Using the LANDFIRE Biophysical Settings Model Descriptions

National Interagency Fuels Technology Team

www.nifft.gov

Overview

In this document, you'll learn the following: First, we'll discuss what biophysical settings (BpS) and the associated LANDFIRE BpS models are. Second, you'll learn how you can use the BpS models and associated descriptions. After that, we'll go over some background information on how they were created. We'll then illustrate how to obtain the BpS descriptions from the LANDFIRE website, and you'll download an example BpS model description. And finally, we'll examine the major elements of the model descriptions and briefly look at the ancillary files included with the descriptions.

1. What are Biophysical Settings (BpS) and BpS Models?

In 2005, the LANDFIRE Project began creating numerous models to describe natural ecosystems – also known as "biophysical settings" – as they existed before Euro-American settlement. What, specifically, are biophysical settings? Biophysical settings (BpS) represent the vegetation that may have been dominant on the landscape prior to Euro-American settlement and are based on both the current biophysical environment and an approximation of the historical disturbance regime. The LANDFIRE BpS models describe vegetation, geography, biophysical characteristics, succession stages, and disturbance regimes for each BpS and some of the major disturbance types affecting these ecosystems prior to significant alterations by European settlers.

Note that various terms other than biophysical settings are sometimes used to describe natural, pre-settlement ecosystems; for example: "historical vegetation," "reference conditions," and "potential natural vegetation." Also, on www.landfire.gov, the models are named LANDFIRE Vegetation Dynamics Models (whereas in the model descriptions they're titled LANDFIRE Biophysical Setting

Models).

2. How are Biophysical Setting Models and Descriptions Used?

LANDFIRE BpS Models provide land managers with a historical (pre-European settlement) perspective of landscape conditions. The BpS models serve as a potential baseline from which to compare historical to current conditions. Planners can thereby identify which vegetation composition and structures are overrepresented or are lacking on a specific landscape. Using the LANDFIRE BpS models and the associated descriptions, planners and managers can investigate and identify a way forward that is more likely to provide the future conditions they desire.

Note: If you choose to print this document, please do so in color in order to clearly view the graphics below.

3. Background

3.1 Developing the Models

So, how were the models developed? Between 2005 and 2009, numerous modeling workshops were held across the U.S. in which teams of local experts were solicited to develop BpS models for LANDFIRE mapping zones. Modelers, such as USFS, BLM, NPS, BIA, and FWS employees, representatives from The Nature Conservancy and other NGOs, state agencies, and academics spent an intensive week in the modeling workshops. They compiled professional literature and local knowledge and used public-domain software to describe and quantitatively model the array of biophysical settings in each LANDFIRE map zone.

Before proceeding, it will be useful to read two short LANDFIRE documents to obtain a good overview of this nearly five-year modeling effort.

To enhance your understanding of the BpS concept and the LANDFIRE BpS modeling process, please open a web browser and read the data product description located on landfire.gov at: http://www.landfire.gov/NationalProductDescriptions24.php, and after reading that page, please return to this document. We will be exploring other related pages on that site later on in this document.

4. Obtaining the LANDFIRE BpS Model Descriptions

We will use a series of screen captures illustrating the downloading process to help you navigate through the sequence of BpS Model pages on www.landfire.gov. We recommend that you conduct a live download as you read through the material below. You'll want to first ensure that PDF-compatible software, such as Adobe Reader, has been installed on your computer. In addition, you may want to save this document to serve as a how-to guide for future use.

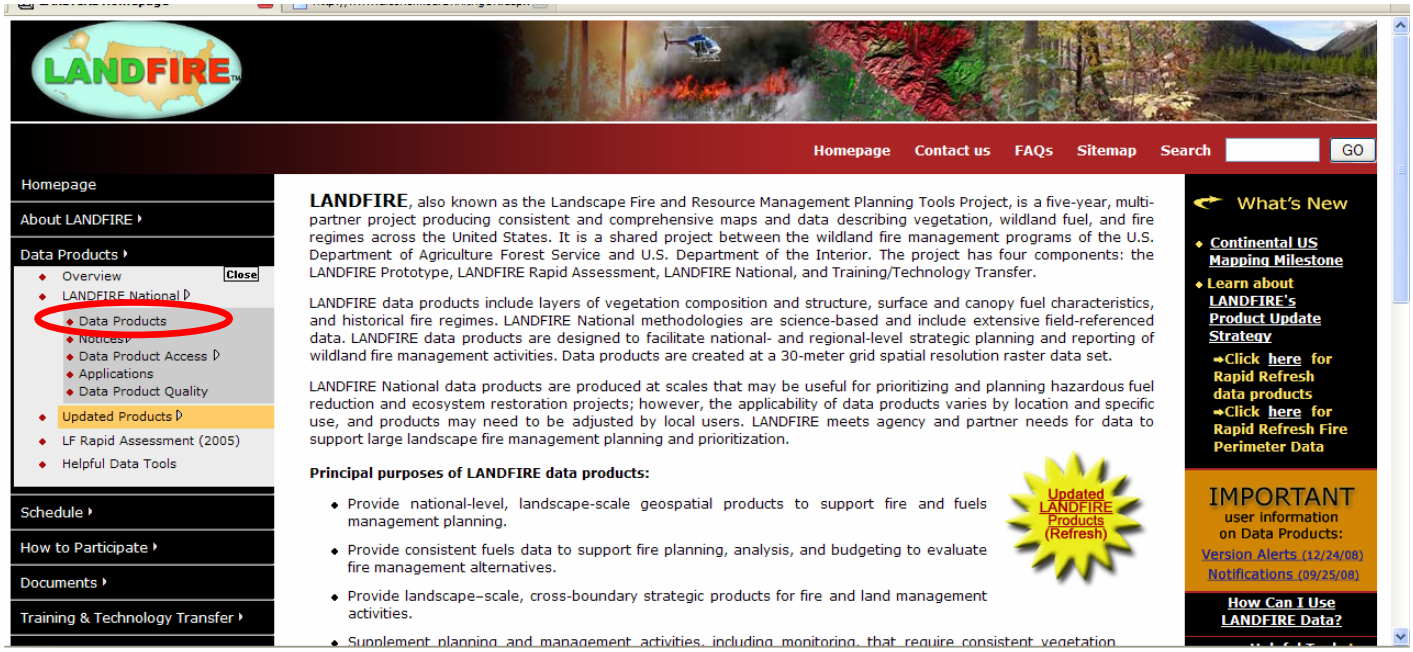
- At www.landfire.gov, notice the menu on the left side of the page. First select the *Data Products* link.

- In the sub-menu, select LANDFIRE National. Before proceeding, notice that this menu also contains a LANDFIRE Rapid Assessment option. The Rapid Assessment models were posted in 2005. However, we recommend working with the LANDFIRE National models as they are more refined than the Rapid Assessment models, and the LANDFIRE National models are compatible with the other LANDFIRE National products.

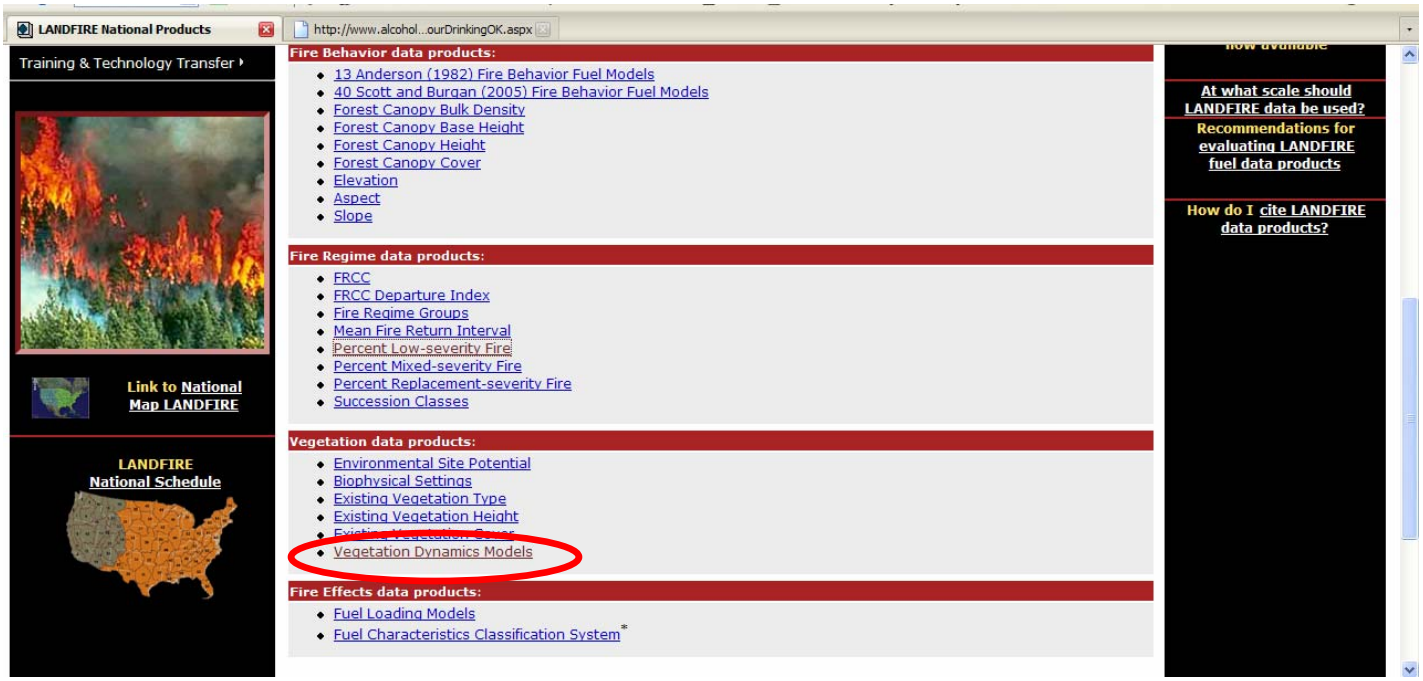
  In addition, we recommend that at some point you explore the other items in the menu on www.landfire.gov for information on the LANDFIRE Project

and its various products.

