

## *The Use of Masks to Make Changes to the WFDSS Alaska 2009 LCP*

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### **Purpose**

The purpose of this paper is to document how to make changes to the Alaska 2009 fuels layer to account for recent fires. A similar process can be followed next year to modify the LANDFIRE National “2010” LCP using the 2009 final fire perimeters as well as the masks described below. Likewise, other LCP layers (e.g., canopy cover, stand height) can be modified using a variety of non-fire masks (e.g., beetle-killed areas, detailed vegetation mapping).

### **WFDSS Alaska 2009 LCP**

The Alaska 2009 fuels data was cross-walked from the LANDFIRE Existing Vegetation Layer (EVT). The imagery used for the EVT layer was circa 2000. For that reason, fire history layers from 2000 through 2008 must be manually accounted for in WFDSS using the WFDSS landscape editor. Because WFDSS is unable to handle all final fire perimeters in a given year, the fires or masks were split east and west of Tanana, AK (see image below of 2005 fires west [yellow] and east [green]).

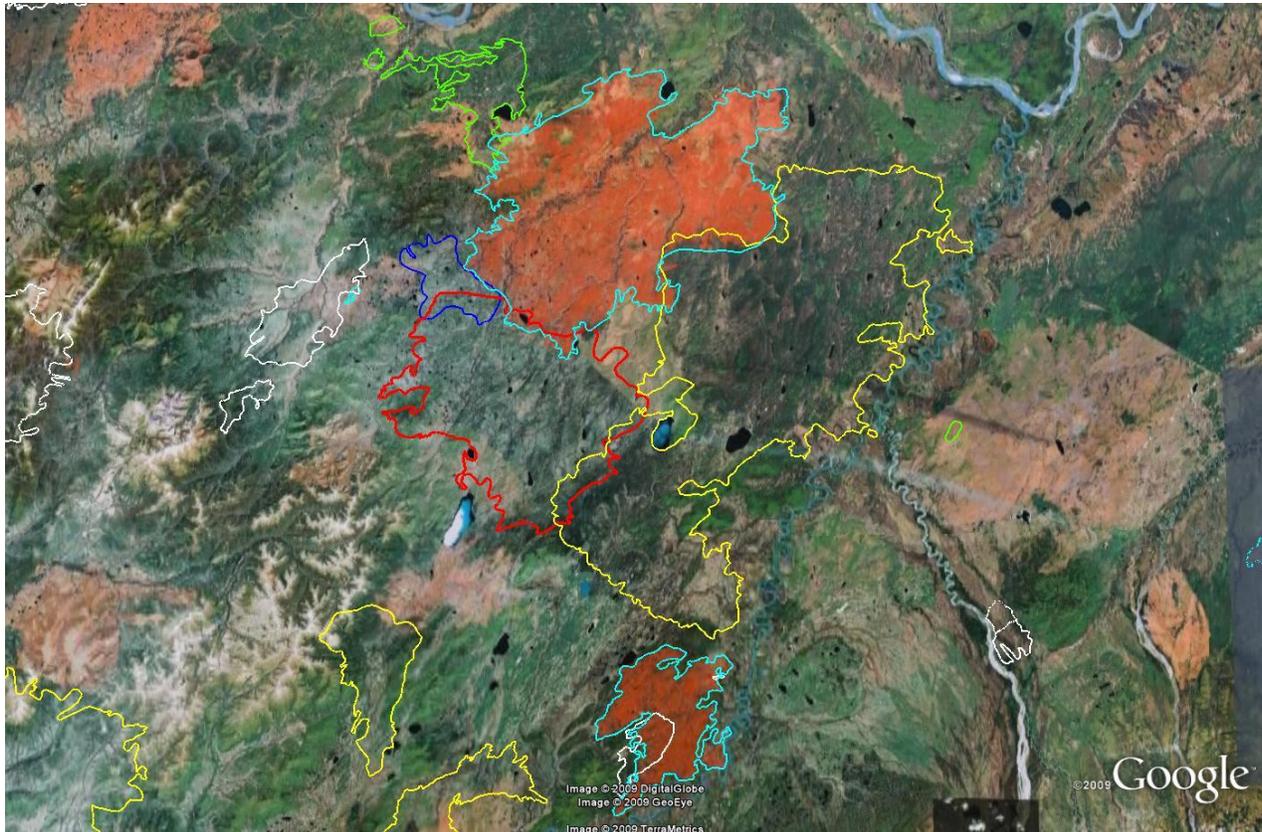


### **Step One – Downloading the Masks**

There are eighteen Alaska specific masks uploaded to an FTP site ([ftp://ftp.nifc.gov/Incident\\_Specific\\_Data/ALASKA/MASKS](ftp://ftp.nifc.gov/Incident_Specific_Data/ALASKA/MASKS)). These files have been zipped and are ready for import into WFDSS. They contain all final fire perimeters by year east or west of Tanana. To download, open *Windows Explorer* and copy/paste each file to your local drive. There is also a folder (entire\_state) that contains (1) all fires by year (will not import into WFDSS; use in a GIS\*), (2) the entire state-wide fire history (\*), and (3) a KML that contains all fires from 2000 to 2008 (for GoogleEarth).

