

Keeping Up with the Changing Landscape in Wildland Fuels

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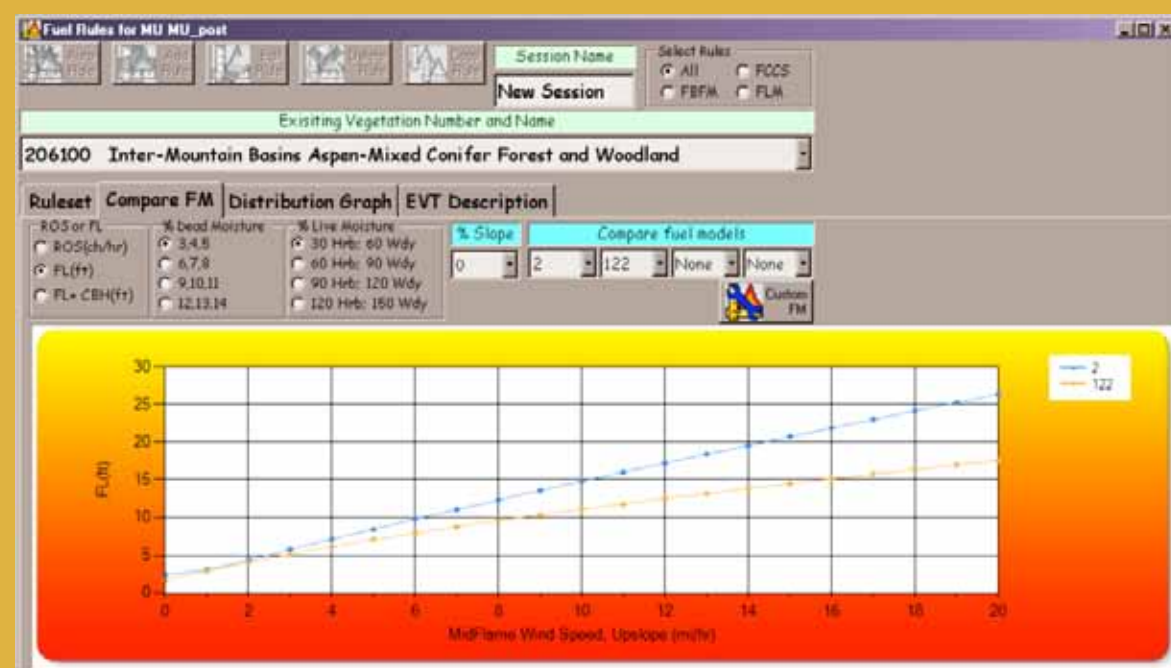
Overview

Since 2005 when Landfire published its first National layers of vegetation and fuel data, the coarse scale and inaccuracies in the data have made it difficult for analysts and fire managers to use. In an effort to better serve users, the Landfire Fuel Team set out to “calibrate” the National fuels layers with local expert input. Through a series of nation-wide workshops fuel specialists were engaged with the rectification of the fuel data and in that process ToFuΔ was developed to facilitate the changes. ToFuΔ installs as a tool bar in ESRI Arc Map allowing users to quickly & easily make changes to Landfire fuel data based on the existing vegetation type (EVT), existing vegetation cover (EVC), existing vegetation height (EVH), and biophysical setting (BPS).

