

LANDFIRE Biophysical Setting Model

Biophysical Setting 0910450

**Northern Rocky Mountain Dry-Mesic
Montane Mixed Conifer Forest**

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

General Information

Contributors (also see the Comments field) **Date** 10/5/2005
Modeler 1 Mike Simpson mlsimpson@fs.fed.us **Reviewer** Bruce Hostetler bhostetler@fs.fed.us
Modeler 2 Dave Powell dcpowell@fs.fed.us **Reviewer**
Modeler 3 Rod Clausnitzer rclausnitzer@fs.fed.us **Reviewer**

<u>Vegetation Type</u>	<u>Dominant Species</u>	<u>Map Zone</u>	<u>Model Zone</u>
Forest and Woodland	PIPO	9	☐ Alaska
	ABGR		☐ California
<u>General Model Sources</u>	PSME		☐ Great Basin
☒ Literature	CAGE2		☐ Great Lakes
☒ Local Data	CARU		☐ Hawaii
☒ Expert Estimate	SYAL		☐ Northeast
	SPBE2		☐ Northern Plains
			☐ N-Cent. Rockies
			☒ Pacific Northwest
			☐ South Central
			☐ Southeast
			☐ S. Appalachians
			☐ Southwest

Geographic Range

Modal population is in north-central Rockies (MZ10); also occurs in Blue Mountains OR and WA, Ochoco Mountains OR, Wallowa-Snake province in OR/WA. There may be trickles of this type in the foothills of Yakima and Klickitat county, especially on stream slopes, also in the SE of MZ08 on stream and river canyons in the foothills of the Blues.

Biophysical Site Description

Elevation range in eastside WA about 2000ft to about 6000ft, but most stands occur between 3000-4500ft. This forest type occurs just above ponderosa types on a moisture gradient.

Vegetation Description

Ponderosa pine overstory is typical in fire-maintained stands. Older stands tend to be of large, widely spaced ponderosa pine or Douglas-fir. Early seral forests are often open stands of mostly ponderosa pine. Lack of wildfire causes fill in of understory conifers, mainly ponderosa pine, Douglas-fir and grand fir. Western larch is locally important.

Disturbance Description

Typical disturbance regimes under natural conditions include frequent, low-intensity under-burns that maintain open stands of fire resistant trees. Much more infrequent mixed-severity and stand replacement wildfire occurred and tended to generate mosaics of older, larger trees and younger regeneration. Endemic bark beetles produced patch mortality. Rarer epidemic bark beetle outbreaks caused larger-scale overstory mortality and released understory trees. Defoliator outbreaks also caused fir mortality in some areas. Defoliation by spruce budworm is now more widespread than historically. Root diseases may play a significant role in later seral forests in this environment.

****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

This biophysical setting occurs below the more mesic mixed conifer forest types, and often occurs above ponderosa pine forests.

This BpS includes the following plant associations: PSME/elk sedge, PSME/pinegrass, PSME/snowberry, PSME/ninebark and similar types and grand fir (or grand fir-white fir hybrids) with similar associated species. It does not include moister PSME and ABGR types (e.g. PSME/HODI, PSME/ACGL, ABGR/CLUN, ABGR/VAME, ABGR/LIBO and similar moist types). White fir occurs in this type in southeastern OR.

Native Uncharacteristic Conditions

If these late successional classes exceed 50m height, the stand may be the 1047 MCON type.

Scale Description

Dry mixed conifer forests that often occur in large areas (hundreds to thousands of acres) that, due to fire and insect disturbances, often contained mosaics of older, larger trees and smaller trees.

Issues/Problems

Comments

Dave Swanson dswanson@fs.fed.us was another author on this model. This model was modified from Rapid Assessment model R#MCONdy. Review by Miles Hemstrom, Ed Uebler, Bill McArthur and Beth Willhite.

Vegetation Classes

Class A	10 %	<u>Indicator Species and Canopy Position</u>	<u>Structure Data (for upper layer lifeform)</u>												
Early Development 1 All Structure		PIPO	<table><tr><td></td><td><i>Min</i></td><td><i>Max</i></td></tr><tr><td><i>Cover</i></td><td>0 %</td><td>20 %</td></tr><tr><td><i>Height</i></td><td>Tree 0m</td><td>Tree 5m</td></tr><tr><td><i>Tree Size Class</i></td><td colspan="2">Sapling >4.5ft; <5"DBH</td></tr></table>		<i>Min</i>	<i>Max</i>	<i>Cover</i>	0 %	20 %	<i>Height</i>	Tree 0m	Tree 5m	<i>Tree Size Class</i>	Sapling >4.5ft; <5"DBH	
	<i>Min</i>	<i>Max</i>													
<i>Cover</i>	0 %	20 %													
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<i>Tree Size Class</i>	Sapling >4.5ft; <5"DBH														
<u>Upper Layer Lifeform</u>		Upper													
☐ Herbaceous		PSME													
☐ Shrub		Upper													
☒ Tree	<u>Fuel Model</u>	LAOC	☐ Upper layer lifeform differs from dominant lifeform.												
		Upper													
		CAGE2													
		Lower													
<u>Description</u>															
Open stand of ponderosa pine and other tree seedlings mixed with grasses and shrubs. Early seral dominant species include, ceanothus, scouler willow, Bromus, some sedges and grasses. We use Comp/Maintenance to hold a portion of this class back in an extended shrub-dominated stage. Also, we use AltSucc. without TSD to allow a portion of this type to succeed to class B - mid-closed.															

