

## Introduction to the Forest Vegetation Simulator (FVS)

This lab is intended to demonstrate the sensitivity of FVS to key input variables and introduce you to basic stand manipulation and management within FVS. You will need to download and copy the data contained within the FVS\_Lab\_Data.zip file from the [course website](#). Copy the files into the C:/FVSdata folder, this will be the default working directory that Suppose will access when looking for data.

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### Accessing the Suppose package:

If you do not see the “FVS Suppose” link on your Desktop, you will need to navigate to the following folder location: C:/FVSbin

From here, right-click on the “Suppose” program and select “Create Shortcut” and then drag the shortcut link to the Desktop.

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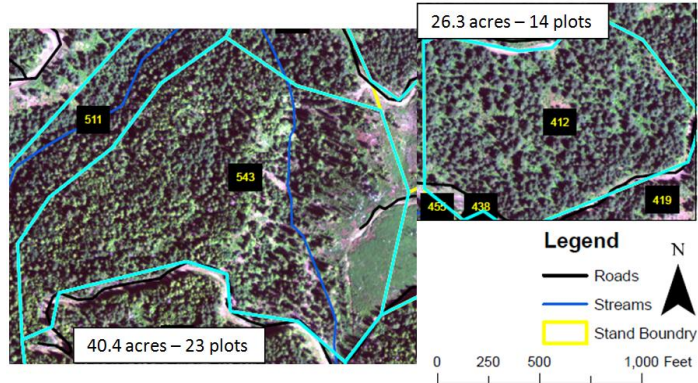
### Performing a Basic FVS Simulation

Instead of following the online Simulation Exercise, complete the following simulation steps.

**Goal: Upon completion of this exercise, the student will be able to complete a basic stand projection, change the time scale, add post processors and interpret basic output.**

The primary objective of this exercise is to simulate 80 years of growth for Stands 412 and 543 in the dataset provided and to assess the sensitivity of FVS to the inputted Potential Vegetation Code. Follow these steps and then answer the questions at the end of the exercise.

- 1) Make sure no previous simulation is in memory.
- 2) The title bar should say **\*new file\*** if the memory is clear. If a previous simulation is in memory, click **File > New**.
- 2) Click **Data Preparation > Modify/Create Locations**



- 3) Click the **Browse** button next to the “Locations File” field, select the **FOR373\_Lab\_Data.loc** file and press **Open**.
- 4) Select the option next to “Edit records that define Locations using Databases (Type C)” and then delete the pathway that is in the “Data Source” field and click the associated **Browse** button. And select the FOR373\_Lab\_Data.mdb file.
- 5) Click the **Save** button, you should get a pop-up that 1 Type C record was output. Then click the **Ok** button, you should get the same pop-up except the Edit Locations File interface should disappear.

Now you are ready to select the part of the dataset you want to work with:

- 1) Click the **File > Select locations file** menu option and select the **FOR373\_Lab\_Data.loc** file and press **Open**.
- 2) Click on the **Select Stands** button.

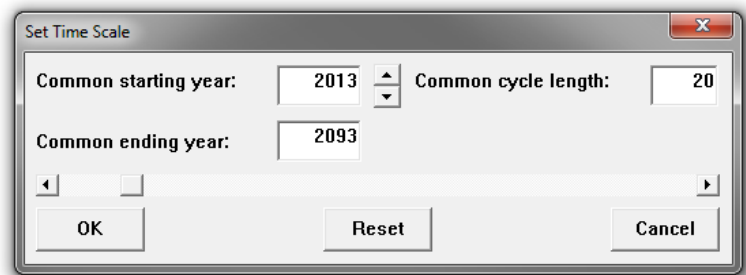
- 3) In the large **Locations** box, select **West\_Hatter\_Creek**.
- 4) In the large **Groups** box, select **All\_Stand**.
- 5) In the large **Stands** box, select both stands 412 and 543.
- 6) Now click the **Add 2 Stands** button in the bottom left corner.

*This will import the data associated with the 14 and 23 variable radius plots collected in stand 412 and 543 respectively.*

- 7) Click the Close button to close the Select Simulation Stands window.

In the main window, look at the Simulation file contents window. As options are added to simulations, Suppose updates the Simulation file contents window tracking what has been added to a simulation. Notice stand **412** and **543** was added to the simulation and a component called **From Database** was added from the input database and attached to the *All* grouping code. This option contains database keywords stored in the input database telling the FVS growth model to link to the input database to get the stand and tree data.

Now change the time scale so the stand is grown for eighty years starting in 2013.



- 8) Click on the **Set Time Scale** button.

9) Make sure the common starting year is set to **2013**. This makes FVS grow the stand up to the starting year of choice, in this case 2013.

10) Change the common ending year to **2093**. This grows the stand from 2013 to 2093 using the common cycle length of 20 years.

- 11) Click the **OK** button.

Next, let's view the main FVS output file after the simulation is run. This output is contained in a text file named after the simulation run and has an **.OUT** extension. To view the main FVS output file, select the **View the Main Output file using system editor** post processor.

- 12) Click on the **Select Outputs** button.

13) Highlight the **Base FVS Reports**, and select the **Build Cruise Statistics Report** post processor.

14) The option menu for the **Build Cruise Statistics Report** will open; click **Ok** to accept the default settings.

- 15) Click the **Close** button to close the **Model Outputs** window.

**Now you are ready to run the simulation**

- 16) Click on the **Run Simulation** button.

17) A **Save As:** window appears. The default directory is the one containing the data.

18) Type **Actual\_Habitats.key** in the proper box in the File name window.

- 19) Click the **Save** button.

20) A **Run Command** window opens. Click the **Run** button.

The simulation scrolls across a command window, which automatically closes when the simulation completes. You can open the outputted report by right-clicking on the Actual\_Habitats.out file and selecting Open With Notepad.

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### **The importance of Habitat Type**

Now we are going to change the Potential Vegetation Code for each stand to assess how it influences stand growth projections.

1) Start by opening the **FOR373\_Lab\_Data.mbd** file you copied into the FVSdata folder and then open the **FVS\_StandInit** table by double clicking on it.

2) Scroll over to the Potential Vegetation Codes (**PV\_Code**) column and switch the codes for the two stands.

FVS uses the PV\_Code to determine species establishment, competition induced mortality rates, species specific height and diameter growth rates, amongst others.

- Code 540 is a THPL/ATFI habitat code (*Thuja plicata/Athyrium filix-femina* – western redcedar/common ladyfern).

- Code 529 is an ABGR/SETR habitat code (*Abies grandis/ Senecio triangularis* – grand fir/arrowleaf ragwort).

3) Click the “**Save**” icon in the upper left corner and exit Access, your changes will automatically be updated in the Suppose interface.

4) For your changes to not override what you have already modeled, in the Suppose interface you need to click **File > Save As** and save the modified data to a to new .key file called Altered\_Habitats.key

5) You can now click **Run Simulation**, this will run the same simulation but with the modified PV\_Codes.

Now you can open and compare both the Actual\_Habitat.out and Altered\_Habitat.out file and see the influence of the Potential Vegetation Code over 80 years of growth.

**Explore the output that you created!**

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### **Lab Question:**

Find the following answers from within the outputted reports you created above. You must support your answer to receive credit; this will require you to talk about species dynamics and what the PV\_Code influences.

What impact does changing the Potential Vegetation Code have on the projected BDFT volume in 2093 for each stand? Why do you think one stand more heavily impacted than the other?