

LANDFIRE Biophysical Setting Model

Biophysical Setting 0811650

**Northern Rocky Mountain Foothill Conifer
Wooded Steppe**

☐ This BPS is lumped with:

☐ This BPS is split into multiple models:

General Information

Contributors (also see the Comments field)

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Vegetation Type

Forest and Woodland

Dominant Species

PIPO

FEID

ARTRV

Map Zone

8

Model Zone

☐ Alaska

☐ California

☐ Great Basin

☐ Great Lakes

☐ Hawaii

☐ Northeast

☐ Northern Plains

☐ N-Cent. Rockies

☒ Pacific Northwest

☐ South Central

☐ Southeast

☐ S. Appalachians

☐ Southwest

General Model Sources

☐ Literature

☒ Local Data

☒ Expert Estimate

Geographic Range

This system is found along the periphery of the Columbia Basin along the lower foothills of the eastern Cascades, the southern foothills of the Blues and Wallows, and in northern CA along the southern Cascades.

Biophysical Site Description

These savannas occur at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests typically in warm, dry, exposed or shallow soiled sites. Elevations range from less than 500m in British Columbia to 1600m in the central ID mountains. Occurrences are found on all slopes and aspects; however, moderately steep to very steep slopes or ridgetops are most common. This ecological system generally occurs on glacial till, glacio-fluvial sand and gravel, dune, basaltic rubble, colluvium, to deep loess or volcanic ash-derived soils, with characteristic features of good aeration and drainage, coarse textures, circumneutral to slightly acid pH, an abundance of mineral material, rockiness, and periods of drought during the growing season. These savannas in the eastern Cascades, Okanagan and northern Rockies regions receive winter and spring rains, and thus have a greater spring "green-up" than the drier woodlands and savannas in the central Rockies. In OR in the foothills of the Blue Mountains, this type may occur as outlier groves of pines in sagebrush steppe at low elevations, especially on cool-moist sites.

Vegetation Description

Pinus ponderosa (primarily var. *ponderosa*) is the primary conifer in the Pacific states, occasionally occurring with *Juniperus occidentalis*. Understory vegetation in the true savanna occurrences is predominantly fire-resistant shrubs (and sometimes grasses and forbs) that resprout following surface

**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.

fires; understory trees and downed logs are uncommon. Important species include *Artemisia tridentata* ssp. *vaseyana*, *Purshia tridentata*, *Chrysothamnus viscidiflorus* and *Ribes cereum*. Grasses, (when present) include: *Pseudoroegneria spicata*, *Leucopoa kingii*, *Hesperostipa* spp, *Achnatherum* spp, *Festuca idahoensis* or *Festuca campestris*.

Disturbance Description

This type usually has so little surface fuel that replacement fires would only be a function of high winds. However, surface fuel is dense enough to carry relatively frequent fires.

Adjacency or Identification Concerns

A century of anthropogenic disturbance and fire suppression has resulted in a higher density of *Juniperus occidentalis* or *Pinus ponderosa*, altering the fire regime and species composition. Presently, many stands contain understories of more shade-tolerant species.

Native Uncharacteristic Conditions

Scale Description

Occasionally this type is in patches as small as a few acres on rimrock and exposed sites, or places where snow melt may accumulate. However, the type also occurs in large patches on edaphic sites.

Issues/Problems

Very little data on this type. There are pines, but scar studies have not focused on this type, and (anecdotally) there are few scars on these pines. The current model attempts to describe the limited area that could be treed, leaving the surrounding shrub and grass modeled as other BpSs (mountain big sagebrush or canyon grassland).

Comments

Review for MZ09 added some comments to the vegetation description and geographic range.

Vegetation Classes

Class A 25 %	<u>Indicator Species and Canopy Position</u>	<u>Structure Data (for upper layer lifeform)</u>	
		Min	Max
Early Development 1 All Structure	PIPO	Cover 0 %	50 %
<u>Upper Layer Lifeform</u>	Upper	Height Tree 0m	Tree 10m
☐ Herbaceous	ARTRV	Tree Size Class Medium 9-21"DBH	
☐ Shrub	Low-Mid	☐ Upper layer lifeform differs from dominant lifeform.	
☒ Tree	<u>Fuel Model</u>		

Description

These young patches following replacement fires recover quickly in grasses and shrubs. Fires that kill the overstory occasionally reset the stand (MFRI=125yrs), but most fires allow quite a few of the trees to survive (MFRI=100yrs). Succession to class B after 40yrs. Some areas of this type only transition to grassland (Snake River Canyon, etc.) [modeled as AltSucc. with annual prob. = 0.005].

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Class B 15 %

Late Development 1 Open

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

PIPO

Upper

FEID

Lower

PSSP6

Lower

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	20 %
Height	Tree 10.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☒ Upper layer lifeform differs from dominant lifeform.

Mapping: Can you distinguish grass-understory savanna? Grasses can be close to 100% closure. If context is grass, then allow this to be 0-40% canopy closure.

Description

These established stands are maintained in savanna by surface fires (MFRI=77yrs). Replacement fires (MFRI=125yrs) reset to class A.

Class C 60 %

Late Development 2 Closed

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

PIPO

Upper

ARTRV

Low-Mid

Structure Data (for upper layer lifeform)

	Min	Max
Cover	21 %	40 %
Height	Tree 10.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☒ Upper layer lifeform differs from dominant lifeform.

Mapping: can you distinguish shrub understory savanna? Shrub canopy can be up to about 50-60% closure. If context is shrub, then allow this to be 0-40% canopy closure.

Description

These savanna-shrublands may be surrounded by mountain big sagebrush systems. Replacement fire (MFRI=125yrs) resets to class A. Surface fire (MFRI=100yrs) maintains in class C.

Class D 0 %

[Not Used] [Not Used]

Upper Layer Lifeform☐ Herbaceous☐ Shrub☐ Tree **Fuel Model****Indicator Species and Canopy Position****Structure Data (for upper layer lifeform)**

	Min	Max
Cover	%	%
Height		
Tree Size Class		

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

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Class E 0 %

[Not Used] [Not Used]

**Indicator Species and
Canopy Position**

Structure Data (for upper layer lifeform)

	<i>Min</i>	<i>Max</i>
<i>Cover</i>	%	%
<i>Height</i>		
<i>Tree Size Class</i>		

Upper Layer Lifeform

- ☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model

☐ Upper layer lifeform differs from dominant lifeform.

Description

Disturbances

Fire Regime Group:** III

Historical Fire Size (acres)

Avg

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

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	125			0.008	43
<i>Mixed</i>	400			0.0025	14
<i>Surface</i>	125			0.008	43
<i>All Fires</i>	54			0.0185	

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

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- Miller, R.F. and J.A. Rose. 1999. Fire history and western juniper encroachment in sagebrush steppe. Journal of Range Management. 52: 550-559.
- NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

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