Welcome to the LANDFIRE and California Fire Science Exchange webinar. I’m Jeannie Patton, Communications Lead for The Nature Conservancy’s LANDFIRE Program. This is one of a series of webinars offered in partnership with the Fire Science Exchange Network that look at LANDFIRE’s Biophysical settings review project. Today’s is the fourth in our California series; other regional presentations are scheduled through the spring.

The webinars are recorded and posted on the LF YouTube channel about a week after we host them live. We publicize the webinars via the LANDFIRE Bulletin, so if you do not subscribe yet, please do. The link to subscribe is on the last slide of this presentation.

Today’s presenter is Kori Blankenship, Fire Ecologist with The Nature Conservancy’s LANDFIRE team.

Kori joined TNC in 2005 when she was hired to facilitate the creation of thousands of vegetation dynamic models for ecosystems across the US. She earned undergraduate and graduate degrees in Geography from Western Washington University’s Huxley College of the Environment; graduate research investigated seasonal changes in fire behavior and effects in the dry forests of north central Washington State. Kori worked as a GIS specialist at the Missoula Fire Sciences Lab and as a wildland firefighter in Washington and Colorado for the NPS and USFS. Her current focus is on taking the
results of the first five years of the LANDFIRE project and applying the processes and products toward addressing conservation challenges on large landscapes and ecosystems. Kori lives in Bend, OR. She is one of the leaders of the BpS Review and Update project.
Introduce the TNC-LANDFIRE team
Announce agenda

Today’s Agenda

- BpS Models 101
- Using the BpS Models
- Improving the BpS Models
BpS models are important because they:

- Help us to understand complex ecological processes and relationships
- Provide a framework for exploring alternative approaches to accomplish landscape goals

- Focus on disturbance and succession dynamics
- Help us understand complex ecological processes and relationships
- Connected to spatial data
- Cover about 500 veg types around the country
- LF models can complement local models; Hugh’s ~5 forest models and others
Southern California Coastal Scrub

First example of modeling and description
Replacement fire return intervals

Replacement fire
Reference conditions
Mediterranean Dry-Mesic Mixed Conifer Forest

Image: Plumas-Eureka SP mixed conifer forest.jpg, found on Bing images, free to share and use
Succession
Succession and alt succession
For simplicity, only included FRI for the most frequent fire transitions.
Insects and disease
More frequent in closed classes
AllFire FRI = 11yrs  Replacement FRI = 150yrs

Mixed FRI = 35yrs  Surface FRI = 17yrs

Bps # 0610270
Creating the BpS Models

- Collaborative process facilitated by TNC-LF
- Represent collective ecological knowledge of hundreds of people around the country
  -> 700 contributors to the models, >40 expert workshops plus individual meetings
<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th><strong>Limitations</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover ~500 BpS</td>
<td>Don’t include management or climate change</td>
</tr>
<tr>
<td>Connected to spatial data</td>
<td>Modeling constraints</td>
</tr>
<tr>
<td>Relatively easy to use, supported by LANDFIRE</td>
<td>Non-spatial</td>
</tr>
<tr>
<td>Good documentation</td>
<td>Difficult to validate, limited information</td>
</tr>
<tr>
<td>Suitable for large landscapes</td>
<td>Refine for local use</td>
</tr>
</tbody>
</table>

Documentation – state assumptions in the description, numbers in model are explained in the description
-LANDFIRE use of model info
-fire frequency and severity, FRG, succession class, VCC
Graph modified from Safford et al. Historical Ecology, Climate Change, and Resources Management: Can the Past Still Inform the Future?; Chapter 4 in Weins et al. 2012.
This work was undertaken by some of our Nature Conservancy Colleagues in Nevada – Louis Provencher, Greg Low and Susan Abele.

They used VCC and BpS models as a primary component of a conservation action plan that was designed to improve ecological conditions, reduce fire risk and maintain livelihoods.

But, importantly they had to have a plan with community buy-in. The VCC metric and the ecological models that underlie it were an important part of creating that buy-in.

*Photos: Bodie Hills CAP Report, 2009*
• This is the Bodie Hills study area. It is located on the east slope of the Sierra Nevada on the border between CA and NV.
  • The landscape is about 192,000 acres, it is largely unfragmented and it includes historic Bodie State park.
  • BLM is the primary land manager, 30% of the area is in private ownership.

