

# LANDFIRE Biophysical Setting Model

**Biophysical Setting: 0210290**

**Mediterranean California Mixed Oak 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** Edward Reilly    ereilly@blm.gov      **Reviewer** Tom Atzet      jatzet@budget.net  
**Modeler 2** Diane White      dewwhite01@fs.fed.us      **Reviewer**  
**Modeler 3** Darren Borgias    dborgias@tnc.org      **Reviewer**

<u>Vegetation Type</u>	<u>Dominant Species</u>	<u>Map Zone</u>	<u>Model Zone</u>	
Forest and Woodland	QUGA4 PIPO	2	<input type="checkbox"/> Alaska	<input type="checkbox"/> Northern Plains
<b>General Model Sources</b>	PSME TODI		<input type="checkbox"/> California	<input type="checkbox"/> N-Cent.Rockies
<input checked="" type="checkbox"/> Literature			<input type="checkbox"/> Great Basin	<input checked="" type="checkbox"/> Pacific Northwest
<input checked="" type="checkbox"/> Local Data			<input type="checkbox"/> Great Lakes	<input type="checkbox"/> South Central
<input checked="" type="checkbox"/> Expert Estimate			<input type="checkbox"/> Hawaii	<input type="checkbox"/> Southeast
			<input type="checkbox"/> Northeast	<input type="checkbox"/> S. Appalachians
				<input type="checkbox"/> Southwest

## Geographic Range

This BpS occurs in W-Orand WA, mostly in the lowlands. The Willamette Valley is the center of the range.

## Biophysical Site Description

This ecological system occurs in diverse climates, ranging from the cool, humid conditions near the coast to the hot, dry environment of inland valleys and foothill woodlands. Slopes may be steep but are typically gentle (>30%). Soils are characteristically poor, droughty and moderately to excessively well drained. The range includes islands supported by paralithic contacts, vertisols, and mudstones (Umpqua and Lookingglass formation). Climate is Mediterranean, with hot, dry summers and cool, wet winters. Elevations range from sea level to 7500ft. May include Brewer oak.

## Vegetation Description

Oregon white oak dominates a variable stand typically composed of widely spaced large individual trees with >35% canopy closure. Some stands in more protected settings could attain larger size and canopy closures. Understory typically perennial bunchgrass and perennial forbs. Other conspicuous species include ponderosa pine and madrone in the south and Douglas-fir in the north. Associated shrub species include poison oak, ceanothus, manzanita and garrya. Grass component includes Romer's fescue, Lemon's needle grass, California oatgrass, bluebunch wheatgrass and brome.

## Disturbance Description

Fire Regime I, primarily short-interval (<10yr) surface fires. Surface fires every 3-10yrs maintained an open savanna-like structure. Fires can be mixed severity especially when closed canopy conditions or additional species such as conifers and shrubs are present. Native burning was a significant factor in fire frequency of this type, but return intervals may increase significantly with a little distance from native settlements and valley bottoms.

\*\*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.

## Adjacency or Identification Concerns

In the south end of the range, Mixed Evergreen or Mixed Conifer, tanoak PNV and PSME or ABCO PNV may be adjacent. In the absence of frequent fire, ingrowth of both conifer and shrub species often occurs.

This type may be similar to the PNVG R1OAWD for the California Model Zone.

## Native Uncharacteristic Conditions

### Scale Description

The distribution of this type is naturally patchy on the landscape controlled by soil and aspect along with variable incidence of fire. The result is a typically smaller patch size on the order of 100s of acres (10-500).

### Issues/Problems

One model reviewer observed that the model appears to misrepresent the community in SW in regards to oak dominated communities with historically high canopy cover, especially in SW OR (Brewer's oak & transition into chaparral). A description of chaparral as a vegetation type adjacent to SW OR oak woodlands is necessary to prevent assumptions that chaparral with an oak component were historically more open. Similarly, naturally high canopy cover Brewer's oak communities that likely experienced stand replacement fire as a norm should also be better described. Poor assumptions about historic condition may lead to fuel reduction/restoration projects that detract from historic conditions, at least in a subset of woodland and adjacent communities in SW OR.