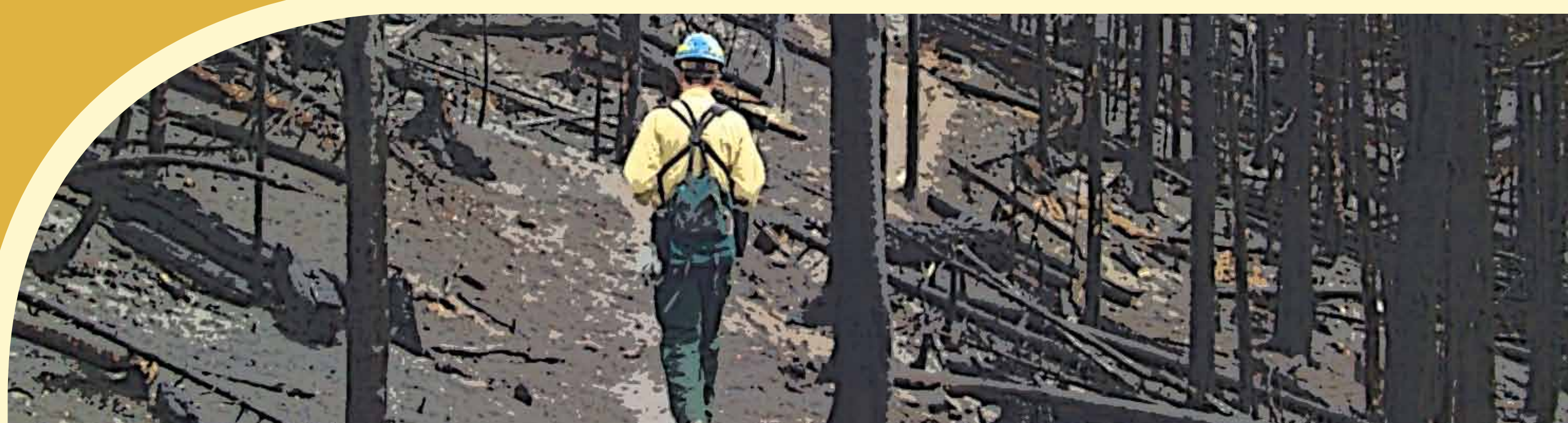
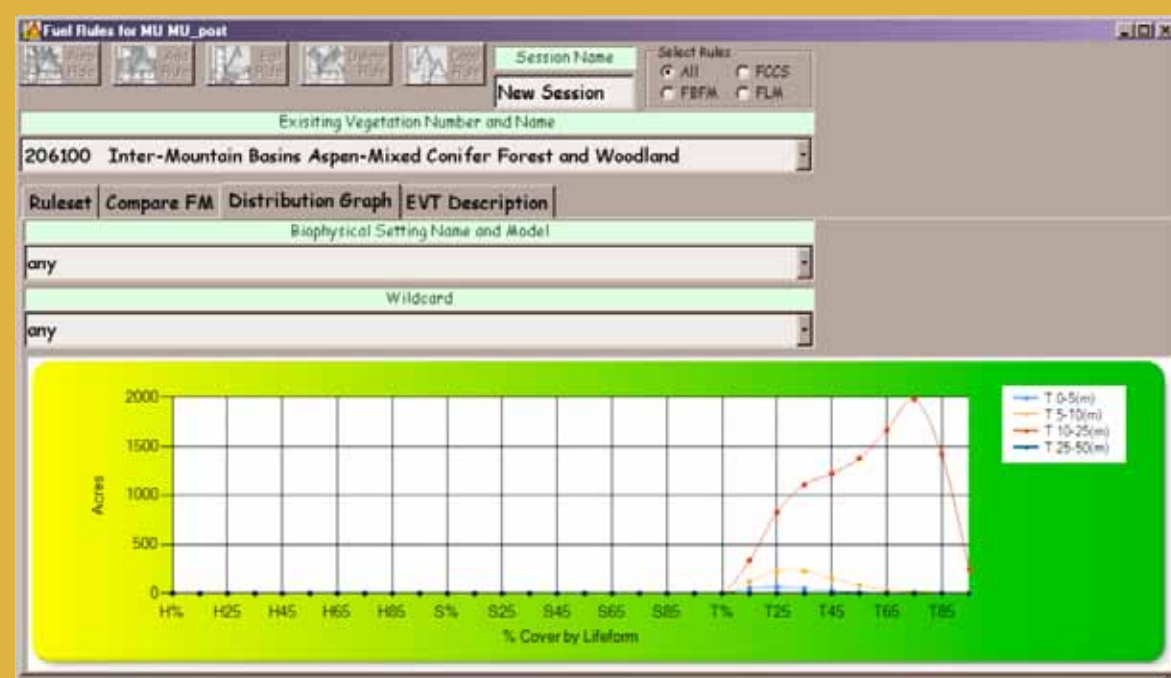
- calculations of acres and % EVT changed per rule
- compare fire behavior characteristics with an indicator for passive crown fire initiation
- creation / graphing custom fuel models
- distribution graphs to show veg. structure and quantity
- descriptions of the EVTs
- log file of date, time, adjustments, and session



