11350

Inter-Mountain Basins Semi-Desert Grassland

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
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Vegetation Type

Herbaceous

Map Zone

25

Geographic Range

Occurs throughout the inter-mountain western United States on dry plains and mesas; in the northern and western portions of map zone (MZ) 25.

Biophysical Site Description

This Biophysical Setting (BpS) is found at approximately 1,450-2,320m (4,750-7,610ft) elevation. These grasslands occur in lowland and upland areas and may occupy swales, playas, mesa tops, plateau parks, alluvial flats, and plains, but sites are typically xeric. Substrates are often well-drained sandy or loamy textured soils derived from sedimentary parent materials, but are quite variable and may include fine-texture soils derived from igneous and metamorphic rocks. These grasslands typically occur on xeric sites. When they occur near foothill grasslands, they are at lower elevations. These grasslands occur on a variety of aspects and slopes. Sites may range from flat to moderately steep. Annual precipitation is usually from 20-40cm (7.9-15.7in).

Vegetation Description

Grasslands within this system are typically characterized by a sparse to moderately dense herbaceous layer dominated by medium-tall and short bunchgrasses, often in a sod-forming growth. The dominant perennial bunchgrasses and shrubs within this system are all very drought-resistant plants. These grasslands are typically dominated or co-dominated by *Achnatherum hymenoides*, *Aristida* spp., *Boutelous eriopida*, *Bouteloua gracilis*, *Hesperostipa mexicana*, *Muhlenbergia* spp.or *Pleuraphis jamesii* and may include scattered shrubs and dwarf shrubs of species of *Artemisia*, *Atriplex*, *Coleogyne*, *Ephedra*, *Gutierrezia*, or *Krascheninnikovia lanata*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| BOGR2 | *Bouteloua gracilis* | Blue grama |
| ACHY | *Achnatherum hymenoides* | Indian ricegrass |
| HECO26 | *Hesperostipa comata* | Needle and thread |
| PLEUR12 | *Pleuraphis* | Galleta grass |
| ARIST | *Aristida* | Threeawn |
| MUHLE | *Muhlenbergia* | Muhly |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

Fire is infrequent in this system due to lack of fine fuel. Exception is in swales. Fire was usually introduced from adjacent shrubland/grassland or was due to Native American ignitions to improve herbaceous understory.

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 events, the site could downcut, thus lowering the water table and favor woody species in an altered state.

Drought cycles likely resulted in a reduction in vegetative cover, production, and acreage of these sites. Annual growth of woody vegetation depends on annual rainfall; drought negatively affected woody species. Cyclic drought impacts on growth occurs 2-3yrs out of every 10yrs, and vegetation-killing drought occurs about once a century.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 25 | 98 | 20 | 110 |
| Moderate (Mixed) | 1003 | 2 |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 25 | 100 |  |  |

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. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

These sites are generally small relative to the entire MZ. Size varies from a few acres to thousands.

Adjacency or Identification Concerns

Found adjacent to giant sacaton swells.

Many of these sites were impacted by the introduction of grazing animals following European settlement. Head-cutting of drainages decreased functionality of systems.

Issues or Problems

The scale of historical fire is unknown and numbers provided are a guess.

