

# LANDFIRE Biophysical Setting Model

**Biophysical Setting 0810800**

**Inter-Mountain Basins Big Sagebrush  
Shrubland**

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

## General Information

**Contributors** (also see the Comments field)      **Date** 10/6/2005

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<u>Vegetation Type</u>	<u>Dominant Species</u>	<u>Map Zone</u>	<u>Model Zone</u>	
Upland Shrubland	ARTRW8 GRSP	8	<input type="checkbox"/> Alaska	<input type="checkbox"/> Northern Plains
<b>General Model Sources</b>	POSE		<input type="checkbox"/> California	<input type="checkbox"/> N-Cent. Rockies
<input checked="" type="checkbox"/> Literature	BACA3		<input type="checkbox"/> Great Basin	<input checked="" type="checkbox"/> Pacific Northwest
<input type="checkbox"/> Local Data	HECO26		<input type="checkbox"/> Great Lakes	<input type="checkbox"/> South Central
<input checked="" type="checkbox"/> Expert Estimate	ACHY		<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 central WA, Pasco Basin and similarly low-lying areas of the Columbia Plateau in WA, and likely occurs in northern OR along the Columbia and Snake rivers. Additionally, the type may occur around Pleistocene lakes in the Great Basin.

## Biophysical Site Description

This BpS occurs in the warmest and driest portions of the Columbia Plateau. Soils vary from silt-loam to sandy to lithic, although surface rock is uncommon in the lithic soil types. Average annual precipitation is around 6-7in, falling primarily as winter rain.

## Vegetation Description

Wyoming big sagebrush is the primary species. Spiny hopsage is often associated with the Wyoming big sagebrush and occasionally co-dominant or dominant. Basin big sagebrush is uncommon and limited to the most mesic sites.

Sandberg's bluegrass is the primary herbaceous species. Large bunchgrasses are generally absent except on sandy soils where needle-and-thread and Indian ricegrass occur. Forbs are relatively sparse and species richness relatively low compared to other big sagebrush BpSs.

## Disturbance Description

Lightning fires are relatively rare due to a combination of a low number of strikes relative to surrounding areas and accompanying rain that often extinguishes starts. The BpS typically lacks the fine fuel needed to help fires start and spread readily. Nonetheless, fires did occur occasionally and could burn large areas,

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usually driven by wind.

Shrub die-offs have occurred in the late 20th century in this type, but the causes are largely unknown. Whether similar die-offs were characteristic of the historical conditions is also unknown.

### **Adjacency or Identification Concerns**

This type can easily be confused with the late-seral closed canopy stage of Inter-Mountain Basins Big Sagebrush Steppe (1125), particularly since fire exclusion, grazing and other land use practices have resulted in a shift towards the late seral closed canopy stage in that BpS. However, from the ground level, large bunchgrasses, particularly bluebunch wheatgrass, are generally absent from this BpS.

The Inter-Mountain Basins Big Sagebrush Steppe occurs adjacent and intergrades with this BpS. Inter-Mountain Basin Sparsely Vegetated Systems, particularly the Active and Stabilized Dune formation, co-occurs with this type.

### **Native Uncharacteristic Conditions**

If more than 40% shrub cover is present then another BpS is present.

### **Scale Description**

This community occurs in the 1000s to 10000s of acres, and disturbances could effect large areas of this.

### **Issues/Problems**

Past over-grazing allowed invasive annual grasses, mostly cheatgrass, to establish within this BpS. Cheatgrass has fueled larger and more frequent fires than occurred historically and is resulting in a type conversion.

Grazing probably also contributed to an increasing density of large shrubs and reduction of perennial grasses.

Spiny hopsage has only rarely been observed to reproduce in central WA over the last 50yrs, basically since observations began.

The scope, scale, and purpose for any burning by Native Americans is not known.

### **Comments**

Although the return interval suggests fire regime II, this was a mixed severity regime with relatively infrequent fire due to highly variable fine fuel. Many fires may have been small in size (under 100ac) and not as ecologically significant as fires over 100ac. These larger fires were more likely following wetter than average years with higher than average grass loadings.