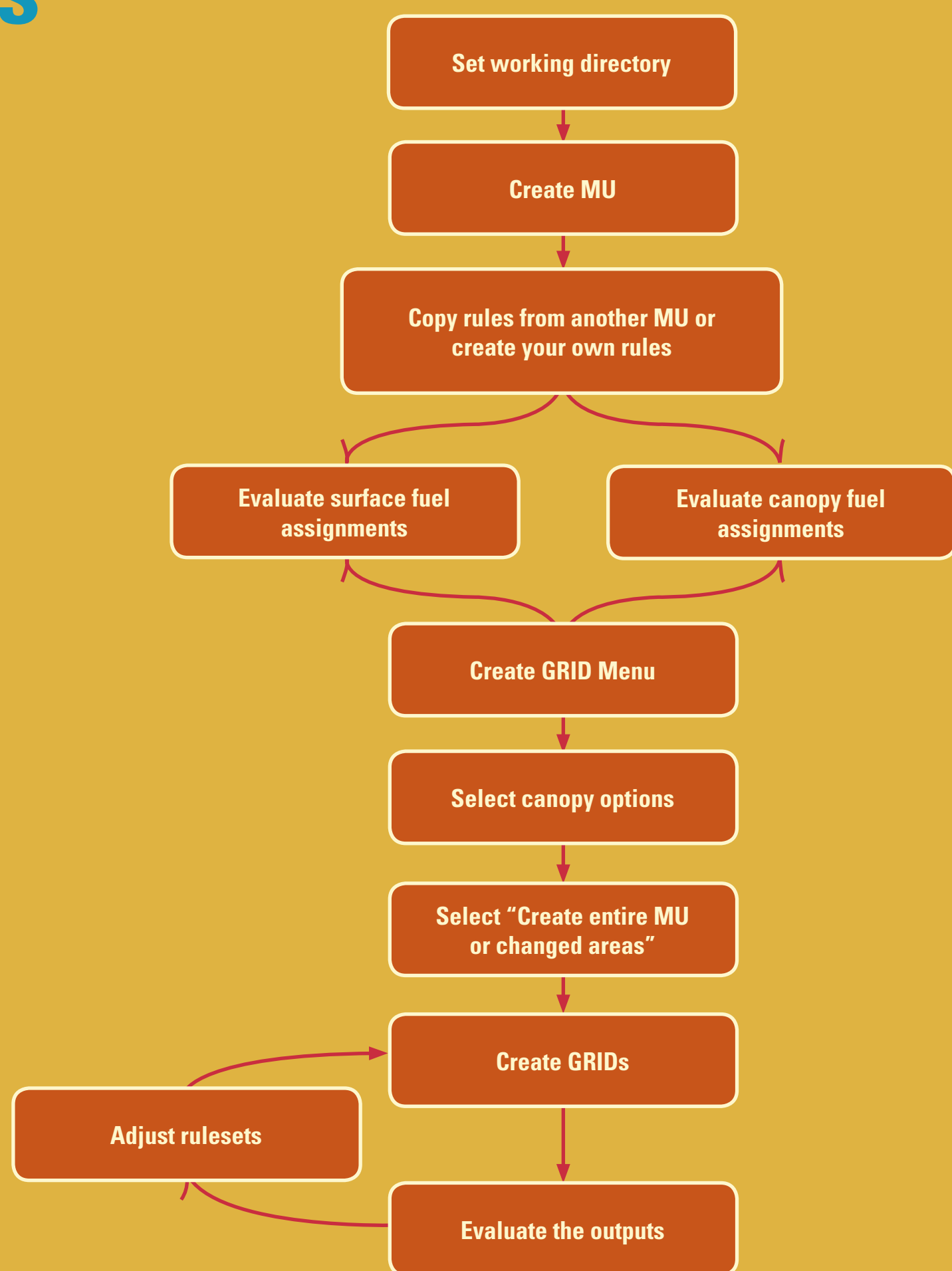
The Compare Fuel Model tab is very similar to Joe Scott's Compare 4 Fuel Models Excel spreadsheet. ToFuΔ has the added capability to compare the required canopy base heights needed for torching and crown fire initiation.



The Distribution Graph tab graphs the height of the vegetation (listed in the legend) by cover and the numbers of acres. The graph simultaneously represents tree cover (T), shrub cover (S) and herb cover (H). The number of acres is the number present in the selected existing vegetation type within the defined management unit.



