11350

Inter-Mountain Basins Semi-Desert Grassland

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Mike Zielenski | mike\_zielinski@nv.blm.gov | Eric Limbach | eric\_limbach@blm.gov |
| Louis Provencher | lprovencher@tnc.org | None | None |
| None | None | None | None |

Reviewers: Kori Blankenship, Andrea Laliberte

Vegetation Type

Herbaceous

Map Zones

7, 8, 9, 10, 12, 17, 18

Geographic Range

Occurs throughout the Intermountain western United States on sandsheets or stabilized dunes.

Biophysical Site Description

Ecological systems found at approximately 4,200-5,000ft of elevation in the Great Basin. These grasslands occur in lowland and upland areas and may occupy sandsheets, stabilized dunes, swales, playas, mesa tops, plateau parks, alluvial flats, and plains, but sites are typically xeric. Substrates are often excessively to well-drained sandy or loamy-textured soils derived from sedimentary parent materials but are quite variable and may include fine-textured soils derived from igneous and metamorphic rocks. These grasslands typically occur on aridic sites. When they occur near foothill grasslands, they will be 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 6-10in in the Great Basin.

Vegetation Description

Grasslands within this system are typically characterized by a sparse to moderately dense herbaceous layer dominated by medium-tall and short bunchgrasses. 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* or *Hesperostipa comata* and may include scattered shrubs and dwarf-shrubs of species of *Artemisia tridentata*, *Atriplex canescens*, *Ephedra*, or *Krascheninnikovia lanata*.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ACHY | *Achnatherum hymenoides* | Indian ricegrass |
| HECO26 | *Hesperostipa comata* | Needle and thread |
| LECI4 | *Leymus cinereus* | Basin wildrye |
| ARTR2 | *Artemisia tridentata* | Big sagebrush |
| GRSP | *Grayia spinosa* | Spiny hopsage |
| ATCA2 | *Atriplex canescens* | Fourwing saltbush |

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

Disturbance Description

This system is maintained by frequent fires and sometimes associated with specific soils, often well-drained clay soils. Fire most often occurred in these sites, when adjacent shrublands (BpS 1080, 1125) burned. Therefore, the disturbance dynamics of this system are similar to those of Biophysical Setting (BpS) 1125: hence, it was assumed that dominant fires were stand-replacement (mean fire return intervals of 75-94yrs) due to the continuity of fine fuel. Patchy fires that removed some of the woody vegetation played a minor role during late development. Re-establishment following fire is from resprouting grasses with shrubs re-establishing from seed over time. Other disturbances included insects (e.g., moths and grasshoppers that eat leaves and moth larval grubs that eat roots), periods of drought and wet cycles, and shifts in climate.

Native Americans likely used these sites for camping and vegetation collection (seeds of Indian ricegrass).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 82 | 100 | 30 | 500 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 82 | 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

Semi-desert grassland can be large (>10,000ac) when associated with extensive sandsheet systems. Historic disturbance (fire) likely ranged from small (<10ac) to large (>10,000ac) depending on conditions, time since last ignition, and fuel loading. Assumed the average patch size of fire is 250ac.

Adjacency or Identification Concerns

NatureServe description for BpS 1135 includes *Muhlenbergia*-dominated grasslands that flood temporarily. *Muhlenbergia* grasslands and flooding are not part of these sandy systems in Nevada.

Found adjacent to BpS 1125 and 1080, sagebrush steppe and semi-desert. Fires in sagebrush types spread to BpS 1135.

Many of these sites were impacted by introduced grazing animals post-European settlement and have been converted to shrub-dominated systems.

Cheatgrass is present in these ecological systems but does not dominate due to the high sand content.

Issues or Problems

The scale of historic fire is unknown and numbers provided represent estimates. Native burning was presumably important to encourage seed production, but data are lacking.

Native Uncharacteristic Conditions

Comments

During the 2017 Review, Kori Blankenship changed the class-maintaining mixed fire in the late class 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 topkills >75% of the upper-layer lifeform. Because most major species listed for this BpS are topkilled by fire (according to their respective Fire Effects Information System species reviews), