INTRO to GSG work session

**Once everyone seems settled:**

**WELCOME-please type your name, location and position in the chat.**

**Please also open https://rswaty.github.io/landfireFSC/index.html**

I am Randy Swaty, ecologist with TNC’s LANDFIRE team based out of Marquette, MI. Together with my colleague Kori Blankenship we will hopefully give you some ideas about how you might assess the ecosystems of your landscapes.

Whether you are deciphering and strategizing around the 30x30 Executive Order, working through CbD 2.0, preparing for a Forest Stewardship Council certification audit, helping your agency forest managers prioritize or planning stewardship action getting a grip on the vegetation of your landscapes is a foundational step. Today we will help you explore some pre-processed historical and current vegetation data obtained from LANDFIRE. We hope our work will illuminate the dominant ecosystems past and present, and how they’ve changed. We will feel that we have been successful if:

* Some lightbulbs go off for you
* We inspire you to analyze your landscape in a new way
* We hear from you…with questions about LANDFIRE data, assessing the ecosystems of your landscape and/or comments about this session.

With that, some housekeeping to get us started:

* Please set your ZOOM screen to “standard” view to maximize your screen space.
* We will present our work steps in three ways:
  + On my screen
  + With our voices
  + In the e-book https://rswaty.github.io/landfireFSC/index.html

Please do not hesitate to stop us at any time or type a message in the chat. If I am presenting Kori will be watching the chat and assisting, when Kori is presenting I will help.

*WALK PEOPLE THROUGH THE NEXT STEPS*

* Go to the link in the chat to get an online document that you can follow if you like
* Please also go to <https://github.com/rswaty/landfireFSC/blob/main/toDownload.zip> and download the toDownload zipped file. Unzip to a convenient location-your downloads folder may be the default and is fine for today.

*OUR LANDSCAPE*

On the Intro page of the bookdown document you will see an interactive map of our landscape called the Michigamme Highlands. Geographically it’s in the north central region of the Upper Peninsula of Michigan. The Upper Peninsula has roughly 300,000 people spread out across over 10 million acres. Driving from east to west across the UP would take about 7 hours on a good day.

Take a minute to explore the map.

*IN THE “OUR EXAMPLE LANDSCAPE” PAGE OF OUR DOCUMENT*

As you might expect winters are a thing for the Michigamme Highlands where on average the highlands can get more than 200 inches of snow per year. You are either foolish or very optimistic if you try to grow tomatoes in this area. Inland you might get some cherry tomatoes.

The forests have been managed for millennia, first by indigenous peoples then by European colonists. The area was essentially clearcut in the 1800s and has been mined regularly. Currently there is a nickel sulfide mine in the northern section. That all said, the area is stunning. You’d like it there, especially on a crisp coloful autumn day.

As you probably know the Center for Resilient Conservation Science has produced data depicting the potential for species to persist and adapt to changing regional climates. This dataset is depicted below indicating relatively high resilience for our landscape. This place has multiple rare species and is a corridor for large carnivores.

*DATASETS BY KORI*

*NOW THAT WE ARE ORIENTED TO OUR LANDSCAPE AND DATASETS-LET’S GET ORIENTED TO OUR WORK*

In the downloaded file you received three files: an excel workbook, a word file and an ArcGIS map package. Please open the Excel workbook and notice there are 5 tabs, one with the raw input data that we preprocessed for you and 4 tabs where we will work. Please consult the LANDFIRE data page and the appendix for more information on the raw data preparation. Let’s look in the “combineClean” worksheet.

* Work across the columns left to right
* Work through a couple rows to interpret

*LET’S EXPLORE THE HISTORICAL ECOSYSTEMS OF OUR LANDSCAPE*

* Tour the pivot table layout
* Go into chapter 4

**4.1 General methods**

In this section (and most others) we will depend on “Pivot Tables” in Excel. They are powerful (for better or worse!) tools that allow for tasks such as:

* organization and formatting of data
* calculations
* filtering data
* nesting data

With the power comes the call for caution. It is super easy to display values that look illuminating-but may be wrong. You can easily be duped into complacency, especially when working in the “value field settings.”

**4.1.1 A few potential traps with Pivot Tables**

Pivot Tables allow you to calculate, summarize, format and analyze datasets. There are a few traps we run into frequently that are worth mentioning here:

* **Your Pivot Table controls go away**. This happens when you click outside of the main Pivot Table area (where your values are, usually on the left side of screen). To fix this click inside one of the Pivot Table columns. Another way to fix this is to right click inside a Pivot Table cell and select “Show field list”.
* **Miscalculating.** This typically happens when you are in the “Value Field Settings” pane and select the wrong “Show values as” option. The key here is to visually inspect the results to make sure you have made the correct selection.
* **You want to remove totals and subtotals without having to delete them all.** To fix this and many formatting issues click anywhere inside of the Pivot Table -> Click “Design” from the top ribbon -> click the “Subtotals” drop down -> click “Do Not Show Subtotals”. Repeat for Grand Totals. While you are there, explore the Report Layout and Blank Rows drop downs.