- After clicking on the LANDFIRE National link, a gray sub-menu appears with several more links. (Later on, we recommend that you explore some of these other links to learn more about LANDFIRE's various products). Now select the Data Products link in the sub-menu as the next step in the model downloading process, as shown below:



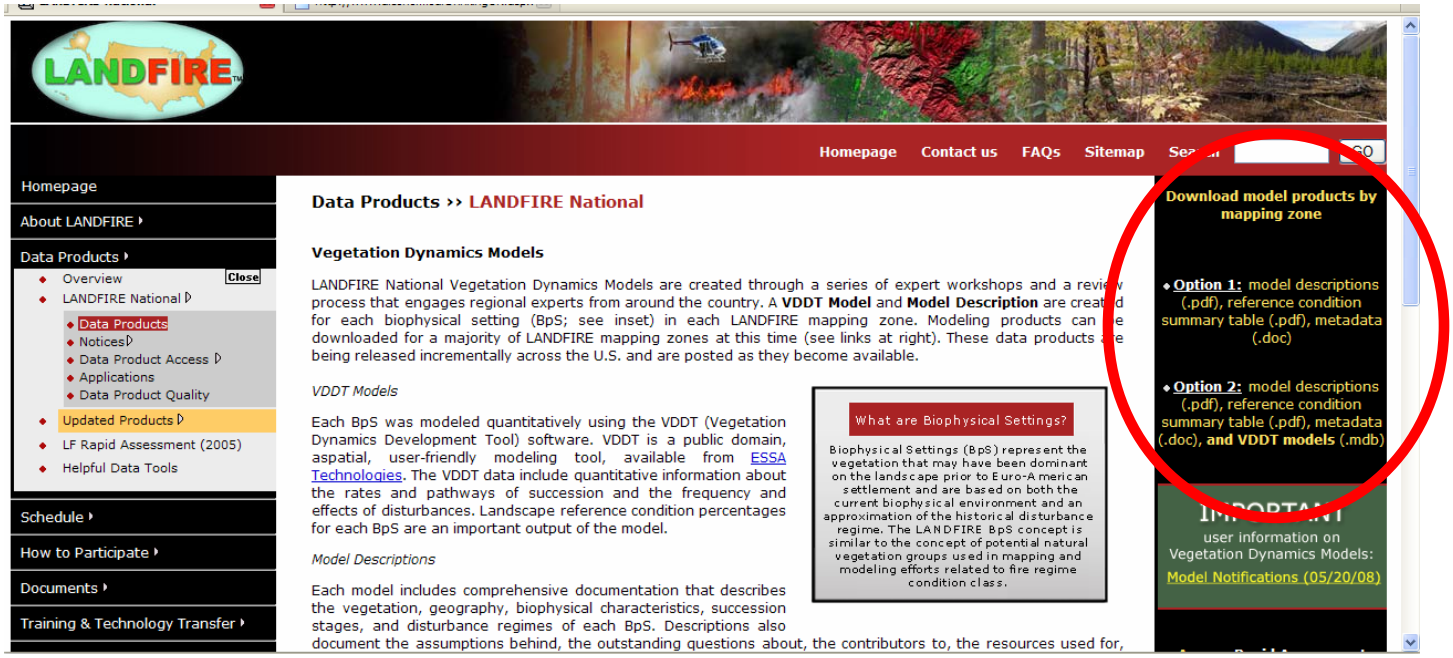
- Clicking on Data Products in the sub-menu takes you to the LANDFIRE National Data Products page. Scroll down to the list of products, as shown below. These links take you to descriptions and example maps of the various data products. Again, we recommend that you later explore this page and the rest of the LANDFIRE website.



- As shown in the above image, click on the Vegetation Dynamics Models, a.k.a. the LANDFIRE Biophysical Setting Models. You'll see that there's a link to these models in the right column of this page, as well.

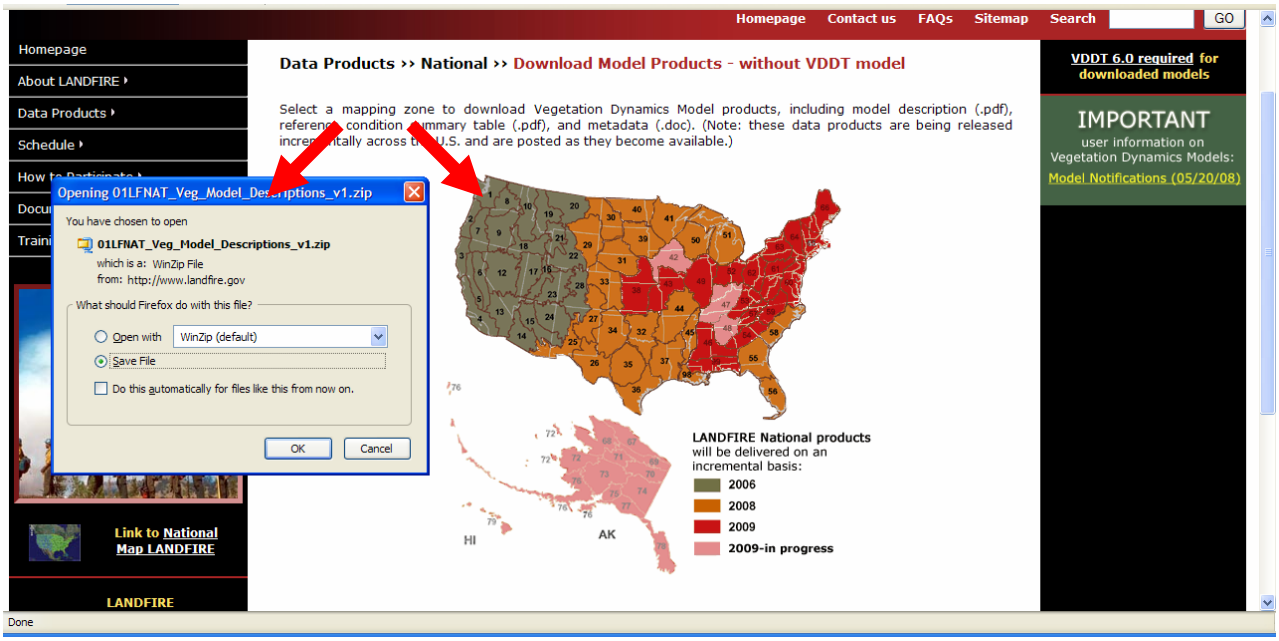
- You're now taken to the Vegetation Dynamics Models page that you read earlier. First, notice the green box on the right side of the page. These Model Notifications explain various issues with the models that have been identified and they inform the user how to better use them. Before you use a model, it is important to check these notifications to make sure no unresolved problems have been identified for that model. Now, focus on the upper right portion of the page, as shown in the image below. The first thing to notice is that the data products are delivered according to each of LANDFIRE's seventy-nine mapping zones. In a moment, we'll proceed to the interactive map that is used for selecting the models for a given zone. Next, notice that the page provides two download options: Option 1, which is what we'll work with in this document, provides the model descriptions, an associated summary table, and metadata; Option 2 provides

the same items plus copies of the actual VDDT models that were developed during the numerous modeling workshops. You would select Option 2 when you want to investigate the models more thoroughly or use a LANDFIRE VDDT model as a starting point for your own modeling project.



- Clicking on Option 1 takes you to the interactive modeling zone map, as shown below. Notice that data for all zones in the lower 48 states are currently available. Data for zones in Alaska and Hawaii are scheduled to be available by fall 2009.

- We'll be using Zone 1 in the Pacific Northwest for our example. Click in Zone 1 to activate the file download dialog box and download the zip file to an appropriately named folder, such as "LF Z1 Descriptions." The zip file contains 3 files: the model description, which we discussed above, and two additional files: a reference condition summary table and a metadata file, which will both be discussed below.



