**Landfire Biophysical Setting Model**

**Biophysical Setting 0110800**

**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)  
Modeler 1: Louisa Evers  
Louisa_Evers@blm.gov  
Modeler 2: Jim Evans  
jevans@tnc.org  
Modeler 3

**Date**  
10/6/2005

**Reviewer**  
Jeff Rose/Gregg Riegel  
Jeffrey_Rose@blm.gov

### Vegetation Type

General Upland Shrubland

**Dominant Species**

- ARTRW8
- GRSP
- POSE
- BACA3
- HECO26
- ACHY

**Map Zone**

- 1

**Model Zone**

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

### Geographic Range

This BPS occurs in central Washington, Pasco Basin and similarly low-lying areas of the Columbia Plateau in Washington, and likely occurs in northern Oregon 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 6-7 inches, 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 fuels needed to help fires start and spread readily. Nonetheless, fires did occur occasionally and could burn large

---

**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.
areas, usually driven by wind.

Shrub die-offs have occurred in the late 20th C. 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 Stablized 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 1,000s to 10,000s of acres, and disturbances could affect 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 Washington over the last 50 years, 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 fuels. Many fires may have been small in size (<100 acres) and not as ecologically significant as fires >100 acres. 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, basin wildrye would be the dominants.

This model was imported straight from Z08 by Brendan Ward.

**Vegetation Classes**

**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** 15%
Early Development 1 All Structure

**Upper Layer Lifeform**
- **Herbaceous**
- Shrub
- Tree

**Indicator Species and Canopy Position**
- POSE
- Low-Mid
- HECO26
- Upper
- AMSIN
- Middle
- EPILO
- Middle

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSE</td>
<td>0%</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Class B** 35%
Mid Development 1 Open

**Upper Layer Lifeform**
- Herbaceous
- Shrub
- Tree

**Indicator Species and Canopy Position**
- POSE
- Low-Mid
- ARTRW8
- Upper
- GRSP
- Mid-Upper
- HECO26
- Upper

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSE</td>
<td>0%</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Class C** 40%
Late Development 1 Open

**Upper Layer Lifeform**
- Herbaceous
- Shrub
- Tree

**Indicator Species and Canopy Position**
- ARTRW8
- Upper
- GRSP
- Upper
- POSE
- Low-Mid
- HECO26
- Upper

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTRW8</td>
<td>11%</td>
<td>20%</td>
</tr>
</tbody>
</table>

**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.
### Disturbances

#### Fire Regime Group**

<table>
<thead>
<tr>
<th>Historical Fire Size (acres)</th>
<th>Fire Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Avg Fi</td>
</tr>
<tr>
<td>Replacement</td>
<td>72</td>
</tr>
<tr>
<td>Mixed</td>
<td>60</td>
</tr>
</tbody>
</table>

#### Sources of Fire Regime Data

- Literature
- Local Data
- Expert Estimate

**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.

### References


---

**Class D** 10 %

<table>
<thead>
<tr>
<th>Upper Layer Lifeform</th>
<th>Indicator Species and Canopy Position</th>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbaceous</td>
<td>ARTRW8</td>
<td>Min</td>
</tr>
<tr>
<td>Shrub</td>
<td>Upper</td>
<td>21 %</td>
</tr>
<tr>
<td>Tree</td>
<td>GRSP</td>
<td>Height</td>
</tr>
<tr>
<td>POSE</td>
<td>Lower</td>
<td>Tree Size Class</td>
</tr>
<tr>
<td>HECO26</td>
<td>Mid-Upper</td>
<td></td>
</tr>
</tbody>
</table>

*Upper layer lifeform differs from dominant lifeform.*

**Description**

Generally, after about 80 years the site now supports the maximum cover it can, but is still generally less than 40% 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 %

<table>
<thead>
<tr>
<th>Upper Layer Lifeform</th>
<th>Indicator Species and Canopy Position</th>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbaceous</td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td>Shrub</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Upper layer lifeform differs from dominant lifeform.*

**Description**

---

**References**


---

**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.
Northwest National Laboratory, Richland, WA.


**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.**