Methods



ToFuΔ Work Flow

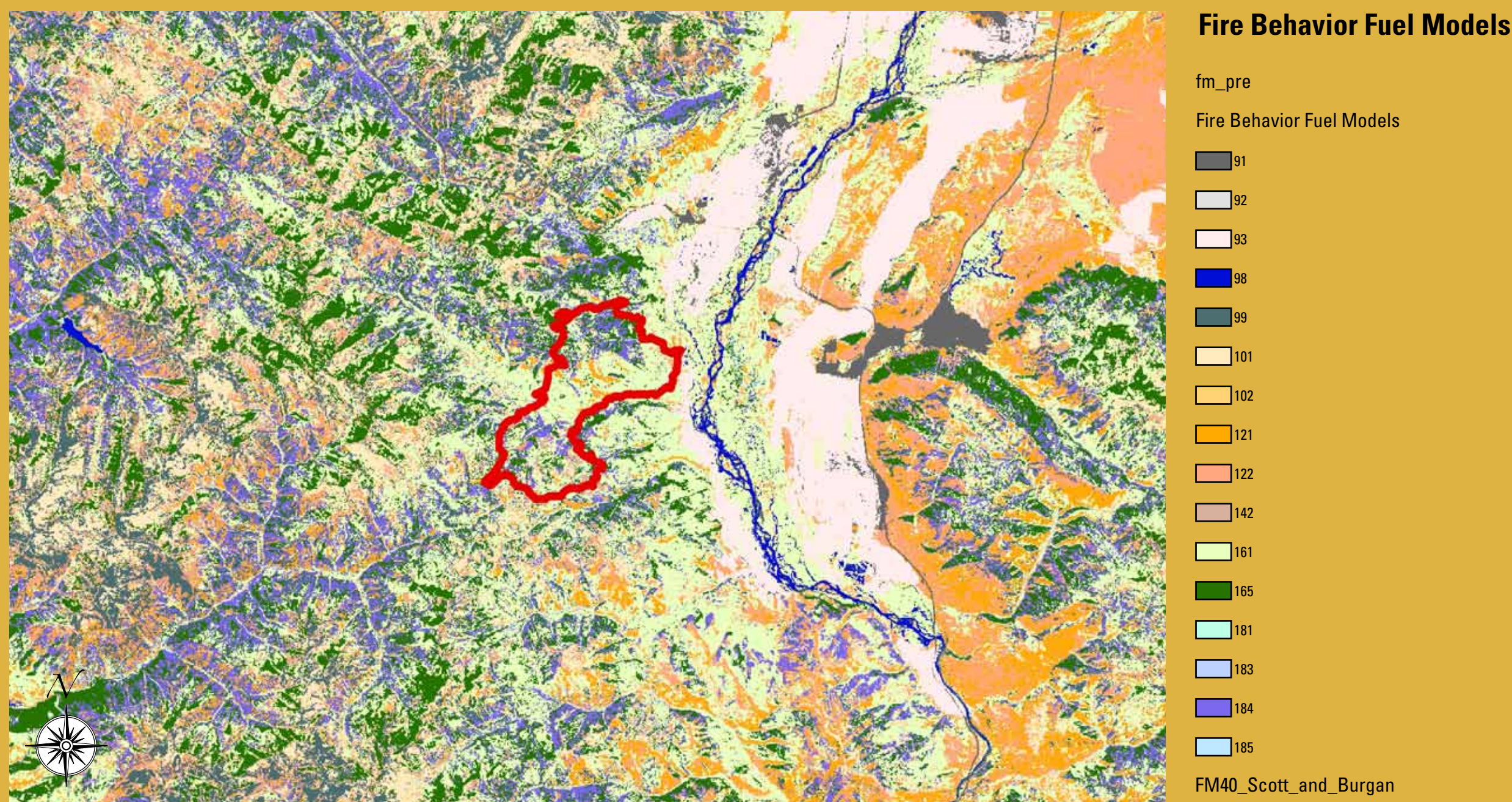
ToFuΔ ArcGis Toolbar

- Creates Canopy Base Height, Canopy Bulk Density, Canadian Fire Behavior Prediction System Fuel Types, Anderson 1982 13 Fire Behavior Fuel model, and Scott and Burgan 2005 40 Fire Behavior Fuel model GIS GRID layers.
- Adheres to landscape data file standards for use with FARSITE, FLAMMAP, WFDSS, FSPRO, FPA, and other fire behavior / fire effects programs.
- Analyzes and validates fire behavior GIS outputs.
- Helps perform routine and recurring database management operations to allow for progressive manipulation of fuel data during planning efforts, fire incidents, and LANDFIRE fuel calibration.
- Displays and describes vegetation, ecological processes, and how the data is incorporated or not incorporated in the final spatial products.
- Allows users to interact and capture local expertise of a wide range of specialists about fire behavior/fire effects and how they are spatially distributed.