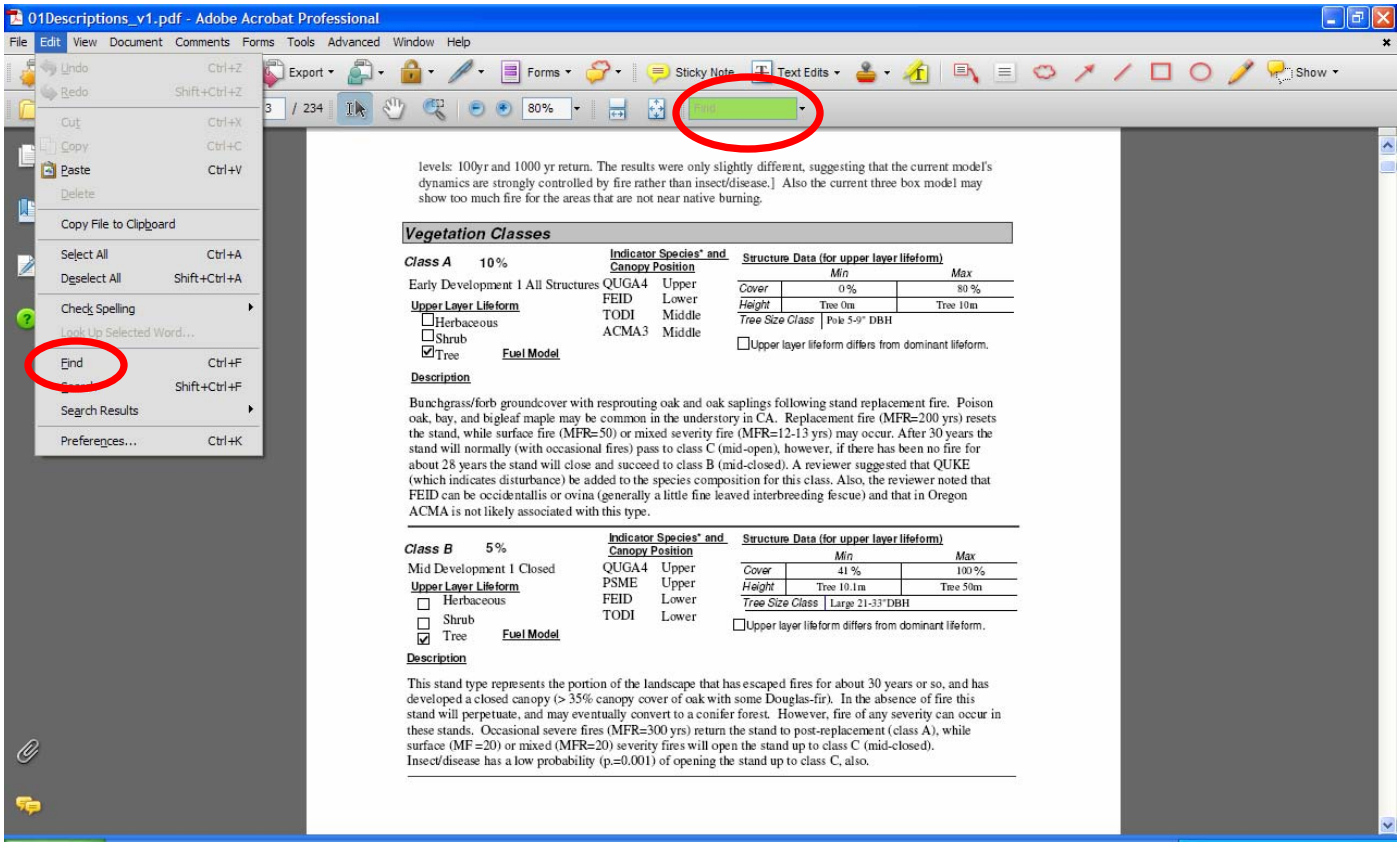
- Now that you've learned how to obtain the BpS descriptions from the LANDFIRE website, we'll discuss the model descriptions themselves.

5. Understanding the Model Descriptions

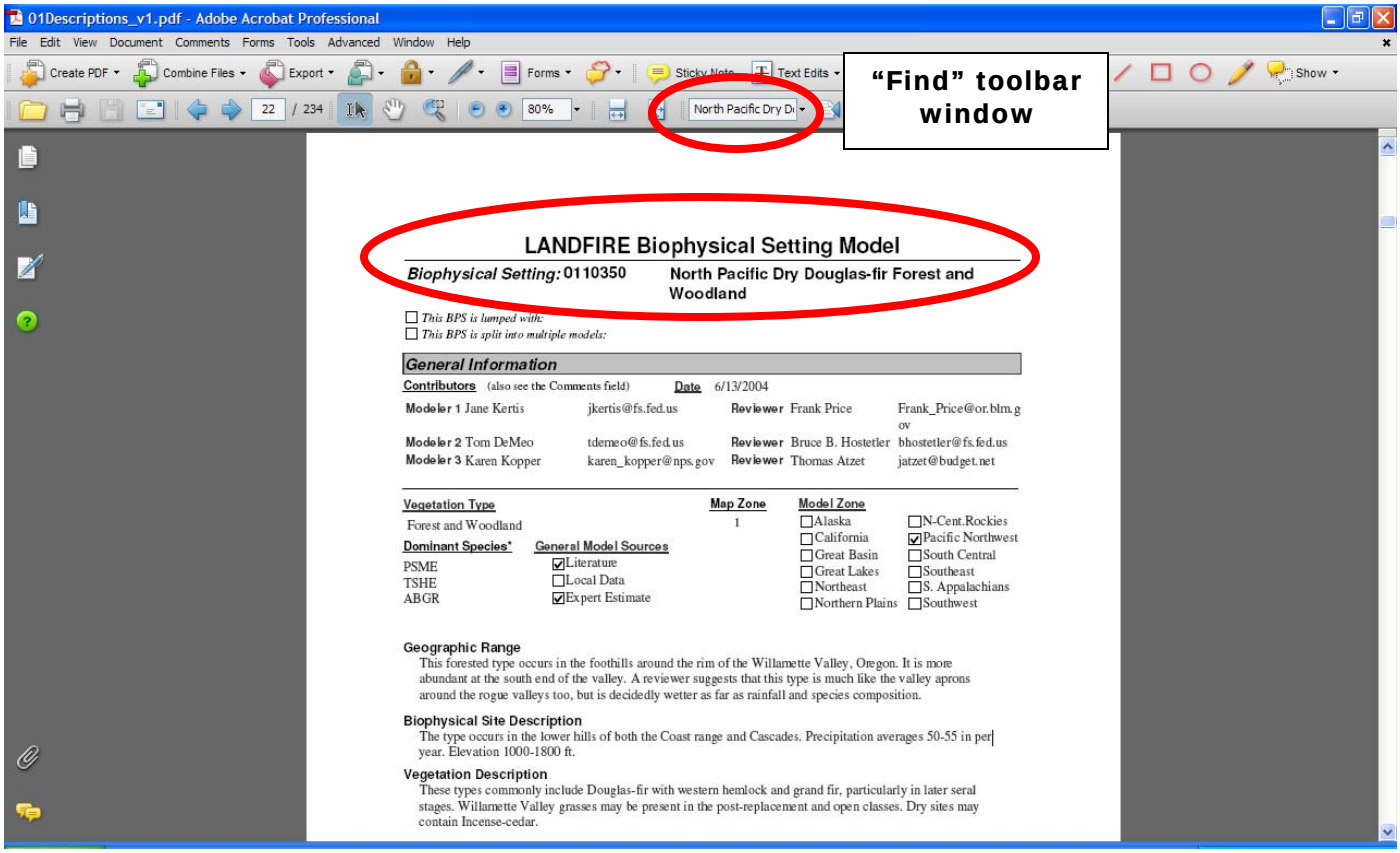
5.1 Overview

In this section, we'll explore the BpS model description that you downloaded from www.landfire.gov. We'll examine each part of the description to see some example data.

Note that this 234-page long PDF document contains descriptions for forty-nine BpS models. So, how does one navigate efficiently within this large document? Rather than scrolling page-by-page searching for a given model, you can use Adobe's *Find* toolbar at the top of the page or the Windows *Find* tool (in the Edit drop-down menu), both of which are shown below:



Let's say you've been working on a landscape planning project and you want to learn more about the area's Douglas-fir BpS. And, after consulting your Geographic Information System you've learned that the applicable BpS model is the *North Pacific Dry Douglas-fir Forest and Woodland*, which is model number 0110350. To quickly locate that model in the PDF document, simply type the model name or number into the *Find* toolbar window and press *Enter* to locate the model, as shown below. (Note: if you would like to learn more about the LANDFIRE BpS layer, visit the Data Products > LANDFIRE National section of www.landfire.gov for details.)