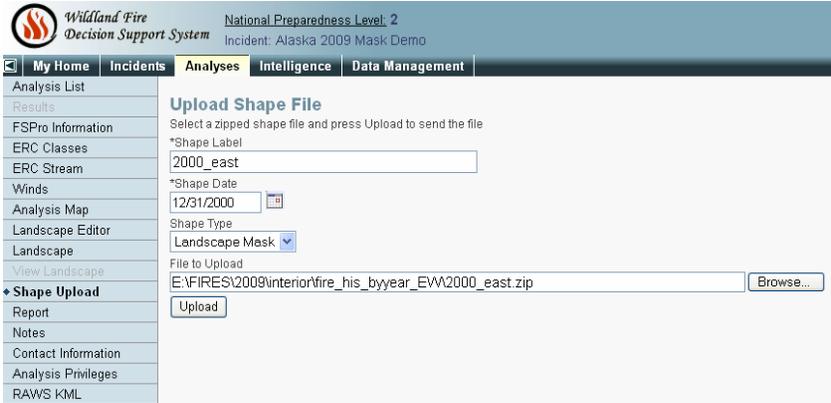
## Step Two – Determining Which Mask You Will Need

There are several sites to view current or historical perimeters (e.g., WFDSS, AICC, GoogleEarth). In WFDSS, sign into production, select the “Incidents” tab, select the incident, and click on the “Assess Situation” icon. Turn on the current fire perimeter and the historical fires layer. If you are familiar with Alaska Interagency Coordination Center (AICC) website, select “Maps / Imagery / GeoSpatial > Fire Information.” Personally, I like GoogleEarth, so below you will see an image of the fire perimeter for the Zitiziana fire (red) surrounded by fires of the past ten years. Open the state-wide historical fires KML (be patient). Upload you current perimeter and see if there are any past fires in the area. If there are, you will need to modify the fuels and possibly the canopy cover to reflect the prior burns.



## Step Three – Uploading the Masks

To upload the masks, sign into production and select the incident you are working on. Lets say there are a couple fires from 2000 adjacent to your fire. Click on “Shape Upload.” Type in one of the file names—start with 2000\_east. Set the shape date to 12/31/2000. For shape type select “Landscape Mask.” Click on “Browse” to set the path to the file on your hard drive. Click on the “Upload” button. Repeat this procedure for all applicable fires in the modeling domain.



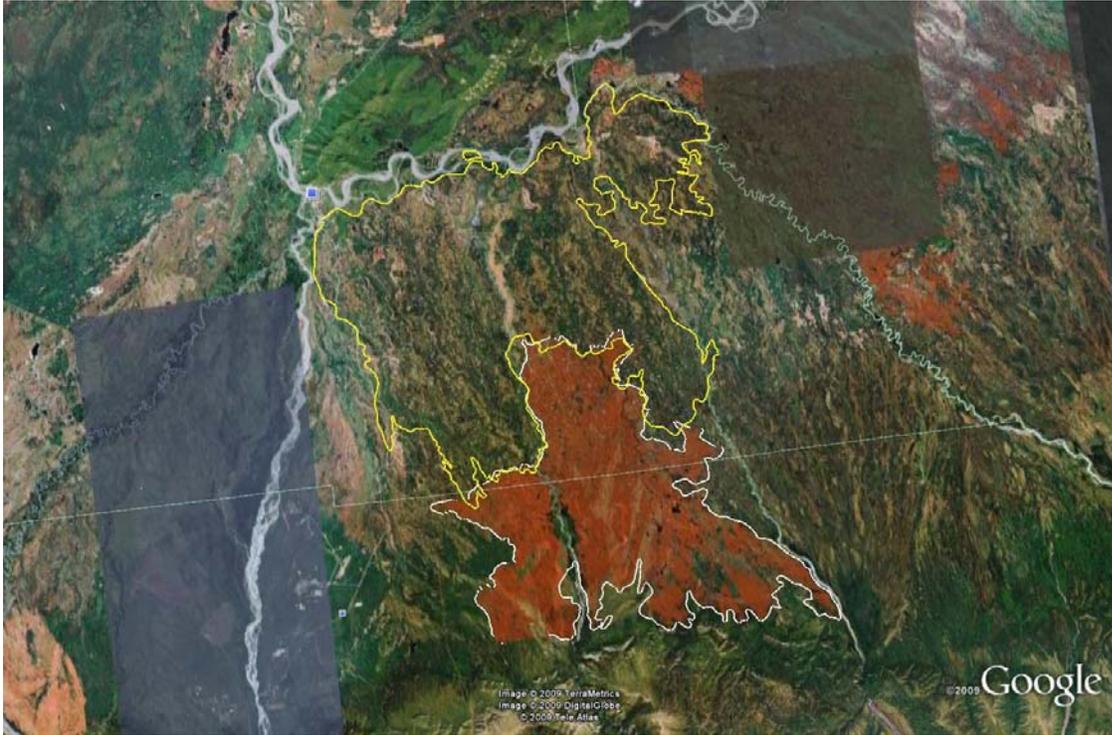
### Step Four – Using the Landscape Editor

The WFDSS landscape editor can be used to change any canopy layer. Common layers to adjust include fuel model, crown base height, crown bulk density, and canopy cover. Below I will show you how to change the fuel model layer based on a past fire.

Below is a simple table to help you determine which fuel model to assign to a given fire year.

<u>Time Since Fire</u>	<u>Fuel Model</u>	<u>Fire Behavior</u>	<u>Comment</u>
1 – 2 years*	181 (TL1)	negligible	Fire holding
3+ years	161 (TU1) (shrub/grass)	low	Fire creeping; inconsistent spread; low FL
3+ years	142 (SH2) (shrub)	low-moderate	Fire carrying; higher ROS & FL than TU1

\*Some previous fires I looked at held fires for 3 to 5 years, so adjust based on your field intelligence. For example, fire B246 in 2001 held the Parks Highway Fire of 2006, southwest of Nenana, AK (below).



**NOTE:** The above time since fire table is an estimate based on a cursory look at the historical fire layer. *It is a starting point, not an absolute.* Many factors, other than time, determine fire behavior in previously burned areas including intensity, vegetation type, site productivity, and environmental influences. The best way to determine the effectiveness duration is to (1) know where the previous fires are, (2) monitor the current fire’s progress into the previously burned area(s), and (3) adjust the masks accordingly in WFDSS.

To make changes to your LCP, select your analysis. Click on the “View Information” tab. On the left, click on “Landscape Editor.” Click “Add.”

