**Rapid Assessment Reference Condition Model**

The Rapid Assessment is a component of the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004-2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.

**Potential Natural Vegetation Group (PNVG):**

R2MGWAw₂s | Great Basin Grassland

### General Information

**Contributors** (additional contributors may be listed under “Model Evolution and Comments”)

**Modelers**
- Cheri Howell chowell02@fs.fed.us
- Louis Provencher (edit) lprovencher@tnc.org

**Reviewers**

**Vegetation Type**

- Grassland

**Dominant Species**

- LECI4
- DIST3
- CAD₀2
- POSE

**LANDFIRE Mapping Zones**

- 12 17
- 13 18
- 16

**Geographic Range**

Northern and Central Great Basin.

**Biophysical Site Description**

Elevation: 5000-7000 feet

- Landform: moist to dry floodplain, saline bottom
- Soils: Deep, somewhat poorly drained, mollic, loamy (most silt loams to some clay loams), may be saline, very little rock or gravel present
- Slopes: 0 to 4%
- Precipitation: 6 to 14 inches

**Vegetation Description**

80-100% graminoids with dominant species being Basin wildrye (Leymus cinereus), Sandberg's or Nevada bluegrass (Poa secunda), Western wheatgrass (Pascopyron smithii), cordgrass (Spartina spp.), alkali saltgrass (Distichlis stricta), Douglas sedge (Carex douglasii), Shorthair sedge (Carex eetsera), Mat muhly (Muhlenbergia richardsonis), dropseed (Sporobolus spp.), Baltic rush (Juncus balticus).

About 5% forbs (High cover of forbs indicates altered conditions).

Shrubs found at 5 to 10%. Common shrubs are Basin big sagebrush (Artemisia tridentata tridentata), at the higher elevations (Artemisia tridentata vaseyan), rubber rabbitbrush (Ericameria nauseosa), rabbitbrush (Chrysothamnus spp.) At high cover, shrubs indicate an altered state.

**Disturbance Description**

Fire most often occurred in these sites, when adjacent shrublands burned. Fires were typically mixed (average FRI of 37 years) and stand replacement (average FRI of 75 years). Most species respond favorably.

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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

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to fire. Rabbitbrush tends to increase with spring and summer fires.

These sites were prone to flooding during high precipitation, resulting in erosion of topsoil and some short term loss of vegetative cover. In cases of +500 yr flooding event, the site could downcut, thus lowering the water table, and favored woody species in an altered state.

Infrequent native grazing has occurred, which may have resulted in heavy defoliation, but was confined to small acreage and generally temporary in nature. Drought cycles likely resulted in a reduction in vegetative cover, production and acreage of these sites. Drought negatively affected woody species. Native American's likely used these sites for camping and some vegetation collection, while hunting and gathering in adjacent wetlands. Human's likely caused heavy impacts to soils and vegetation in small campsites, but overall impact was light and transitory in nature.

**Adjacency or Identification Concerns**

Found adjacent to wet meadows, wetlands, sagebrush uplands and salt desert shrublands. Sites adjacent to sagebrush uplands tended to burn more frequently than sites adjacent to wet or salt desert shrub. This system is similar to the Mountain Mesic to Dry Meadow (R2MGCOws), but with longer FRI for replacement fire and less native grazing.

**Scale Description**

These sites are generally small and often moist. Fire in these systems is usually introduced from adjacent shrublands or native burning to improve herbaceous understory.

**Issues/Problems**

Many of these sites were impacted by introduced grazing animals post-European settlement and have been converted to shrub dominated systems with soil compaction problems that tend toward an increase in tap-rooted forb species. Class D is found more frequently now, due to altered disturbance regimes with livestock grazing, changes in fire frequency, altered water flow and climate change.

**Model Evolution and Comments**

This PNVG was submitted to 4 experts for review, but none return reviews.

### Succession Classes

Succession classes are the equivalent of "Vegetation Fuel Classes" as defined in the Interagency FRCC Guidebook (www.frcc.gov).

<table>
<thead>
<tr>
<th>Succession Class</th>
<th>Dominant Lifeform</th>
<th>Indicator Species* and Canopy Position</th>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class A</strong> 5%</td>
<td>Early Open</td>
<td>LEC14, POSE, CADO2, DIST3</td>
<td>Min</td>
</tr>
<tr>
<td>Description</td>
<td>Post fire, flood or drought early seral community. Bare ground is 10 to 30%. Total vegetative canopy cover is 0-25%. Relative forb cover is 10-40%. Relative graminoid cover is 60-90%. Shrub cover is minimal or non-existent. Replacement fire (FRI of 75 yrs) maintains the vegetation in A, whereas mixed severity fire (FRI of 37 yrs), while occurring, does not change the successional age. Rare</td>
<td>Cover</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>no data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tree Size Class</td>
<td>no data</td>
</tr>
<tr>
<td><strong>Upper Layer Lifeform</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Herbaceous</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Shrub</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Tree</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuel Model</strong></td>
<td>no data</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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flood events (average return interval of 500-yr) moves the vegetation to a more shrubby condition, D, after downcutting. Succession is from A to B.