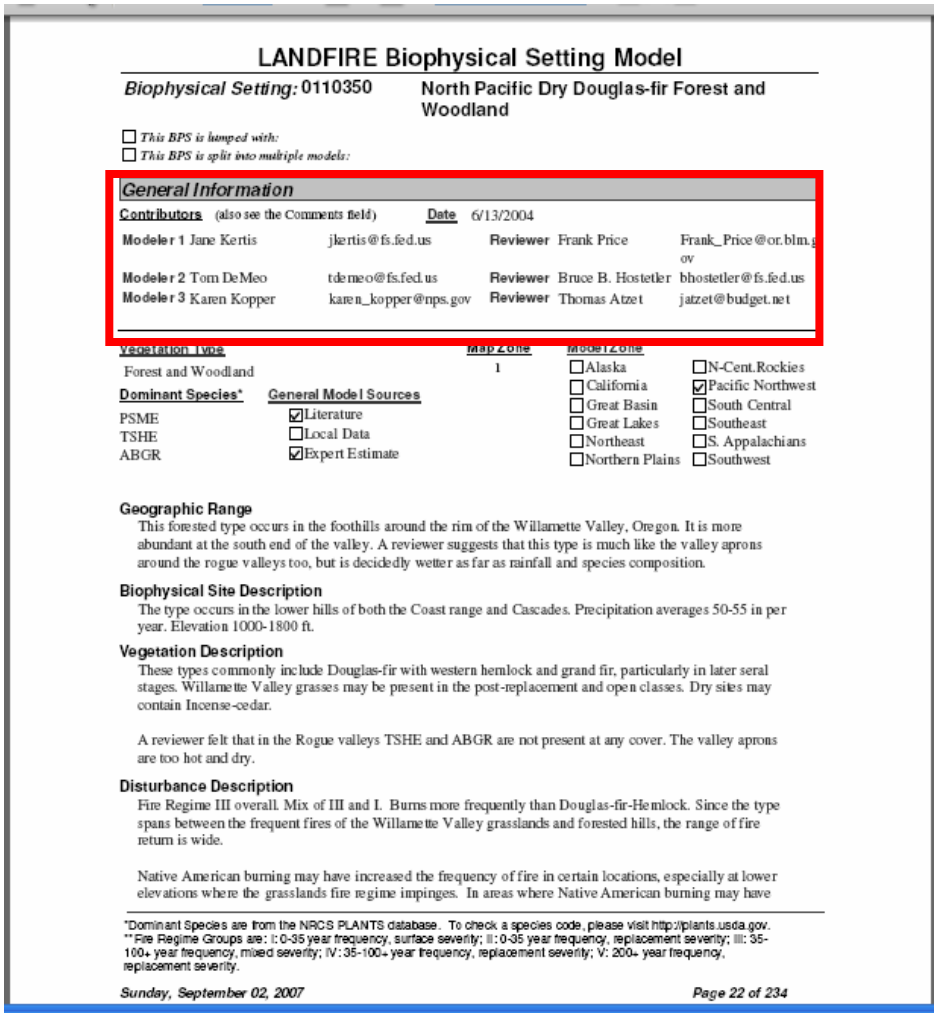
Now that we've found our model description, which is on page 22, we can begin reviewing the main elements of the Dry Douglas-fir BpS model description.

For learning efficiency, we recommend that you print the *North Pacific Dry Douglas-fir Forest and Woodland* BpS model description, which ranges from pages 22 – 25, and refer to your printed version as you work through this guide.

5.2 General Information Section

Now we'll review the first two pages of the description, which provide a general overview of the BpS. The first part, outlined in red below, shows the BpS name, model number, date, modeler names, and model reviewers. This information serves to document who did the modeling and who provided peer review

comments to improve the final product. In addition, you can use this information to contact the modeler if you have concerns or questions about a given BpS model.



LANDFIRE Biophysical Setting Model

Biophysical Setting: 0110350 North Pacific Dry Douglas-fir Forest and Woodland

☐ *This BPS is lumped with:*
☐ *This BPS is split into multiple models:*

General Information

Contributors (also see the Comments field) Date 6/13/2004

Modeler 1 Jane Kertis	jkertis@fs.fed.us	Reviewer	Frank Price	Frank_Price@or.blm.gov
Modeler 2 Tom DeMeo	tdemeo@fs.fed.us	Reviewer	Bruce B. Hostetler	bhostetler@fs.fed.us
Modeler 3 Karen Kopper	karen_kopper@nps.gov	Reviewer	Thomas Atzet	jatzet@budget.net

Vegetation Type: Forest and Woodland

Map Zone: 1

Model Zone: ☐Alaska ☐California ☐Great Basin ☐Great Lakes ☐Northeast ☐Northern Plains ☐N-Cent.Rockies ☑Pacific Northwest ☐South Central ☐Southeast ☐S. Appalachians ☐Southwest

Dominant Species*: PSME, TSHE, ABGR

General Model Sources: ☑Literature ☐Local Data ☑Expert Estimate

Geographic Range

This forested type occurs in the foothills around the rim of the Willamette Valley, Oregon. It is more abundant at the south end of the valley. A reviewer suggests that this type is much like the valley aprons around the rogue valleys too, but is decidedly wetter as far as rainfall and species composition.

Biophysical Site Description

The type occurs in the lower hills of both the Coast range and Cascades. Precipitation averages 50-55 in per year. Elevation 1000-1800 ft.

Vegetation Description

These types commonly include Douglas-fir with western hemlock and grand fir, particularly in later seral stages. Willamette Valley grasses may be present in the post-replacement and open classes. Dry sites may contain Incense-cedar.

A reviewer felt that in the Rogue valleys TSHE and ABGR are not present at any cover. The valley aprons are too hot and dry.

Disturbance Description

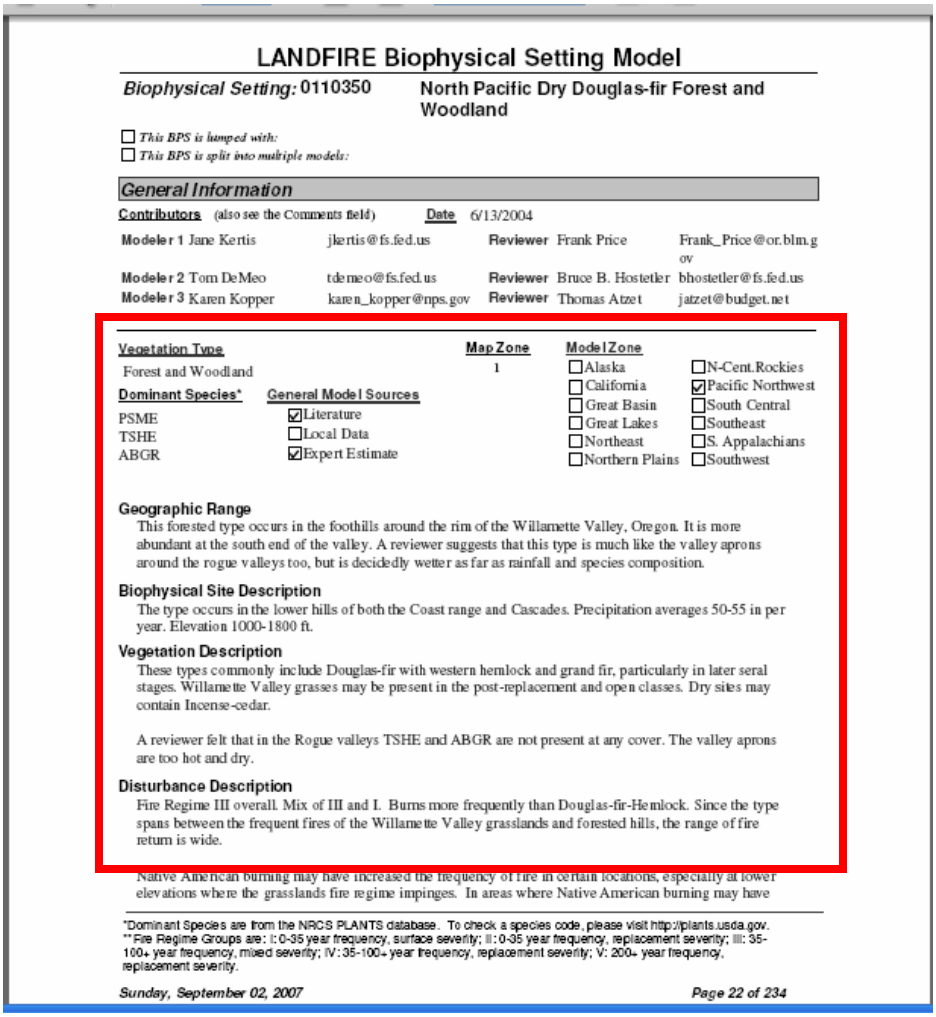
Fire Regime III overall. Mix of III and I. Burns more frequently than Douglas-fir-Hemlock. Since the type spans between the frequent fires of the Willamette Valley grasslands and forested hills, the range of fire return is wide.

Native American burning may have increased the frequency of fire in certain locations, especially at lower elevations where the grasslands fire regime impinges. In areas where Native American burning may have

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
** Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Sunday, September 02, 2007 *Page 22 of 234*

The next section lists the dominant vegetation species, followed by discussions of the geographic range, biophysical site vegetation and disturbance descriptions.



LANDFIRE Biophysical Setting Model

Biophysical Setting: 0110350 North Pacific Dry Douglas-fir Forest and Woodland

☐ *This BPS is lumped with:*
☐ *This BPS is split into multiple models:*

General Information

Contributors (also see the Comments field) Date 6/13/2004

Modeler 1	Jane Kertis	jkertis@fs.fed.us	Reviewer Frank Price	Frank_Price@or.blm.gov
Modeler 2	Tom DeMeo	tdemeo@fs.fed.us	Reviewer Bruce B. Hostetler	bhostetler@fs.fed.us
Modeler 3	Karen Kopper	karen_kopper@nps.gov	Reviewer Thomas Atzet	jatzet@budget.net

Vegetation Type
Forest and Woodland

Map Zone
1

Model Zone
☐ Alaska ☐ N-Cent.Rockies
☐ California ☑ Pacific Northwest
☐ Great Basin ☐ South Central
☐ Great Lakes ☐ Southeast
☐ Northeast ☐ S. Appalachians
☐ Northern Plains ☐ Southwest

Dominant Species*
PSME
TSHE
ABGR

General Model Sources
☑ Literature
☐ Local Data
☑ Expert Estimate

Geographic Range
This forested type occurs in the foothills around the rim of the Willamette Valley, Oregon. It is more abundant at the south end of the valley. A reviewer suggests that this type is much like the valley aprons around the rogue valleys too, but is decidedly wetter as far as rainfall and species composition.