Reviewers added a bit to extend the geographic range of the type, and to add rabbitbrush (*Chrysothamnus*) as a common shrub in the type, especially after disturbance. Large perennial bunchgrasses would also be common in addition to Sandberg's bluegrass. Needle-and-thread, bluebunch wheatgrass and basin wildrye would be the dominants.

## **Vegetation Classes**

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**Class A 15 %**

Early Development 1 All Structure

**Upper Layer Lifeform**

- Herbaceous  
 Shrub  
 Tree

**Fuel Model**

1

**Description**

This class is dominated by herbs with canopy closure up to 10%. Typical species include Sandberg's bluegrass with needle-and-thread and Indian ricegrass on sandy soils and perennial forbs such as Carey's balsamroot and native annual forbs. Succession to class B after 15yrs.

**Indicator Species and Canopy Position**

POSE  
 Low-Mid  
 HECO26  
 Upper  
 AMSIN  
 Middle  
 EPILO  
 Middle

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

	Min	Max
Cover	0 %	10 %
Height	Herb 0m	Herb 0.5m
Tree Size Class	None	

Upper layer lifeform differs from dominant lifeform.

**Class B 35 %**

Mid Development 1 Open

**Upper Layer Lifeform**

- Herbaceous  
 Shrub  
 Tree

**Fuel Model**

1

**Description**

Small, scattered sagebrush and spiny hopsage are now present although canopy cover from shrubs is generally <10%. Sandberg's bluegrass remains the dominant grass species on most soils. Forbs are well established and essentially mature with cover of <10% Total vegetation cover is generally 25% or less. Biological soil crust is reforming but large amounts of bare ground remain. Succession to class C after 20yrs. Mixed and replacement fires.

**Indicator Species and Canopy Position**

POSE  
 Low-Mid  
 ARTRW8  
 Upper  
 GRSP  
 Mid-Upper  
 HECO26  
 Upper

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

	Min	Max
Cover	0 %	10 %
Height	Shrub 0m	Shrub 0.5m
Tree Size Class	None	

Upper layer lifeform differs from dominant lifeform.

Dominant lifeform is herb. Min cover is 11%; max cover is 20%. Min height is 0m, max height is 0.5m.

**Class C 40 %**

Late Development 1 Open

**Upper Layer Lifeform**

- Herbaceous  
 Shrub  
 Tree

**Fuel Model**

1

**Description**

Sagebrush and spiny hopsage are approaching maximum size with some additional regeneration present. Shrub cover is higher, but still generally <20%. The mix of grass and forb species generally remains unchanged with a canopy cover of about 20% or less. Biological soil crusts are now well developed although areas of bare soil remain. Succession to class D after 45yrs.

**Indicator Species and Canopy Position**

ARTRW8  
 Upper  
 GRSP  
 Upper  
 POSE  
 Low-Mid  
 HECO26  
 Upper

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

	Min	Max
Cover	11 %	20 %
Height	Shrub 0.6m	Shrub 1.0m
Tree Size Class	None	

Upper layer lifeform differs from dominant lifeform.

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**Class D 10 %**

Late Development 1 Closed

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model**

5

**Indicator Species and Canopy Position**

ARTRW8  
Upper  
GRSP  
Upper  
POSE  
Lower  
HECO26  
Mid-Upper

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

	Min	Max
Cover	21 %	40 %
Height	Shrub 0.6m	Shrub 1.0m
Tree Size Class	None	

Upper layer lifeform differs from dominant lifeform.

**Description**

Generally, after about 80yrs the site now supports the maximum cover it can, but is still generally <40% cover overall. Shrubs comprise most of this cover with grasses and forbs contributing a minor amount. Biological soil crusts are fully developed with relatively few areas of bare soil.

**Class E 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**

**Disturbances**

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

**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)

<b>Fire Intervals</b>	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	72			0.01389	45
Mixed	60			0.01667	55
Surface					
All Fires	33			0.03057	

**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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