Introduction to Analyzing Ecosystem Health

LANDFIRE developed two ways to explore ecosystem health, both of which compare current conditions to reference conditions in terms of vegetation structure and composition. The formal name for the dataset and metric is Fire Regime Condition Class (FRCC), but it is just as relevant for fire-dependant and fire-independent ecosystems.

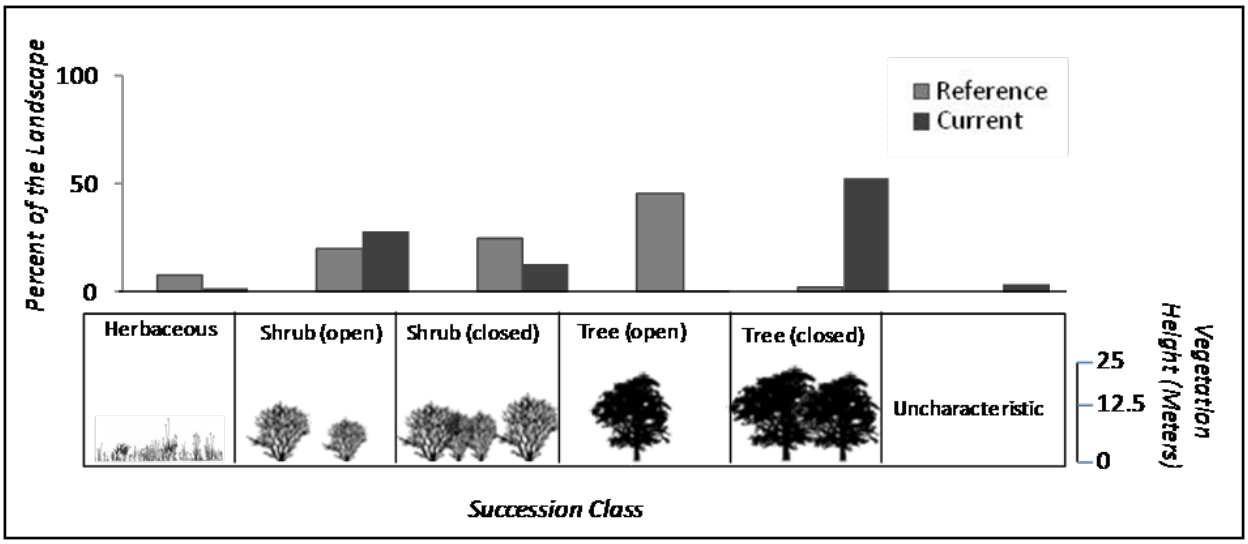
FRCC Background

The LANDFIRE FRCC map describes the relative ecological departure of current vegetation conditions from reference conditions in three classes:

1. FRCC 1: 0–33% departed or within the natural range of variability;
2. FRCC 2: 34–66% departed or moderate departure from the natural range of variability; and
3. FRCC 3: 67–100% departed or high departure from the natural range of variability.

LANDFIRE calculated FRCC based on the departure of current vegetation and structure, mapped from satellite imagery, from the reference conditions, quantified using LANDFIRE Vegetation Dynamics Models which were parameterized based on literature, local data and expert input. Complete documentation on FRCC is available from the FRCC Guidebook.

An example of reference compared to current conditions for an Oak Woodland ecosystem.



1. Use LANDFIRE Data As-Is

You can download the pre-calculated data using the LANDFIRE Data Access tool. The data provided there will allow you to map areas of your landscape that have low, moderate, and high levels of ecological departure, i.e. difference between current and reference conditions.

-OR-

2. Recalculate

While FRCC data can be useful, getting more specific information about ecological departure requires recalculating FRCC using the Fire Regime Condition Class Mapping Tool (FRCCMT). The output from this tool gives you the acres and percentage of each succession class within each ecosystem for reference and current conditions. While we are not suggesting that anyone manage towards Reference Conditions, this information can help put side-bars on Desired Future Conditions. With a little work, it is possible to reconfigure the analysis to compare current conditions to desired future conditions, mapping out the difference.

Tips

- The FRCCMT tutorial will help you work faster in the long run.
- You can use LANDFIRE datasets, your own datasets or a combination. Perhaps you have a high quality inventory for current conditions. It may be possible to adapt that for use in the FRCCMT.
- Output from the tool lands in Microsoft Excel. It's useful to have Pivot Table skills to manipulate this output (but not necessary).
- One input is reference conditions which are housed in the "RefCon" database. It is possible to change "Reference Conditions" to make them "Desired Future Conditions" for the analysis, i.e. to answer the question, "How are current conditions in relation to desired future conditions?
- LANDFIRE vegetation models represent "reference conditions," i.e., how the ecosystem looked and worked prior to European settlement.
- It is possible to follow costs and other attributes when using the Vegetation Dynamics Development Tool (VDDT).
- You will probably change a number of the disturbances to make these reference models current. For example, you may disable all fire disturbances within VDDT to emulate fire suppression.
- You may need to add succession classes to represent the situation on the ground today. For example, there may be conifer plantations that are even-aged. This succession class will not be in reference condition models.
- Building and/or adapting models is a great collaborative learning exercise.
- Game out potential strategies to identify which ones are most effective using a set of relatively simple tools like the Vegetation Dynamics Development Tool (VDDT) and the Model Adaptation Manual developed by the TNC-LANDFIRE team among others.