Biophysical Site Description
The type occurs in the lower hills of both the Coast range and Cascades. Precipitation averages 50-55 in per year. Elevation 1000-1800 ft.

Vegetation Description
These types commonly include Douglas-fir with western hemlock and grand fir, particularly in later seral stages. Willamette Valley grasses may be present in the post-replacement and open classes. Dry sites may contain Incense-cedar.

A reviewer felt that in the Rogue valleys TSHE and ABGR are not present at any cover. The valley aprons are too hot and dry.

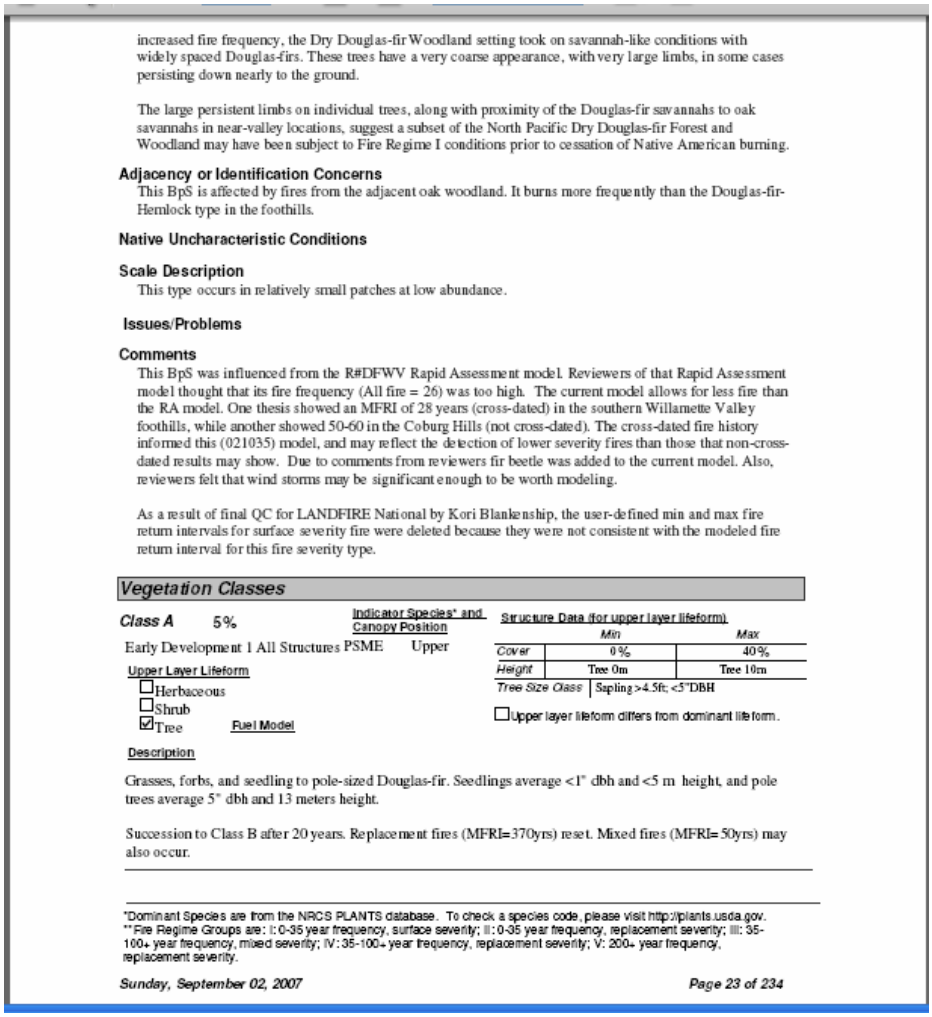
Disturbance Description
Fire Regime III overall. Mix of III and I. Burns more frequently than Douglas-fir-Hemlock. Since the type spans between the frequent fires of the Willamette Valley grasslands and forested hills, the range of fire return is wide.

Native American burning may have increased the frequency of fire in certain locations, especially at lower elevations where the grasslands fire regime impinges. In areas where Native American burning may have

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Sunday, September 02, 2007 *Page 22 of 234*

The general information about the BpS continues on the second page. Notice the sections describing BpS adjacency concerns, native uncharacteristic conditions, the scale description, the section provided for recording any issues or problems (none were recorded for this model description), and the section provided for general comments. You should always review the comments section because the modelers often include additional information, such as when two similar models in adjacent zones have unresolved differences for some BpS traits.



increased fire frequency, the Dry Douglas-fir Woodland setting took on savannah-like conditions with widely spaced Douglas-firs. These trees have a very coarse appearance, with very large limbs, in some cases persisting down nearly to the ground.

The large persistent limbs on individual trees, along with proximity of the Douglas-fir savannahs to oak savannahs in near-valley locations, suggest a subset of the North Pacific Dry Douglas-fir Forest and Woodland may have been subject to Fire Regime I conditions prior to cessation of Native American burning.

Adjacency or Identification Concerns

This BpS is affected by fires from the adjacent oak woodland. It burns more frequently than the Douglas-fir-Hemlock type in the foothills.

Native Uncharacteristic Conditions

Scale Description

This type occurs in relatively small patches at low abundance.

Issues/Problems

Comments

This BpS was influenced from the R#DFWV Rapid Assessment model. Reviewers of that Rapid Assessment model thought that its fire frequency (All fire = 26) was too high. The current model allows for less fire than the RA model. One thesis showed an MFRI of 28 years (cross-dated) in the southern Willamette Valley foothills, while another showed 50-60 in the Coburg Hills (not cross-dated). The cross-dated fire history informed this (021035) model, and may reflect the detection of lower severity fires than those that non-cross-dated results may show. Due to comments from reviewers fir beetle was added to the current model. Also, reviewers felt that wind storms may be significant enough to be worth modeling.

As a result of final QC for LANDFIRE National by Kori Blankenship, the user-defined min and max fire return intervals for surface severity fire were deleted because they were not consistent with the modeled fire return interval for this fire severity type.

Vegetation Classes

Class A 5%

Indicator Species* and Canopy Position

Early Development 1 All Structures PSME Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0%	40%
Height	Tree 0m	Tree 10m
Tree Size Class	Sapling>4.5ft; <5"DBH	

Upper layer lifeform differs from dominant lifeform.

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model

Description

Grasses, forbs, and seedling to pole-sized Douglas-fir. Seedlings average <1" dbh and <5 m height, and pole trees average 5" dbh and 13 meters height.

Succession to Class B after 20 years. Replacement fires (MFRI=370yrs) reset. Mixed fires (MFRI= 50yrs) may also occur.

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Sunday, September 02, 2007 *Page 23 of 234*

5.3 Vegetation Classes Description

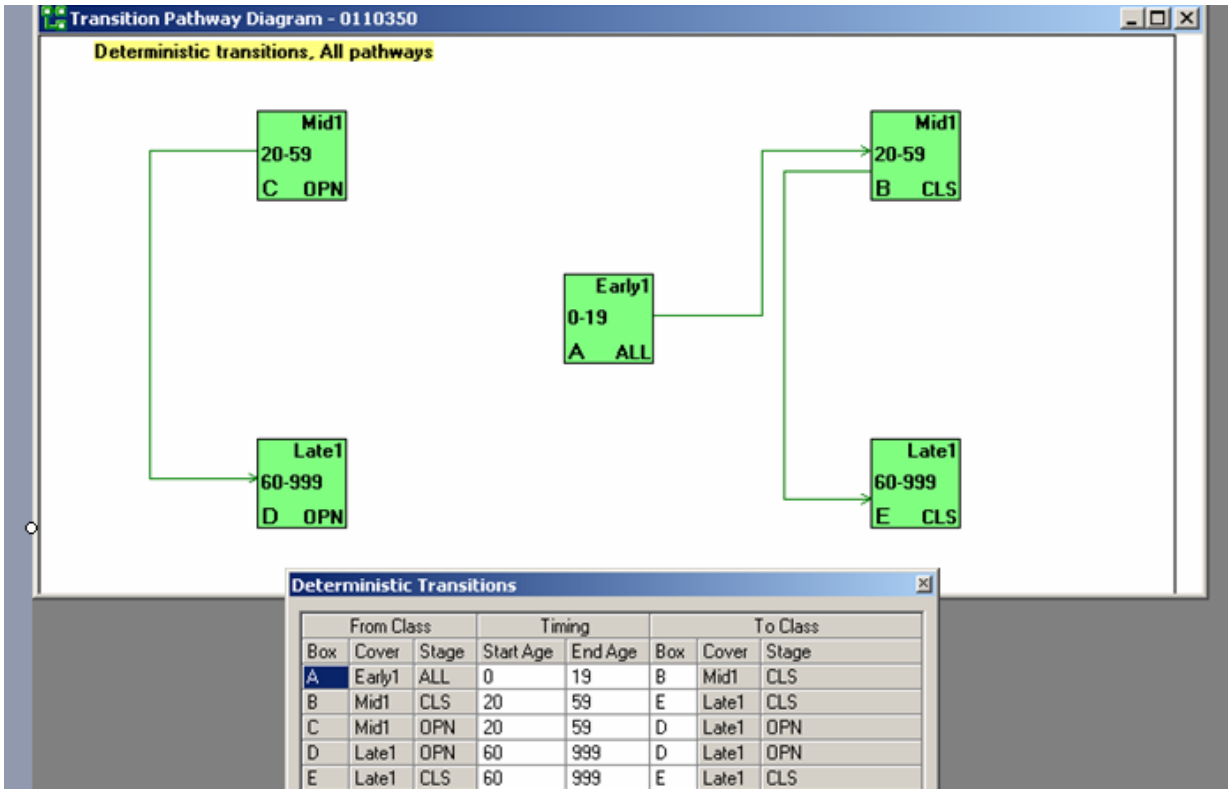
Now let's review the next section, which describes the Vegetation Classes – also known as Succession Classes or S-Classes for short. This section of the description, which ranges from page 22 to page 25, describes not only how many S-Classes were used to characterize this BpS, but also the general descriptive traits and the estimated mean percent of the BpS occupied on the landscape by each S-Class historically. Note that both standard and custom frameworks were used for describing BpS succession classes during the LANDFIRE modeling. For example, modelers often used the five standard succession classes defined by the FRCC Guidebook (Hann and others [2008] at www.frcc.gov), which range from early

open-canopy to late closed-canopy successional stages. However, because modelers sometimes chose to diverge from that standard framework, each succession class description should be carefully scrutinized before using the information.

