BpS Review in the Northern Rockies
What is it? Why does it matter? How does it work?

Jim Smith
LANDFIRE Project Lead

Presented to
The Northern Rockies Fire Science Network
May 3, 2016

LANDFIRE's mission is to provide agency leaders and managers with a common "all-lands" data set of vegetation and wildland fire/fuels information for strategic fire and resource management planning and analysis.
- partner on LANDFIRE
- education, outreach, bps models
- small part of the overall LF team
Today’s Agenda

<table>
<thead>
<tr>
<th>A bit about the models</th>
</tr>
</thead>
<tbody>
<tr>
<td>How models are used</td>
</tr>
<tr>
<td>Help us improve!</td>
</tr>
</tbody>
</table>
LANDFIRE is an innovative program designed to create and update vegetation, fire and fuel data for the entire United States. Leading partners are Department of the Interior, US Forest Service and The Nature Conservancy, along with collaborators in the natural resources world who contribute knowledge, data and technical expertise. LANDFIRE supports resource management activities across the country, with spatial data, vegetation models, and powerful user tools.
LANDFIRE uses peer-reviewed scientific methods, and delivers datasets of vegetation, fire, and fuels information for all land ownership types. Products include more than 20 geo-spatial layers and relational databases that support a wide range of analysis and modeling applications – whether fire-focused or not. And you can combine datasets to assess conditions on your own landscape.
Illustration ... comprehensive/compatible

- Biophysical Settings (BpS) spatial data
- BpS Models and Descriptions-linked by BpS Code
As we progress through the presentation today, I will talk about BPS models and BPS descriptions. These are separate but linked items.
The description has multiple sections - I’ll give you a quick tour of some of them today. In the “General” section or tab we find the basic information about a BPS-where it occurs, what the natural disturbance regimes were, a vegetation description and information on where the BPS would have occurred based on soils, surficial geology, climate, etc. This information was typed in by experts, Dr. Greg Nowacki in this case, often backed up by literature. These descriptions were originally developed in an Access database. That database and PDF documents of the descriptions are available on the Vegetation Tab of LANDFIRE.gov.
While the general information is interesting to me, the real value added in my mind is on the succession classes tab. For each LANDFIRE model and description we developed 5 or fewer succession classes or seral stages. We described them in terms of species, disturbance, canopy characteristics and percent of the landscape that would have been occupied by the succession classes under natural disturbance regimes. I’ve circled a couple of items here. While these succession classes shifted around the landscape historically due to disturbance so we did not develop a historic s-class map, but we do map these today. The canopy characteristic are important for that. Also, I wanted to point out that the percentages come from the modeling we’ll discuss next.
To get an estimate of how much of each succession class would have been on the landscape we used state and transition models developed in Vegetation Dynamics Development Tool by ESSA technologies. While the modeling platform has evolved—we now use ST-Sim, the concepts are the same. Each box represents a succession class, the green lines that come out of the sides of the boxes succession and the blue lines coming out of the tops and bottoms disturbance. You’ll also see the age ranges (such as 0-5), a box label (such as “A”) and a broad structure label (such as “Open”).
The experts looked to literature, personal experience and other data to come up with information to parameterize the models. The succession classes typically represent some sort of break in development of the BpS such as when shrubs start to fill in if there is no fire, when a dominant tree starts to bear cones or when the broad structural characteristics stabilize. The model is probabilistic so we entered an annual probability of a disturbance affecting a cell in a particular succession class and what happens to that cell. When a cell is not affected by a disturbance it succeeds to the next succession class. The models were run 10 times for a thousand years, which is long enough for them to stabilize.
After review and QA/QC we delivered the bundles to the LANDFIRE mappers who ingested them into their mapping processes. In many ways it was an insane time of life for people in the LANDFIRE project.
After review and QA/QC we delivered the bundles to the LANDFIRE mappers who ingested them into their mapping processes. In many ways it was an insane time of life for people in the LANDFIRE project.
In addition to the mapping I mentioned earlier, planners in multiple agencies are using them as “starter models.” They will take the basic LANDFIRE models, add in current management such as logging or fire suppression then develop optimization models to figure out land management strategies to get them to their desired future conditions. Also, I’ll note that programs such as FSC certification refer to LANDFIRE as a place to get historic ecological information.
In addition to the mapping I mentioned earlier, planners in multiple agencies are using them as “starter models.” They will take the basic LANDFIRE models, add in current management such as logging or fire suppression then develop optimization models to figure out land management strategies to get them to their desired future conditions. Also, I’ll note that programs such as FSC certification refer to LANDFIRE as a place to get historic ecological information.
In addition to the mapping I mentioned earlier, planners in multiple agencies are using them as “starter models.” They will take the basic LANDFIRE models, add in current management such as logging or fire suppression then develop optimization models to figure out land management strategies to get them to their desired future conditions. Also, I’ll note that programs such as FSC certification refer to LANDFIRE as a place to get historic ecological information.
There has been no comprehensive review of the LANDFIRE National model set since their original delivery from 2005 through 2009, only sporadic, ad hoc, inconsistent review based upon immediate opportunity. Since then, errors and inconsistencies have been discovered, and missing information identified. There is reason to believe that supporting science may have improved. Thus, the time is right to review and potentially revise LANDFIRE National BpS models. Leading the review process is The Nature Conservancy’s (TNC) LANDFIRE team.