• There are very few invasive species in the landscape. Cheatgrass is the primary invader and is found mostly along roads and at lower elevations.
• The landscape has a large, well documented, genetically distinct Greater Sage-Grouse population.

Photos: Bodie state park (provided by L. Provencher), cheatgrass (NPS Photo by Jim Pisarowicz; http://www.nps.gov/wica/naturescience/grasses-cheatgrass.htm), sage grouse (usfws http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/)
For this planning process The Nature Conservancy used a technique developed by Louis Provencher, Greg Low and Susan Abele called Landscape Conservation Forecasting.

This technique is designed as a process that involves stakeholders in modeling ecological conditions under current and potential, collaboratively developed future management scenarios.

Notice the predictive ecological models are key to this process.

The final step is to recommend a set of actions based on a return on investment calculation that predicts where you will get the biggest bang for your buck in terms of your management investment and your predicted vegetation conditions.
• They started with LF BpS models and adapted them with local knowledge and data to represent the Bodie Hills area.
• They added in management actions and costs.
• Then, they ran various management scenarios to test how the ecosystem would respond over a 20-year time frame.
The models were run to simulate various scenarios including 20 years without management and 20 years of ecological management. This table shows the expected change in ecological condition after 20 years under these scenarios compared to the current condition. The models in combination with the VCC metric become a basis for evaluating management strategies and a key factor in determining where and how to invest resources in restoration.

(N/A refers to systems that were not assessed because they were not a high priority or were dealt with elsewhere. For example, the Mountain Shrub ecosystem is very small (~50 acres) and intertwined with Montane Sagebrush Steppe so it is managed as part of the Sagebrush Steppe system.)
Using the models and the information they contain, the Bodie Hills group was able to come up with specific management actions for each ecosystem of interest that help achieve the objectives for each individual ecosystem.

This slide shows the actions and costs for managing Montane Sagebrush Steppe in order to improve its condition and to reduce fire risk to the historical Bodie State Park.

Some of the actions include different types of prescribed fire. Also notice, that there is a cost associated with each action which is tracked in the STM model.
• Within months of project completion, USFWS provide $100,000 of stimulus funding to restore wet meadows adjacent to sagebrush used by greater sage-grouse on private lands. The project was funded specifically because of the stakeholder plan that was developed.
• Picture shows wet meadow restoration project completed 1.5 years ago
• The BLM can’t move forward with management actions until the environmental assessment is reviewed.
• Ecological models were at the core of the process that was used to develop an acceptable plan.
• Models themselves are not the answer. Models provide a structured framework that facilitates working together (even by people who have been adversarial in the past); the approach utilizes the best available science, allows participants to quickly game out scenarios to test everyone’s ideas, allows for easy sensitivity testing; for these reasons, models were a key component in the success of the Bodie Hills plan (and in other areas, e.g. Cherokee National Forest).

*Picture: wet meadow restoration, L. Provencher*
landfirereview.org

Feel great about improving products that inform ecologically based land management across the U.S.

Submit your review via email.

Go to landfirereview.org and learn about the review process.

Download a BpS description of interest. Length varies but most are 4-10 pages long.

Yes, yes...I like this...wait, there's something missing here. OK, good. Oh no, they are missing information from my latest study...OK...better...

Read the description and provide feedback.
BpS models are important because they:

- Help us to understand complex ecological processes and relationships

- Provide a framework for exploring alternative approaches to accomplish landscape goals

-focus on disturbance and succession dynamics
-help us understand complex ecological processes and relationships
-connected to spatial data
-cover about 500 veg types around the country
-LF models can compliment local models; Hugh’s ~5 forest models and others
<table>
<thead>
<tr>
<th>Online Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation Gateway: <a href="http://nature.ly.landfire">http://nature.ly.landfire</a></td>
</tr>
<tr>
<td>Twitter: <a href="https://twitter.com/@nature_LANDFIRE">@nature_LANDFIRE</a></td>
</tr>
<tr>
<td>YouTube: <a href="https://www.youtube.com/LANDFIREvideo">LANDFIREvideo</a></td>
</tr>
<tr>
<td>Bulletins/Post cards via e-mail: <a href="http://eepurl.com/baJ_BH">http://eepurl.com/baJ_BH</a></td>
</tr>
<tr>
<td>Email: <a href="mailto:LANDFIRE@tnc.org">LANDFIRE@tnc.org</a></td>
</tr>
</tbody>
</table>

Ways to reach LANDFIRE