Please review the succession class descriptions in your example BpS before proceeding. Note that we'll explain how the estimated S-Class percentages were derived when you finish reading that section.

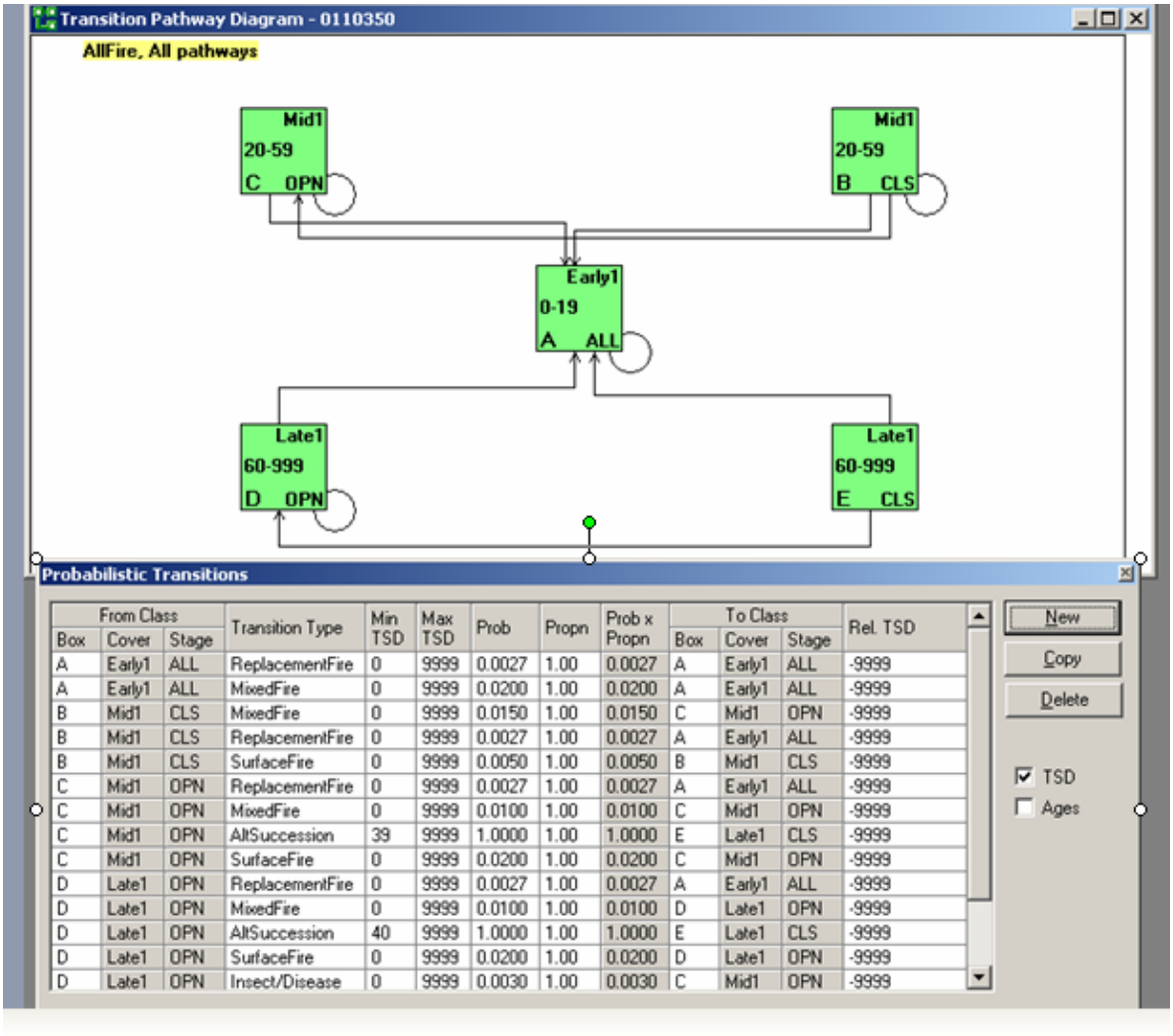
OK, now that you've read about the vegetation classes, let's look at how those S-Classes and their estimated percents were derived. As you read about on the landfire.gov website earlier, each BpS was modeled quantitatively, using software called the Vegetation Dynamics Development Tool (VDDT). In short, the LANDFIRE modeling produced quantitative data describing the rates and pathways of succession and the frequency and effects of various types of disturbances. Expert modelers documented not only the descriptive traits for each S-Class, but they also had to "attribute" the VDDT software to develop the parameters for simulating the S-Class percentages.

Specifically, the modelers who developed the *North Pacific Dry Douglas-fir Forest and Woodland* BpS model used available literature and expert opinion to estimate the succession pathways first without any disturbance. Next, the modelers added in the natural disturbance processes such as fire (surface, mixed, and replacement severity types), insect and disease, wind, and flooding. The graphic below shows the succession pathways as indicated by arrows and the associated transition rates, in years, in the absence of disturbance. Notice, for example, that early succession Class A (labeled "Box A" in the table) progresses to the densely vegetated ("Closed" [CLS]) S-Class B after 19 years in the absence of disturbance.



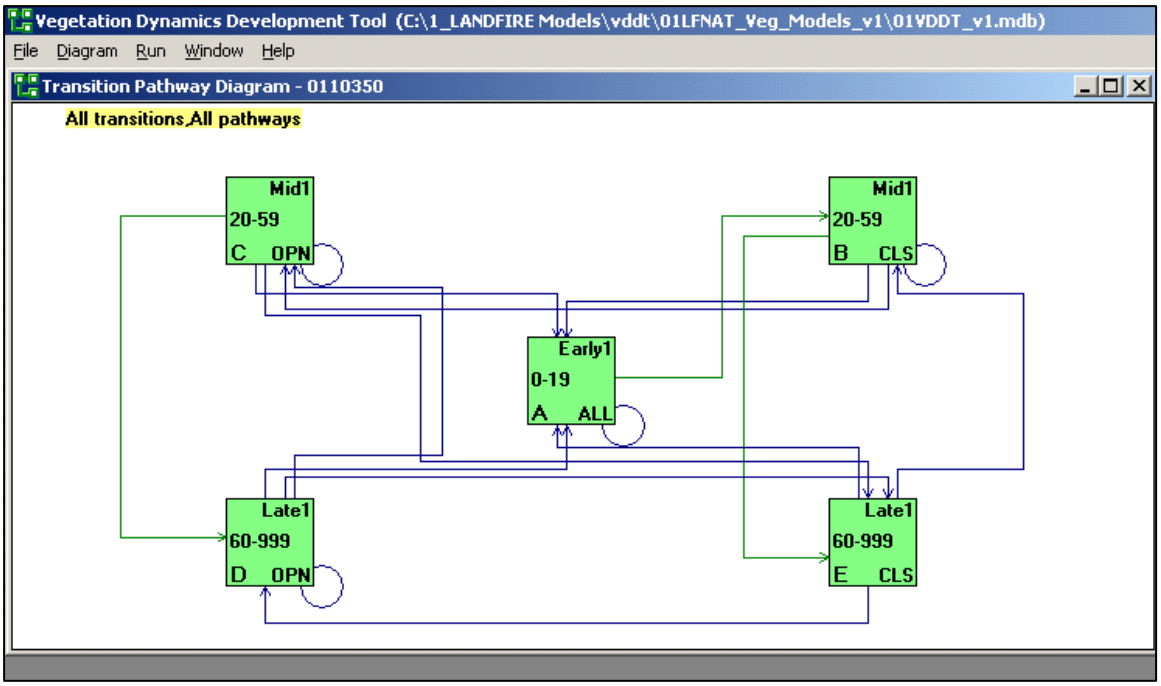
From Class			Timing		To Class		
Box	Cover	Stage	Start Age	End Age	Box	Cover	Stage
A	Early1	ALL	0	19	B	Mid1	CLS
B	Mid1	CLS	20	59	E	Late1	CLS
C	Mid1	OPN	20	59	D	Late1	OPN
D	Late1	OPN	60	999	D	Late1	OPN
E	Late1	CLS	60	999	E	Late1	CLS

Next, the modelers input their estimates of various disturbance types and their frequency probabilities, as well as the associated succession pathways after those disturbances. Notice that the array of disturbance pathways below is substantially more complex when compared to the non-disturbance pathways in the graphic above. Although a mixed-severity fire frequency of 36 years was used for the BpS as a whole, note that the modelers used widely varying fire severities and frequencies for the individual S-Classes. For example, the first row in the data table below shows a replacement-fire probability for S-Class A of just .0027 – which translates into a fire frequency of about 370 years.