In response to the reviewer comments above, another model reviewer stated that Brewer's Oak communities in SW Oregon make up only a small part of the landscape and therefore, the reviewer didn't think there was much of a problem since the comment applied to such a small subset of the landscape.

### Comments

As a result of national QC the minimum height of class B and C was changed from 0.0m to 5.1m. The minimum canopy closure of B was changed from 35% to 31% and the maximum canopy closure in C was changed from 35% to 30%. Class D and E minimum height was changed from 0.0m to 10.1m. The maximum canopy closure in D was changed from 35% to 30% and the minimum canopy closure in E was changed from 35% to 31%. All changes were made to make the model comply w/ LANDFIRE rules.

This model was originally developed for Southwest Oregon as R#OWOA, with the current authors, reviewed by Paul Hosten. After meeting with Jane Kertis, it was expanded to include western OR & WA. Reviewers felt it generally encompasses the range of the species well but there are a wide variety of moisture regimes present in the range.

Thomas Atzet (jatzet@budget.net) also reviewed this model for MZ 2.

A reviewer for MZ02 added comments to Class descriptions, scale, site description, and disturbance description. This reviewer felt that replacement fire intervals could have been better modeled at half or two-thirds the interval indicated. As evidence, even in the area around Diamond Lake fire scarred trees were showing very frequent fire scars right at the soil level. Another reviewer commented that the classes were well defined for this type.

## Vegetation Classes

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\*\*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.

**Class A 10 %**

Early Development 1 All Structure

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model**  
1

**Indicator Species and Canopy Position**

QUGA4  
All  
CECU  
Lower  
TODI  
Lower  
FERO  
Lower

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	0 %	30 %
Height	Tree 0m	Tree 5m
Tree Size Class	Sapling >4.5ft; <5"DBH	

Upper layer lifeform differs from dominant lifeform.

**Description**

Bunchgrass/forb groundcover with resprouting oak and oak saplings following stand replacement fire. These areas were favored by the natives, maintenance fires were common, so early seral had a combination of grasses continuously recycled and larger oaks that were occasionally burned and killed. Poison oak can be an aggressive pioneer.

Succession to Class C after 30yrs. Replacement fire (MFRI=200yrs) resets to 0. Mixed fire MFRI=12.5yrs, and surface fire (MFRI=50yrs) have little effect on stand structure. After 28yrs without fire, there is succession to Class B.

**Class B 1 %**

Mid Development 1 Closed

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model**  
9

**Indicator Species and Canopy Position**

QUGA4  
All  
CECU  
Lower  
TODI  
Lower  
FERO  
Lower

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	31 %	100 %
Height	Tree 5.1m	Tree 10m
Tree Size Class	Medium 9-21"DBH	

Upper layer lifeform differs from dominant lifeform.

**Description**

>35% canopy cover QUGA sapling, pole, and medium size diameter. Understory and shrub layer of PSME, PIPO, CADE27, RHDI6,CECU, FERO, and CYEC.

Replacement fires (MFRI=300yrs) reset to Class A. Mixed fires (MFRI=10yrs) open up the stand to Class C. Insect.disease have a 0.001 annual probability of occurring (converts the patch to Class C).

**Class C 20 %**

Mid Development 1 Open

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model**  
1

**Indicator Species and Canopy Position**

QUGA4  
All  
FERO  
Lower  
PIPO  
All  
PSME  
All

**Structure Data (for upper layer lifeform)**

	Min	Max
Cover	0 %	30 %
Height	Tree 5.1m	Tree 10m
Tree Size Class	Medium 9-21"DBH	

Upper layer lifeform differs from dominant lifeform.

**Description**

\*\*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.

<35% canopy cover QUGA sapling, pole, and medium size diameter. Understory and shrub layer of PSME, PIPO, CADE27, TODI, CECU, FERO, and CYEC.