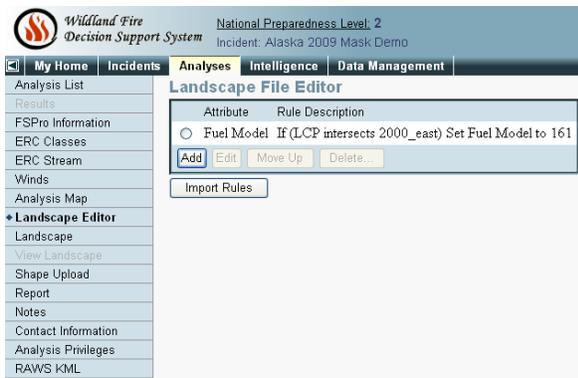
Under “Attribute to Change” select “Fuel Model.” Under “New Attribute Value” input 161. At the bottom, under “Limit Rule by Shape Mask” select the mask (fire year) and click on the double arrow pointing to the right. Review the inputs for accuracy and click “Save.” The new rule will be shown. Read it and make sure it makes sense! In this example, the rule states that every place the LCP intersects with 2000\_east (all 2000 fire perimeters in the eastern half of the state), the area will be changed to fuel model 161 (TU1). Follow the same procedure for all other historical fires. If other layers need to be modified, refer to my guidebook on LANDFIRE fuels data manipulation for several additional examples (<http://www.treesearch.fs.fed.us/pubs/31921>). On page 30, I show you how to reduce the canopy cover from 75% to 50%. Also, in Appendix B, I provide output from LCP Critique—an output used to critique a LCP. It is available in WFDSS *after you do an FSPro run* (Results > Download > LCP Critique).

The screenshot shows the WFDSS interface with the following components:

- Header:** Wildland Fire Decision Support System, National Preparedness Level: 2, Incident: Alaska 2009 Mask Demo.
- Navigation:** My Home, Incidents, **Analyses**, Intelligence, Data Management.
- Left Sidebar:** Analysis List, Results, FSPro Information, ERC Classes, ERC Stream, Winds, Analysis Map, Landscape Editor, Landscape, View Landscape, Shape Upload, Report, Notes, Contact Information, Analysis Privileges, RAWs KML.
- Main Content Area:**
  - Target Attribute:** Attribute to Change: Fuel Model (dropdown), New Attribute Value: 161, Conversion Factor: (empty).
  - Rule Conditions:**

	Minimum	Maximum
Elevation (meters)	<input type="text"/>	<input type="text"/>
Aspect (degrees)	<input type="text"/>	<input type="text"/>
Slope (degrees)	<input type="text"/>	<input type="text"/>
Stand Height (meters)	<input type="text"/>	<input type="text"/>
Canopy Base Height (meters)	<input type="text"/>	<input type="text"/>
Canopy Bulk Density (kg/m <sup>3</sup> )	<input type="text"/>	<input type="text"/>
Canopy Cover (percent)	<input type="text"/>	<input type="text"/>

    - Enter both a minimum and maximum value to specify an attribute value range.
    - Enter only a minimum value to apply this rule to attribute values greater than or equal to the specified minimum.
    - Enter only a maximum value to apply this rule to attribute values less than or equal to the specified maximum.
    - Enter neither a minimum or a maximum value if the attribute is not required.
    - Select any number of fuel models by pressing Ctrl + left mouse click.
    - Select one or more shape masks to limit the rule to the intersection of the shapes with the landscape file.
  - Fuel Models:**
    - 91 - Urban / Developed
    - 92 - Snow / Ice
    - 93 - Agricultural
    - 98 - Water
    - 99 - Bare Ground
    - 101 - Short, Sparse Dry Climate Grass
  - Limit Rule by Shape Mask:**
    - 2003
    - 2002
    - 2001
    - 2000\_east
    - 2000
    - 2000
  - Buttons:** Save, Return.



## Step Five – Verifying/Viewing the Masks/Fuels in WFDSS

To see if the masks were incorporated correctly, click on “View Landscape.” If you have not defined and created an LCP, you will have to do this (click on “Analysis Map,” define your extent [5 dice-looking icon], save the extent, create the LCP (Landscape tab), and click on “View Landscape.” Below is an LCP that was modified with the landscape editor to account for fires in 2004 in the Fairbanks area (light blue areas [fuel model 161]).