From Class			Transition Type	Min TSD	Max TSD	Prob	Propn	Prob x Propn	To Class			Rel. TSD
Box	Cover	Stage							Box	Cover	Stage	
A	Early1	ALL	ReplacementFire	0	9999	0.0027	1.00	0.0027	A	Early1	ALL	-9999
A	Early1	ALL	MixedFire	0	9999	0.0200	1.00	0.0200	A	Early1	ALL	-9999
B	Mid1	CLS	MixedFire	0	9999	0.0150	1.00	0.0150	C	Mid1	OPN	-9999
B	Mid1	CLS	ReplacementFire	0	9999	0.0027	1.00	0.0027	A	Early1	ALL	-9999
B	Mid1	CLS	SurfaceFire	0	9999	0.0050	1.00	0.0050	B	Mid1	CLS	-9999
C	Mid1	OPN	ReplacementFire	0	9999	0.0027	1.00	0.0027	A	Early1	ALL	-9999
C	Mid1	OPN	MixedFire	0	9999	0.0100	1.00	0.0100	C	Mid1	OPN	-9999
C	Mid1	OPN	AltSuccession	39	9999	1.0000	1.00	1.0000	E	Late1	CLS	-9999
C	Mid1	OPN	SurfaceFire	0	9999	0.0200	1.00	0.0200	C	Mid1	OPN	-9999
D	Late1	OPN	ReplacementFire	0	9999	0.0027	1.00	0.0027	A	Early1	ALL	-9999
D	Late1	OPN	MixedFire	0	9999	0.0100	1.00	0.0100	D	Late1	OPN	-9999
D	Late1	OPN	AltSuccession	40	9999	1.0000	1.00	1.0000	E	Late1	CLS	-9999
D	Late1	OPN	SurfaceFire	0	9999	0.0200	1.00	0.0200	D	Late1	OPN	-9999
D	Late1	OPN	Insect/Disease	0	9999	0.0030	1.00	0.0030	C	Mid1	OPN	-9999

Once all of the attributing had been completed, the modelers ran the software. VDDT conducts multiple non-spatial simulations for 1000-year spans based on the inputs for successional pathways relative to estimated disturbance types and frequencies. The end result, as you saw in the written description, is a mean percentage estimate for each S-Class historically. As you can see from the graphic below, the VDDT modeling produced a complex array of succession classes and successional pathways for this BpS. Note again that the green arrows indicate succession pathways in the absence of disturbance, whereas the blue arrows show the post-disturbance pathways.

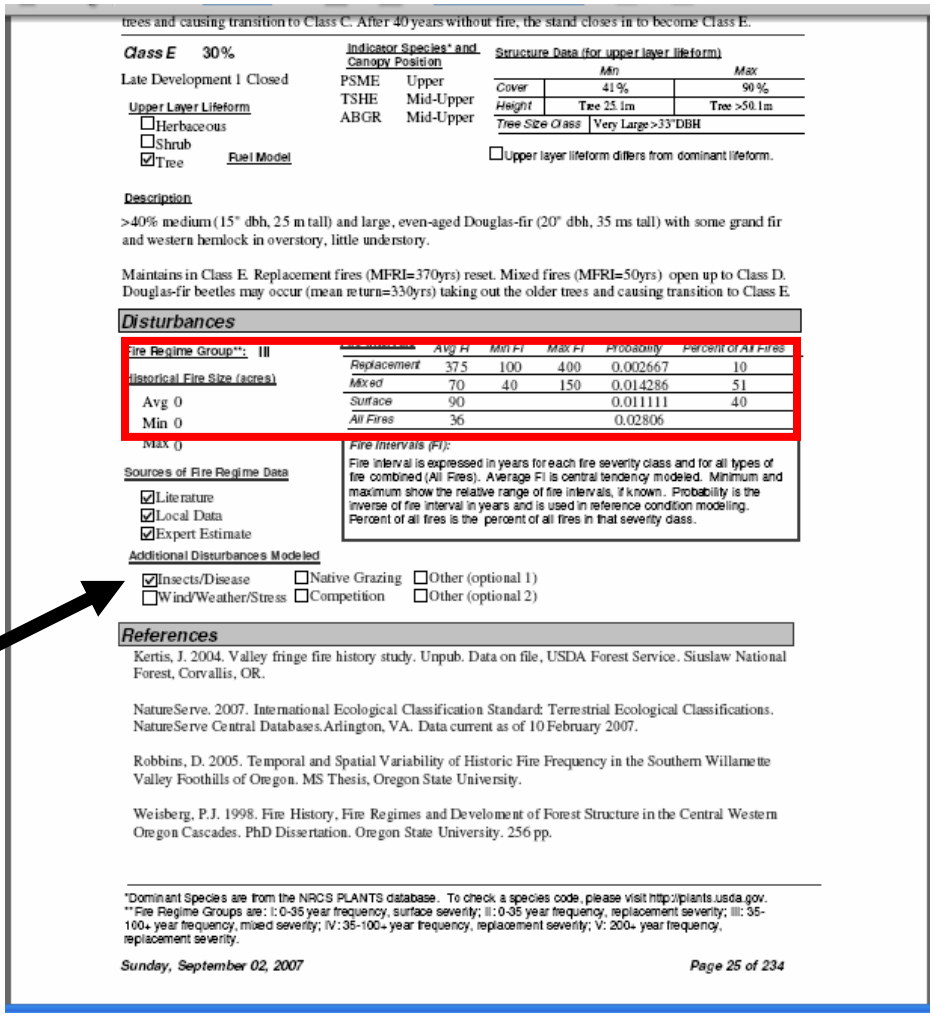


(For more information about VDDT and associated training opportunities, visit the ESSA Technologies website at http://www.essa.com/services/forestry/training.htm.)

5.4 Disturbances Section

The next portion of the BpS description documents the various disturbance types. As you can see from the graphic below, the description lists the specific fire severity types (replacement, mixed, surface) and associated frequencies that were used for the VDDT modeling. Also notice the fire regime group (FRG), which is classified based on the overall fire frequency and the dominant fire severity type (Hann and others 2008). In addition, the range of historical fire sizes were recorded whenever such estimates were possible. Also notice the estimated fire intervals for the three fire severity types (*Avg FI*, *Min FI*, *Max FI* columns) and the overall fire frequency listed in the *All Fires* row. (Note: To convert the table's fire probabilities into fire frequency, simply divide the integer 1 by the probability value; for example, 1 divided by the .02806 probability value shown in the *All Fires* row yields a 35.64 year fire frequency). As for the other disturbance types, notice that a check was placed

in the Insects/Disease box, indicating that those disturbance types were also used to develop the model.



trees and causing transition to Class C. After 40 years without fire, the stand closes in to become Class E.

Class E 30%

Late Development 1 Closed

Upper Layer Lifeform
- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

Indicator Species* and Canopy Position

PSME	Upper
TSHE	Mid-Upper
ABGR	Mid-Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	41%	90%
Height	Tree 25.1m	Tree >50.1m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

>40% medium (15" dbh, 25 m tall) and large, even-aged Douglas-fir (20" dbh, 35 ms tall) with some grand fir and western hemlock in overstory, little understory.

Maintains in Class E. Replacement fires (MFRI=370yrs) reset. Mixed fires (MFRI=50yrs) open up to Class D. Douglas-fir beetles may occur (mean return=330yrs) taking out the older trees and causing transition to Class E.

Disturbances

Fire Regime Group**: III

Historical Fire Size (acres)

Avg 0
Min 0
Max 0

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	375	100	400	0.002667	10
Mixed	70	40	150	0.014286	51
Surface	90			0.011111	40
All Fires	36			0.02806	

Fire Intervals (FI):

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class.

Sources of Fire Regime Data
- ☑ Literature
- ☑ Local Data
- ☑ Expert Estimate

Additional Disturbances Modeled
- ☑ Insects/Disease
- ☐ Wind/Weather/Stress
- ☐ Native Grazing
- ☐ Competition
- ☐ Other (optional 1)
- ☐ Other (optional 2)

References

Kertis, J. 2004. Valley fringe fire history study. Unpub. Data on file, USDA Forest Service. Siuslaw National Forest, Corvallis, OR.

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

Robbins, D. 2005. Temporal and Spatial Variability of Historic Fire Frequency in the Southern Willamette Valley Foothills of Oregon. MS Thesis, Oregon State University.

Weisberg, P.J. 1998. Fire History, Fire Regimes and Develoment of Forest Structure in the Central Western Oregon Cascades. PhD Dissertation. Oregon State University. 256 pp.