Replacement fire (MFRI=300yrs) resets to Class A. Mixed (MFRI=50yrs), surface fires (MFRI=12.5yrs) and grazing (annual prob.=0.02) maintain the patch in Class C. After 30yrs without fire, the patch succeeds to Class B.

<b>Class D</b> <b>64 %</b>	<b>Indicator Species and Canopy Position</b>	<b>Structure Data (for upper layer lifeform)</b>												
Late Development 1 Open	QUGA4	<table border="1"> <thead> <tr> <th></th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Cover</td> <td>0 %</td> <td>30 %</td> </tr> <tr> <td>Height</td> <td>Tree 10.1m</td> <td>Tree 25m</td> </tr> <tr> <td>Tree Size Class</td> <td colspan="2">Large 21-33"DBH</td> </tr> </tbody> </table>		Min	Max	Cover	0 %	30 %	Height	Tree 10.1m	Tree 25m	Tree Size Class	Large 21-33"DBH	
	Min	Max												
Cover	0 %	30 %												
Height	Tree 10.1m	Tree 25m												
Tree Size Class	Large 21-33"DBH													
<b>Upper Layer Lifeform</b>	All	<input type="checkbox"/> Upper layer lifeform differs from dominant lifeform.												
<input type="checkbox"/> Herbaceous	FERO													
<input type="checkbox"/> Shrub	Lower													
<input checked="" type="checkbox"/> Tree	PIPO													
<b>Fuel Model</b>	All													
1	DACA3													
	Lower													

**Description**

<35% large oak savanna with PSME, CADE27, and PIPO present in the overstory and the understory. FERO, RHDI, DACA3, and CYEC may also be present. Large scattered trees will occur in the late seral, however, they are rare.

Replacement fire (MFRI=300yrs) resets to Class A. Mixed (MFRI=100yrs), surface fires (MFR=11) and grazing (annual prob.=0.01) maintain the patch in Class D. After 30yrs without fire, the patch succeeds to Class E.

<b>Class E</b> <b>5 %</b>	<b>Indicator Species and Canopy Position</b>	<b>Structure Data (for upper layer lifeform)</b>												
Late Development 1 Closed	QUGA4	<table border="1"> <thead> <tr> <th></th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Cover</td> <td>31 %</td> <td>100 %</td> </tr> <tr> <td>Height</td> <td>Tree 10.1m</td> <td>Tree 25m</td> </tr> <tr> <td>Tree Size Class</td> <td colspan="2">Large 21-33"DBH</td> </tr> </tbody> </table>		Min	Max	Cover	31 %	100 %	Height	Tree 10.1m	Tree 25m	Tree Size Class	Large 21-33"DBH	
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<input checked="" type="checkbox"/> Tree	PIPO													
<b>Fuel Model</b>	All													
9	PSME													
	All													

**Description**

>35% canopy cover; mixture of large oak, Douglas-fir, ponderosa pine, incense cedar and/or misc shrub. Large scattered trees will occur in the late seral, however they are rare.

Replacement fire (MFRI=300yrs) resets to Class A. Mixed (MFRI=20yrs), surface fires (MFRI=33yrs), insect/disease (annual prob.=0.01) and wind/weather/stress (ann. Prob =0.01) maintain the patch in Class D.

**Disturbances**

\*\*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.

**Fire Regime Group\*\*:** I

**Historical Fire Size (acres)**

Avg 40  
Min 10  
Max 100

**Sources of Fire Regime Data**

- Literature
- Local Data
- Expert Estimate

**Additional Disturbances Modeled**

- Insects/Disease
- Native Grazing
- Other (optional 1)
- Wind/Weather/Stress
- Competition
- Other (optional 2)

<b>Fire Intervals</b>	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	275			0.00364	4
<i>Mixed</i>	50			0.02	19
<i>Surface</i>	12.5			0.08	77
<i>All Fires</i>	10			0.10364	

**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.

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