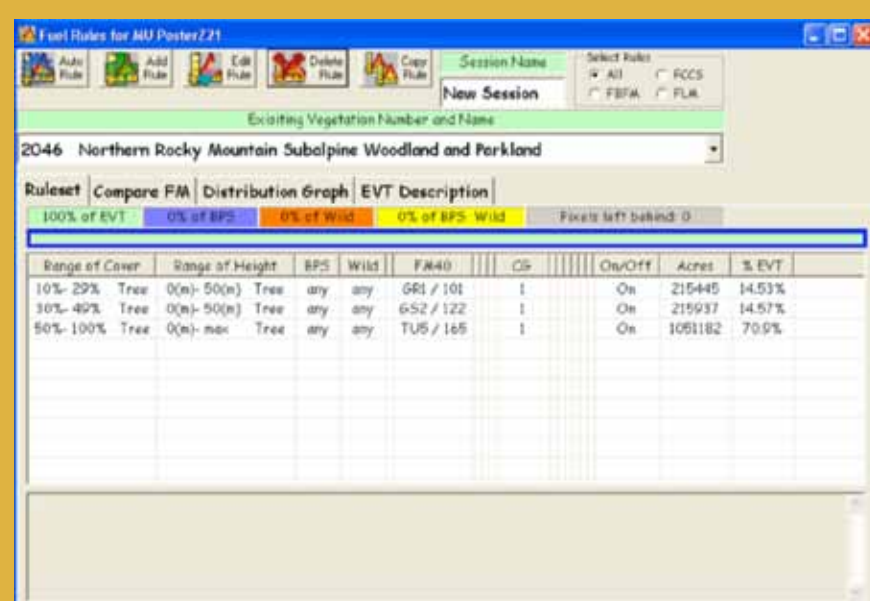
Uses

Since the beginning of its development, ToFuΔ has been requested by many fuels and fire specialists to assist them in making changes to the fuel characteristics on specific sites or entire Landfire map zones for fire planning and real time fire movement across the landscape. ToFuΔ aids the user in adjusting surface and canopy fuel characteristics to fit particular needs, whether it is for biological or fire behavior accuracy.

Green Knoll Fire-Pre



Changes to the National Landfire fuel model Data in the Green Knoll Fire scar on the Bridger-Teton National Forest.