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

5.5 References Section

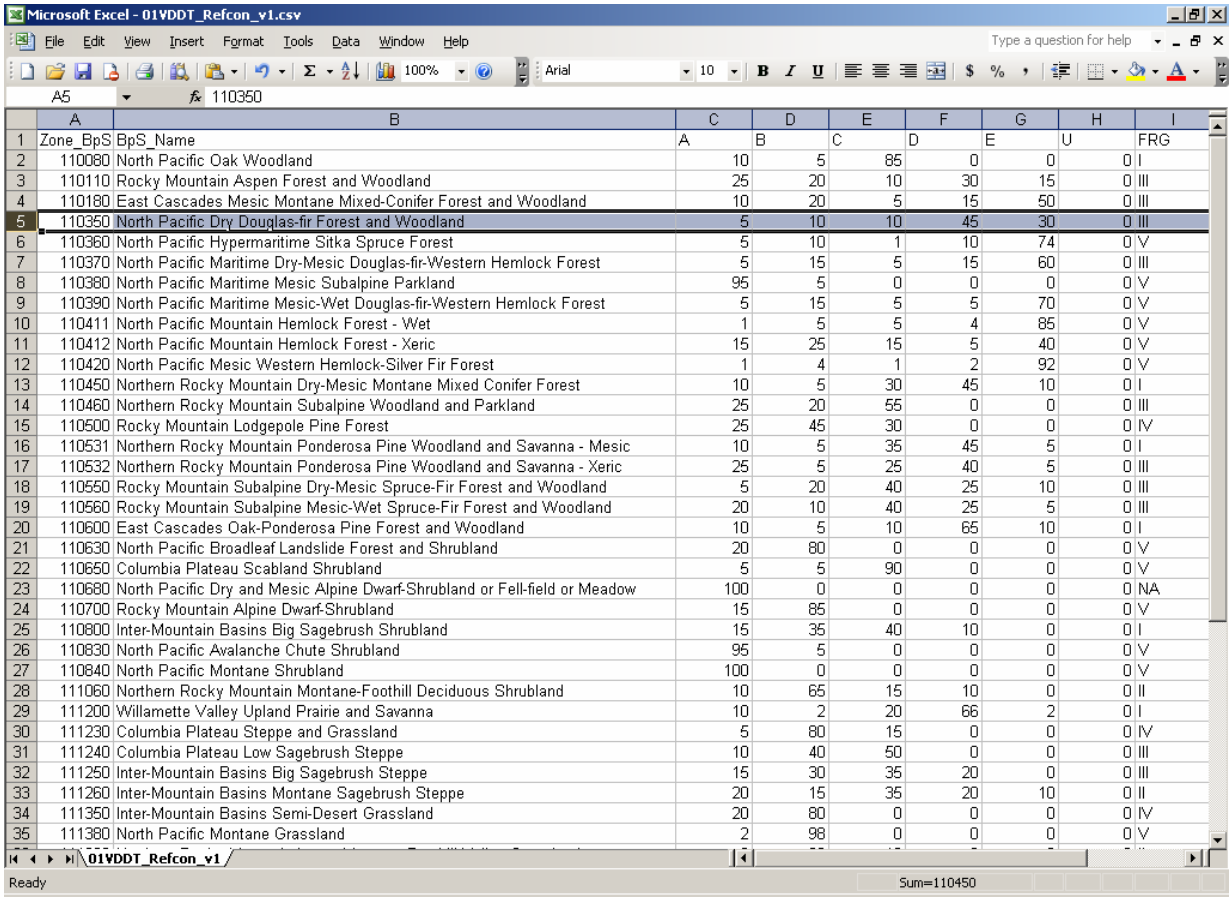
The final part of the BpS description lists the literature that was used during the modeling. Note that this listing doesn't necessarily reflect a comprehensive literature search. Rather, the references section merely shows publications that the modelers felt provided the most useful data for modeling purposes.

6. Ancillary Files

6.1 Reference Condition Summary Table

As mentioned, in addition to the BpS descriptions, LANDFIRE also provides a convenient table in the zip file you downloaded earlier. This Excel spreadsheet can serve as a convenient lookup table because it summarizes the major data elements that you just reviewed in the BpS description. Despite a rather cryptic file name (01VDDT_Refcon_v1.csv), the spreadsheet is simply known as the Reference Condition Summary Table.

Note that one table exists for each mapping zone in the U.S. Therefore, users must either scroll through the table or use the *Find* tool to locate a given BpS. For instance, row 5 in the graphic below summarizes the values for our example Douglas-fir BpS. As you can see, the table begins by listing the BpS code and then the model name. The next five columns list the estimated percentages for the various S-Classes (classes A through E). The next column is labeled U, which refers to uncharacteristic S-classes. (Although uncharacteristic S-Classes did not occur historically, that category can be useful for documenting current landscape conditions). And, finally, the far-right column that is labeled *FRG* lists the dominant fire regime group for the BpS.



Microsoft Excel - 01VDDT_Refcon_v1.csv

File Edit View Insert Format Tools Data Window Help

A5 110350

	A	B	C	D	E	F	G	H	I
1	Zone_BpS	BpS_Name	A	B	C	D	E	U	FRG
2	110080	North Pacific Oak Woodland	10	5	85	0	0	0	I
3	110110	Rocky Mountain Aspen Forest and Woodland	25	20	10	30	15	0	III
4	110180	East Cascades Mesic Montane Mixed-Conifer Forest and Woodland	10	20	5	15	50	0	III
5	110350	North Pacific Dry Douglas-fir Forest and Woodland	5	10	10	45	30	0	III
6	110360	North Pacific Hypermaritime Sitka Spruce Forest	5	10	1	10	74	0	V
7	110370	North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest	5	15	5	15	60	0	III
8	110380	North Pacific Maritime Mesic Subalpine Parkland	95	5	0	0	0	0	V
9	110390	North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest	5	15	5	5	70	0	V
10	110411	North Pacific Mountain Hemlock Forest - Wet	1	5	5	4	85	0	V
11	110412	North Pacific Mountain Hemlock Forest - Xeric	15	25	15	5	40	0	V
12	110420	North Pacific Mesic Western Hemlock-Silver Fir Forest	1	4	1	2	92	0	V
13	110450	Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	10	5	30	45	10	0	I
14	110460	Northern Rocky Mountain Subalpine Woodland and Parkland	25	20	55	0	0	0	III
15	110500	Rocky Mountain Lodgepole Pine Forest	25	45	30	0	0	0	IV
16	110531	Northern Rocky Mountain Ponderosa Pine Woodland and Savanna - Mesic	10	5	35	45	5	0	I
17	110532	Northern Rocky Mountain Ponderosa Pine Woodland and Savanna - Xeric	25	5	25	40	5	0	III
18	110550	Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	5	20	40	25	10	0	III
19	110560	Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland	20	10	40	25	5	0	III
20	110600	East Cascades Oak-Ponderosa Pine Forest and Woodland	10	5	10	65	10	0	I
21	110630	North Pacific Broadleaf Landslide Forest and Shrubland	20	80	0	0	0	0	V
22	110650	Columbia Plateau Scabland Shrubland	5	5	90	0	0	0	V
23	110680	North Pacific Dry and Mesic Alpine Dwarf-Shrubland or Fell-field or Meadow	100	0	0	0	0	0	NA
24	110700	Rocky Mountain Alpine Dwarf-Shrubland	15	85	0	0	0	0	V
25	110800	Inter-Mountain Basins Big Sagebrush Shrubland	15	35	40	10	0	0	I
26	110830	North Pacific Avalanche Chute Shrubland	95	5	0	0	0	0	V
27	110840	North Pacific Montane Shrubland	100	0	0	0	0	0	V
28	111060	Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	10	65	15	10	0	0	II
29	111200	Willamette Valley Upland Prairie and Savanna	10	2	20	66	2	0	I
30	111230	Columbia Plateau Steppe and Grassland	5	80	15	0	0	0	IV
31	111240	Columbia Plateau Low Sagebrush Steppe	10	40	50	0	0	0	III
32	111250	Inter-Mountain Basins Big Sagebrush Steppe	15	30	35	20	0	0	III
33	111260	Inter-Mountain Basins Montane Sagebrush Steppe	20	15	35	20	10	0	II
34	111350	Inter-Mountain Basins Semi-Desert Grassland	20	80	0	0	0	0	IV
35	111380	North Pacific Montane Grassland	2	98	0	0	0	0	V

01VDDT_Refcon_v1

Ready Sum=110450

6.2 Metadata

The remaining file that downloads in the zip file with the description and the reference condition summary table contains the metadata. Metadata are the same for all mapping zones and will help you understand the characteristics of this LANDFIRE product. Please take a moment to briefly skim the metadata document to familiarize yourself with its contents.

Summary

In summary, you first learned what biophysical settings and the LANDFIRE BpS models are. You then learned the purpose of the models and associated

descriptions. We then discussed some background information regarding how they were created. After that, you learned how to obtain the models and descriptions. And finally, you learned about the various elements contained within the descriptions as well as the ancillary material that is provided with them in the downloaded zip file.

We hope you found this document informative and useful for your future work. Lastly, we welcome your comments or questions – send to helpdesk@niftt.gov.

References

Hann, W.; Shlisky, A.; Havlina, D.; Schon, K.; Barrett, S.; DeMeo, T.; Pohl, K.; Menakis, J.; Hamilton, D.; Jones, J.; Levesque, M.; Frame, C. 2004. Interagency Fire Regime Condition Class Guidebook. Last update January 2008: Version 1.3.0 [Homepage of the Interagency and The Nature Conservancy fire regime condition class website, USDA Forest Service, US Department of the Interior, The Nature Conservancy, and Systems for Environmental Management]. [Online]. Available: www.frcc.gov.