**4.2 Getting at amounts of historical ecosystems**

**Start by opening the “historical” tab in the Excel workbook.**

1. In the Pivot Table Fields pane, select “BPS\_NAME” then “ACRES”.
2. Right click in the top cell of the “Sum of ACRES” column (not the column header) in the Pivot Table, then “Sort Largest to Smallest”.
3. In our example we have some BpSs that have low ACRES values. We also have categories that are not meaningful, such as “Barren-Rock/Sand/Clay”. We can do a little formatting/cleaning before making a chart:
   * To remove BpSs from the table you will click the drop-down menu to the right of “BPS\_NAME” in the Pivot Table Fields pane. You can uncheck BpSs as appropriate.
   * It is also possible to filter by right clicking on the top value in the list of BpSs, then selecting Filter > Top 10…. Once in that menu you can refine the filtering.
4. To get percentages, drag “ACRES” from the top Pivot Table Field pane to the “Values” pane. This will add a second “ACRES” column to the table. Click the drop down in the second instance of “ACRES” (reads “SUM of ACRES2” in our example), then Value Field Settings. In this menu select the “Show Values As” tab, click the “Show Values As” drop down then select “% of Grand Total% to get percentages of each BpS (make sure that”BPS\_NAME" is selected as the “Base field”).
5. To get a “running total” of percentages you will add a third instance of “ACRES” to the “Values” pane, then Value Field Settings. In this menu select the “Show Values As” tab, click the “Show Values As” drop down then select “% Running Total In” to get running totals of percentages of each BpS (make sure that “BPS\_NAME” is selected as the “Base field”).
6. Save!

# 5 Existing Vegetation Types

While looking at the historical ecosystems gives context, we also need to get a picture of which ecosystems are on the landscape today.

## 5.1 General methods

We use the same general methods as we did on the “Historical Ecosystems” page, using a Pivot Table. We rely on [LANDFIRE’s Existing Vegetation Type (EVT)](https://www.landfire.gov/evt.php) data for this assessment.

## 5.2 Getting at amounts of current ecosystems

**Start by opening the “current” tab in the Excel workbook.**

1. In the Pivot Table Fields pane, select “EVT\_NAME” then “ACRES”. Make sure that EVT\_NAME is in the “Rows” pane, and that “Sum of ACRES” is in the “Values” pane.
2. Right click in the top cell of the “Sum of ACRES” column (not the column header) in the Pivot Table, then “Sort Largest to Smallest”.
3. In our example we have some BpSs that have low ACRES values. We also have categories that are not meaningful, such as “Barren-Rock/Sand/Clay”. We can do a little formatting/cleaning before making a chart:
   * To remove EVTs from the table you will click the drop-down menu to the right of “BPS\_NAME” in the Pivot Table Fields pane. You can uncheck BpSs as appropriate.
   * It is also possible to filter by right clicking on the top value in the list of EVTs within the Pivot Table, then selecting Filter > Top 10…. Once in that menu you can refine the filtering.
   * Additionally we like to add commas and remove decimal places. To do this right click the row that contains “Sum of ACRES” in the spreadsheet (likely row “B”), select “Format Cells” > Number > set Decimal places to “0” then check the "Use 1000 Separator box.
4. To get percentages, drag “ACRES” from the top Pivot Table Field pane to the “Values” pane. This will add a second “ACRES” column to the table. Click the drop down in the second instance of “ACRES” (reads “SUM of ACRES2” in our example), then Value Field Settings. In this menu select the “Show Values As” tab, click the “Show Values As” drop down then select “% of Grand Total% to get percentages of each BpS (make sure that”BPS\_NAME" is selected as the “Base field”).
5. To get a “running total” of percentages you will add a third instance of “ACRES” to the “Values” pane, then Value Field Settings. In this menu select the “Show Values As” tab, click the “Show Values As” drop down then select “% Running Total In” to get running totals of percentages of each BpS (make sure that “BPS\_NAME” is selected as the “Base field”).
6. Save!

**6.2 Pivot table work**

Working in the “Conversion” worksheet:

1. Check the “GROUPVEG” then the “EVT\_PHYS” fields to add them to the Pivot Table. Make sure that GROUPVEG is the leftmost column. If not drag that field to the top in the Rows pane.
2. In the cell above the “GROUPVEG” field header type “past”; in the cell above the “EVT\_PHYS” type “present”.
3. If you fancy click the dropdown in the “GROUPVEG” header. Here you can remove types. Let’s remove “Barren-Rock/Sand/Clay”.
4. Check the “ACRES” field to add it to the Pivot Table.
5. Explore. Of what was historically mapped as CONIFER, what’s the biggest non-CONIFER type today?
6. Switch the order of the fields by dragging “EVT\_PHYS” to the top of the Rows pane. Which GROUPVEG type was most converted to “Developed”?