Pre-ToFu rules from national calibration

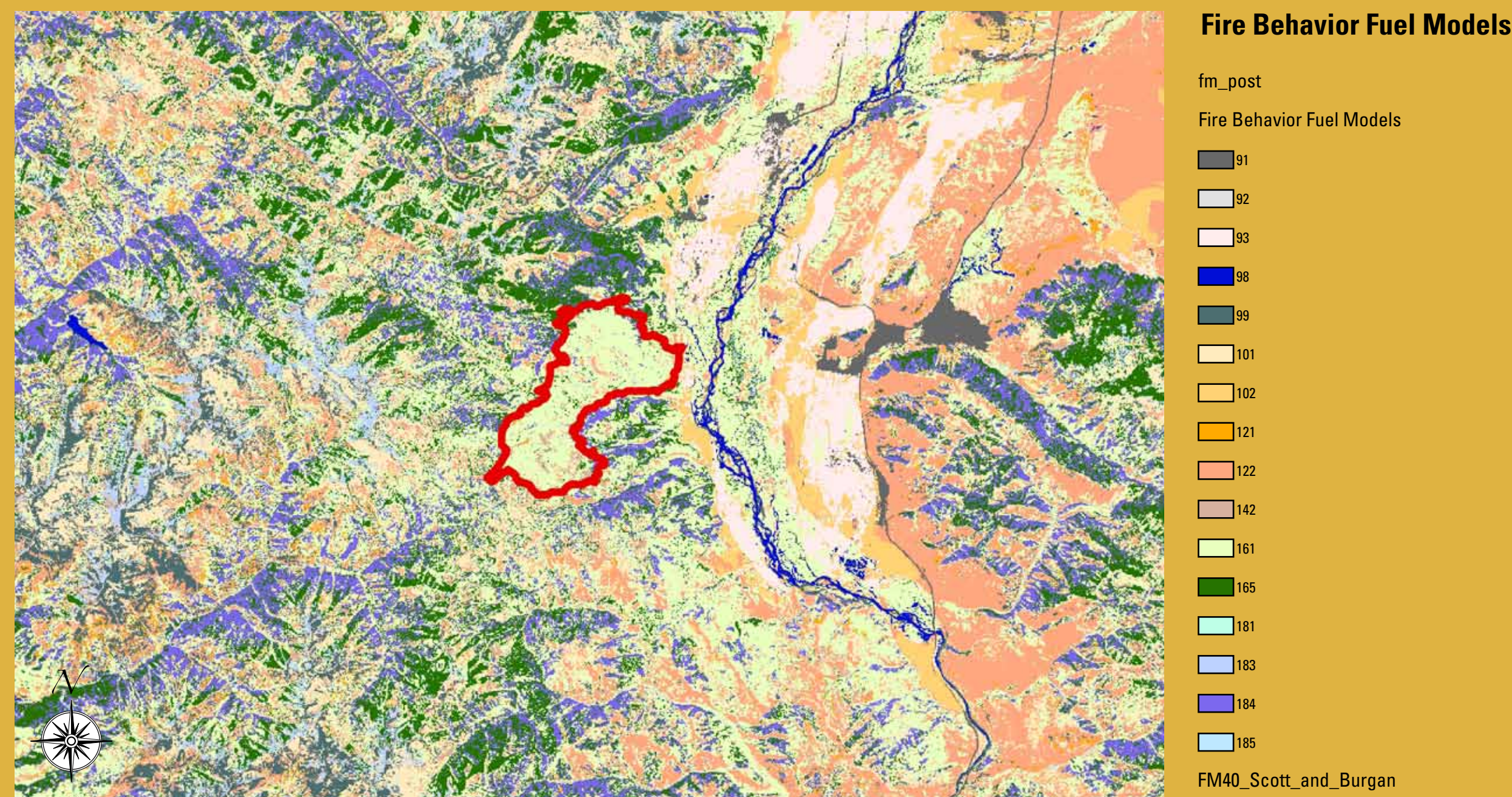


Uses Continued

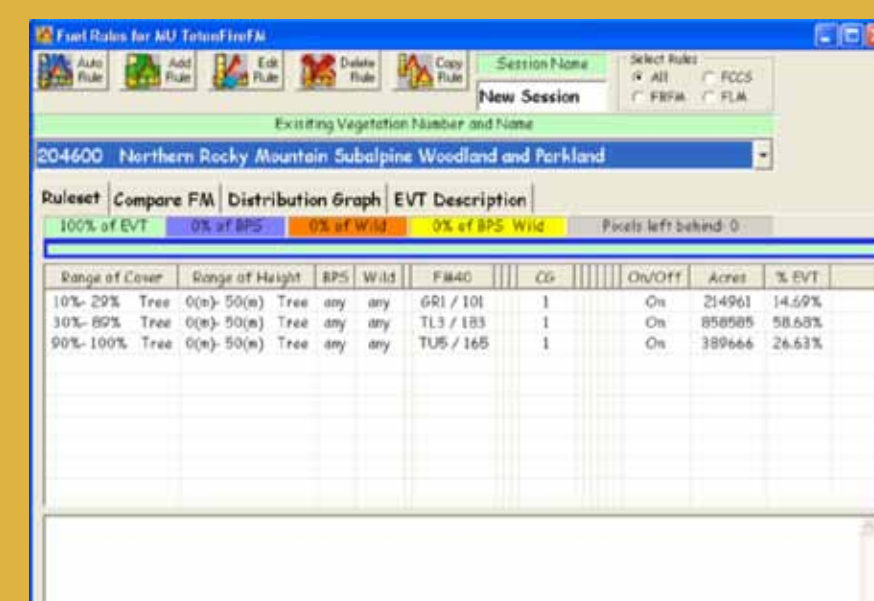
Project Objectives:

- To critique and adjust Landfire National surface fuel models for the Planning Area
- Include recent large fire disturbance polygons and their current surface fuel models into the landscape

Green Knoll Fire-Post



Changes to the National Landfire fuel model Data in the Green Knoll Fire scar on the Bridger-Teton National Forest.



Post-workshop rules