Why Review the BpS?

- Reduce duplication
- Fix “blunders” e.g. typos, inconsistencies, etc.
- Integrate new science and new experts. *Ten years is a long time!*
- Potential for creating a more useful delivery system
- Updated modeling software
We are certain we can improve the BpS descriptions and bundles with your help, though not everyone agrees. Some feel that we will only make them different...We also know that there will be conflicting views. We will do our best to reconcile differences. We will try to make this process as painless and interesting as possible.
The BpS review involves three steps: model cleaning, model updating, and model delivery. If you know how vegetation systems function, or have ideas how we can better deliver the information, we want your expertise and input. Start at the BpS review website where you’ll find information on how to join the effort.
The BpS review involves three steps: model cleaning, model updating, and model delivery. If you know how vegetation systems function, or have ideas how we can better deliver the information, we want your expertise and input. Start at the BpS review website where you’ll find information on how to join the effort.
The BpS review involves three steps: model cleaning, model updating, and model delivery. If you know how vegetation systems function, or have ideas how we can better deliver the information, we want your expertise and input. Start at the BpS review website where you’ll find information on how to join the effort.
The BpS review involves three steps: model cleaning, model updating, and model delivery. If you know how vegetation systems function, or have ideas how we can better deliver the information, we want your expertise and input. Start at the BpS review website where you’ll find information on how to join the effort.
The BpS review involves three steps: model cleaning, model updating, and model delivery. If you know how vegetation systems function, or have ideas how we can better deliver the information, we want your expertise and input. Start at the BpS review website where you’ll find information on how to join the effort.

Take-Home Messages

- WHAT: LANDFIRE BpS has three parts - spatial data, text description, and quantitative state-and-transition models - all explicitly linked.

- WHY: LANDFIRE BpS models/descriptions are important to the LANDFIRE Program and to external natural resource communities.

- HOW: LANDFIRE BpS models/descriptions are being reviewed....and PLEASE participate.

http://www.landfirereview.org/
Online Connections


Conservation Gateway: [http://nature.ly.landfire](http://nature.ly.landfire)

Twitter: [@nature_LANDFIRE](https://twitter.com/nature_LANDFIRE)

YouTube: [LANDFIREvideo](https://www.youtube.com/c/LANDFIRE)

Bulletins/Post cards via e-mail

Email: LANDFIRE@tnc.org

Questions? Comments?

Jim_Smith@tnc.org

Kori Blankenship
kblankenship@tnc.org
Fire Ecologist

Randy Swartz
rswartz@tnc.org
Ecologist

Sarah Hagen
shagen@tnc.org
Spatial Ecologist

Kim Hall
kimhall@tnc.org
Climate Ecologist

Jeannie Patton
jpatton@tnc.org
Communications