7_DIM
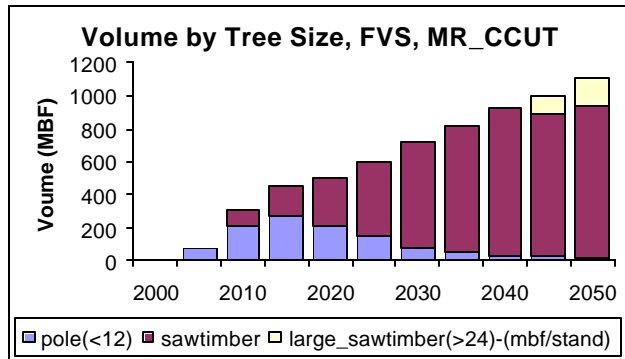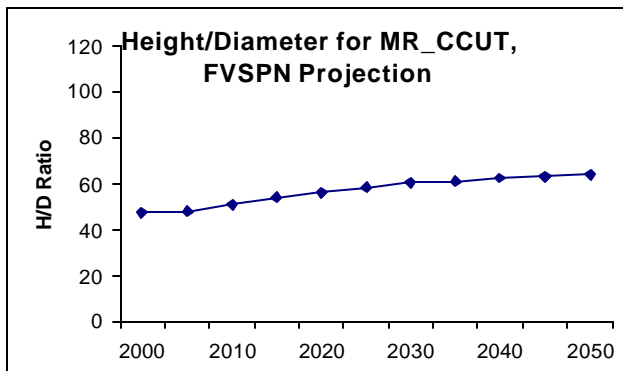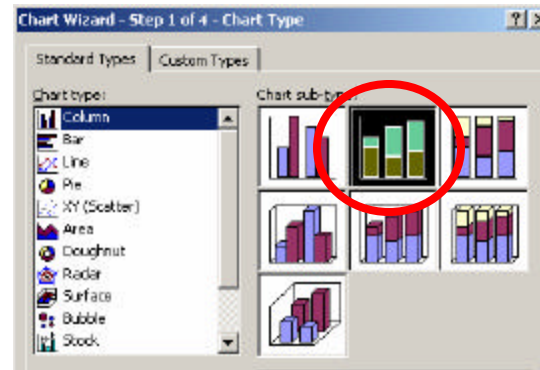
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Volume by Tree Size, FVS, MR_CCUT

Figure 6.11. The first chart is made directly with data from the Volume by Size Class table for MR_CCUT_CRTL (all years) and a column chart type.

Height/Diameter for MR_CCUT, FVSPN Projection

The height to diameter chart is created from the year and H/D(100) columns in the Consequences table. A line graph is selected as the chart type from the Chart Wizard.
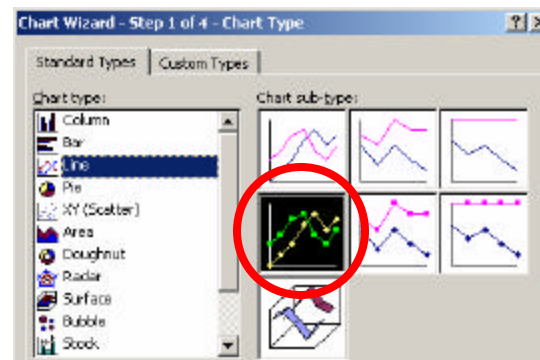

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Figure 6.12. Both of the Structural classifications charts can be created using data from either the Consequences or Structural Stages tables, however, the data must be reformatted from the original table (below left) to that of the table below right in order to graph correctly. A Boolean array of 0's and 1's is created using the stand structure abbreviations as headers and **IF statements** using **$** to anchor the statement to row 1 and column C. When this is done in cell 2D you can then drag and fill the if statement into the remaining cells to create the array.