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Class B 5 %

Mid Development 1 Closed

Upper Layer Lifeform☐ Herbaceous☐ Shrub☒ Tree **Fuel Model****Indicator Species and Canopy Position**

PIPO

Upper

PSME

Mid-Upper

LAOC

Mid-Upper

ABGR

Mid-Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	41 %	100 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.**Description**

Closed stands of 5-20in DBH early seral tree species. Forests in this type rarely if ever exceed 80% canopy closure even in closed, dense conditions.

Class C 30 %

Mid Development 1 Open

Upper Layer Lifeform☐ Herbaceous☐ Shrub☒ Tree **Fuel Model****Indicator Species and Canopy Position**

PIPO

Upper

PSME

Mid-Upper

LAOC

Mid-Upper

ABGR

Mid-Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	11 %	40 %
Height	Tree 5.1m	Tree 25m
Tree Size Class	Medium 9-21"DBH	

☐ Upper layer lifeform differs from dominant lifeform.**Description**

Open stands of 5-20in DBH early seral tree species. Dominant understory plants include elk sedge, pinegrass, common snowberry, rose, mountain mahogany (wetter), heartleaf arnica and lupines. This class has low probability of replacement fire due to discontinuous fuel in these open stands. A small portion of the class succeeds to class E - late-closed.

Class D 45 %

Late Development 1 Open

Upper Layer Lifeform☐ Herbaceous☐ Shrub☒ Tree **Fuel Model****Indicator Species and Canopy Position**

PIPO

Upper

PSME

Mid-Upper

LAOC

Mid-Upper

ABGR

Mid-Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	11 %	40 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.**Description**

Open stands of 20in+ DBH early seral tree species. Dominant understory plants include elk sedge, pinegrass, common snowberry, rose, mountain mahogany (wetter), heartleaf arnica and lupines.

**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 E 10 %

Late Development 1 Closed

Upper Layer Lifeform☐ Herbaceous☐ Shrub☒ Tree**Fuel Model**

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Indicator Species and Canopy Position

PIPO

Upper

PSME

Upper

ABGR

Mid-Upper

LAOC

Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	41 %	100 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.**Description**

Closed stands of 20in+ DBH early seral tree species. Forests in this PNVG rarely if ever exceed 80% canopy closure even in closed, dense conditions. This class has relatively high probability of replacement fires, due to the dense understory, though it is less than the probability of replacement fire in the mid-closed.

Disturbances**Fire Regime Group**:** I**Historical Fire Size (acres)**

Avg 1000

Min

Max

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)**Fire Intervals**

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	135	70	200	0.00741	15
Mixed	110	70	175	0.00909	18
Surface	30	20	35	0.03333	67
All Fires	20			0.04983	

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.

References

Crowe, E. and R.R. Clausnitzer. 1997. Mid-montane wetland plant associations of the Malheur, Umatilla and Wallowa-Whitman National Forests. R6-NR-ECOL-TP-22-97. Portland, OR: USDA Forest Service, Pacific Northwest Region. 299 pp.

Heyerdahl, E.K. and J.K. Agee. 1996. Historical fire regimes of four sites in the Blue Mountains, Oregon and Washington. Final Report, University of Washington, Seattle. 173 pp.

Johnson, C.G. and R.R. Clausnitzer. 1992. Plant associations of the Blue and Ochoco Mountains. P6-ERW-TP-036-92. Portland, OR: USDA Forest Service, Pacific Northwest Region. 164 pp. + appendices.

Johnson, C.G. and S.A. Simon. 1986. Plant associations of the Wallowa-Snake province. R6-ECOL-TP-255b-86. Portland, OR: USDA Forest Service, Pacific Northwest Region. 272 pp. + appendices.

Hopkins, W.E. 1979a. Plant associations of the Fremont National Forest. USDA Forest Service R6 Ecol 79-

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004. Pacific Northwest Region, Portland Oregon. 106 pp. + illus.

Hopkins, W.E. 1979b. Plant associations of the south Chiloquin and Klamath Ranger Districts, Winema National Forest. USDA Forest Service R6 Ecol 79-005. Pacific Northwest Region, Portland, Oregon. 96 pp. + illus.

Mauroka, K.R. 1994. Fire history of *Pseudotsuga menziesii* and *Abies grandis* stands in the Blue Mountains of Oregon and Washington. M.S. Thesis, University of Washington, Seattle, WA. 73 pp.

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

Volland, L.A. 1988. Plant communities of the central Oregon pumice zone. R-6 Area Guide 4-2. Portland, OR: USDA Forest Service, Pacific Northwest Region. 113 pp. + appendices.

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