**Class B** 73%

**Mid1 Open**

**Description**
Mostly stable and resilient system. Bare ground is less than 10%. Total canopy cover is 25-80%. Relative cover of grasses is >85%. Relative cover of forbs is 0-5%. Relative cover of shrubs is 0-10%.

Replacement fire (FRI 75 years) causes a transition to A, whereas mixed severity (FRI of 37 yrs), while active, does not affect the successional age of B. Weather and flooding affects this system in three different ways: 1) Recurring drought with a 100-yr return interval will thin vegetation and keep this state open; 2) The site will be scoured, but not downcut, by 100-yr flood events causing a transition to A; and 3) Rare 1000-yr flooding event will cause a downcut and alteration of the site towards a more permanent woody condition (D). Succession is from B to C.

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

<table>
<thead>
<tr>
<th>Indicator Species* and Canopy Position</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Fuel Model** no data

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**Class C** 20%

**Late1 Open**

**Description**
This system differs from mid-open by an increase in the shrub cover component. Bare ground is <10%. Total canopy cover is 50-80%. Relative cover of grasses is 25-50%. Relative cover of forbs is 0-5%. Relative cover of shrubs (most frequently rubber rabbitbrush and Basin big sagebrush) is 10-75%.

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

<table>
<thead>
<tr>
<th>Indicator Species* and Canopy Position</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Fuel Model** no data

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The dynamics of C are similar to those of B, except that drought causes a transition to B (not A) through the thinning of shrubs. State C, unlike B, experiences infrequent native grazing (browsing) that will reduce woody vegetation and cause a transition to B. Succession remains in C.

### Class D 2%

**Mid1 Closed**

**Description**

This system differs from mid-open by a significant increase in the shrub cover component. Bare ground is <20%. Total canopy cover can exceed 100% due to shrub dominance. Relative cover of grasses is <25%. Relative cover of forbs is 0-5%. Relative cover of shrubs (most frequently rabbitbrush and Basin big sagebrush) is >75%. Replacement fire (FRI of 75 yrs) and 100-yr flood event are the only disturbances causing a transition to A. Mixed severity fire (average FRI of 37 yrs) opens the stand, but maintain in a woody state (transition to C).

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

<table>
<thead>
<tr>
<th>Indicator Species* and Canopy Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEC14</td>
</tr>
<tr>
<td>DIST3</td>
</tr>
<tr>
<td>ERNA10</td>
</tr>
<tr>
<td>ARTRT</td>
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</table>

<table>
<thead>
<tr>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Cover</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>Tree Size Class</td>
</tr>
</tbody>
</table>

### Class E 0%

**Late1 Closed**

**Description**

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

<table>
<thead>
<tr>
<th>Indicator Species* and Canopy Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Cover</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>Tree Size Class</td>
</tr>
</tbody>
</table>

**Disturbances**

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Non-Fire Disturbances Modeled

- Insects/Disease
- Wind/Weather/Stress
- Native Grazing
- Competition
- Other:
- Other:

Historical Fire Size (acres)

- Avg:
- Min:
- Max:

Sources of Fire Regime Data

- Literature
- Local Data
- Expert Estimate

<table>
<thead>
<tr>
<th>Fire Regime Group:</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: 0-35 year frequency, low and mixed severity</td>
<td></td>
</tr>
<tr>
<td>II: 0-35 year frequency, replacement severity</td>
<td></td>
</tr>
<tr>
<td>III: 35-200 year frequency, low and mixed severity</td>
<td></td>
</tr>
<tr>
<td>IV: 35-200 year frequency, replacement severity</td>
<td></td>
</tr>
<tr>
<td>V: 200+ year frequency, replacement severity</td>
<td></td>
</tr>
</tbody>
</table>

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 the 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. All values are estimates and not precise.

<table>
<thead>
<tr>
<th>Sources of Fire Regime Data</th>
<th>Avg FI</th>
<th>Min FI</th>
<th>Max FI</th>
<th>Probability</th>
<th>Percent of All Fires</th>
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</thead>
<tbody>
<tr>
<td>Replacement</td>
<td>75</td>
<td>40</td>
<td>110</td>
<td>0.01333</td>
<td>33</td>
</tr>
<tr>
<td>Mixed</td>
<td>37</td>
<td>20</td>
<td>54</td>
<td>0.02703</td>
<td>67</td>
</tr>
<tr>
<td>Surface</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Fires</td>
<td>25</td>
<td></td>
<td></td>
<td>0.04037</td>
<td></td>
</tr>
</tbody>
</table>

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