Native Uncharacteristic Conditions

Comments

During the 2017 review, Kori Blankenship changed the class-maintaining mixed fires in the Early 1 Open, Mid 1 Open, and Late 1 Open classes from mixed to replacement severity to comply with LANDFIRE fire severity definitions; transition probabilities were not changed. LANDFIRE defines replacement severity fire as a fire that top-kills >75% of the upper layer lifeform. Because most major species listed for this BpS are top-killed by fire (per their respective Fire Effects Information System species reviews), Blankenship assumed the modelers used mixed fire to represent a very patchy fire. But, because where fire occurred it probably top-killed most plants, it met LANDFIRE’s replacement fire criteria. Note that this change resulted in two replacement fire transitions in the Early 1 Open class: a replacement fire that burned more continuously and reset the class age, and one that left more unburned patches and did not reset the class age.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | B | B | B | B | B | B | B | B |
| Herb | 0.5-1.0 | A | A | B | B | B | B | B | B | B | B |
| Herb | >1.0 | A | A | B | B | B | B | B | B | B | B |
| Shrub | 0-0.5 | C | C | C | C | C | C | C | C | D | D |
| Shrub | 0.5-1.0 | C | C | C | C | C | C | C | C | D | D |
| Shrub | 1.0-3.0 | C | C | C | C | C | C | C | C | D | D |
| Shrub | >3.0 | C | C | C | C | C | C | C | C | D | D |
| Tree | 0-5 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | 5-10 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | 10-25 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | 25-50 | D | D | D | D | D | UN | UN | UN | UN | UN |
| Tree | >50 | D | D | D | D | D | UN | UN | UN | UN | UN |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 4 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOGR2 | Bouteloua gracilis | Blue grama | Upper |
| ACHY | Achnatherum hymenoides | Indian ricegrass | Upper |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| PLEUR12 | Pleuraphis | Galleta grass | Upper |

Description

Post-fire, flood, or drought early-seral community. Bare ground is 10-30%.Total vegetative canopy cover is 0-25%. Relative forb cover is 10-40%. Relative graminoid cover is 60-90%. Shrub cover is minimal or nonexistent.

*Maximum Tree Size Class*  
None

Class B 74 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOGR2 | Bouteloua gracilis | Blue grama | Upper |
| ACHY | Achnatherum hymenoides | Indian ricegrass | Upper |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| PLEUR12 | Pleuraphis | Galleta grass | Upper |

Description

Mostly stable and resilient system. Bare ground is <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%. Weather and flooding affects this system in two different ways: (1) recurring drought thins vegetation and keeps it open and (2) the site is scoured and downcut by flood events.

*Maximum Tree Size Class*  
None

Class C 18 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |
| ACHY | Achnatherum hymenoides | Indian ricegrass | Lower |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| PLEUR12 | Pleuraphis | Galleta grass | Upper |

Description

This system differs from Mid Open by an increase in the shrub cover component. Bare ground is >10%, increasing due to upsurge of shrub, rabbitbrush, and juniper invasion. 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) is 10-75%. Drought and native grazing thin shrubs.

*Maximum Tree Size Class*  
None

Class D 4 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOGR2 | Bouteloua gracilis | Blue grama | Lower |
| ACHY | Achnatherum hymenoides | Indian ricegrass | Lower |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| PLEUR12 | Pleuraphis | Galleta grass | Upper |

Description

Juniper-invaded system results from a lack of disturbance. As juniper component expands, bare soil increases and shrub decreases.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Mid1:OPN | 2 |
| Mid1:CLS | 1 | Mid1:CLS | 999 |
| Mid1:OPN | 3 | Late1:OPN | 37 |
| Late1:OPN | 38 | Late1:OPN | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Replacement Fire | Early1:OPN | Early1:OPN | 0.013 | 77 | Yes | 0 |
| Replacement Fire | Early1:OPN | Early1:OPN | 0.027 | 37 | No | 0 |
| Wind or Weather or Stress | Mid1:OPN | Mid1:OPN | 0.01 | 100 | No | 0 |
| Wind or Weather or Stress | Mid1:OPN | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:OPN | 0.013 | 77 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Mid1:OPN | 0.027 | 37 | No | 0 |
| Wind or Weather or Stress | Mid1:CLS | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:OPN | 0.013 | 77 | Yes | 0 |
| Mixed Fire | Mid1:CLS | Late1:OPN | 0.027 | 37 | Yes | 0 |
| Native Grazing | Late1:OPN | Mid1:OPN | 0.001 | 1000 | Yes | 0 |
| Alternative Succession | Late1:OPN | Mid1:CLS | 0.01 | 100 | Yes | 0 |
| Wind or Weather or Stress | Late1:OPN | Early1:OPN | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:OPN | 0.013 | 77 | Yes | 0 |
| Wind or Weather or Stress | Late1:OPN | Mid1:OPN | 0.02 | 50 | Yes | 0 |
| Replacement Fire | Late1:OPN | Mid1:OPN | 0.027 | 37 | Yes | 0 |

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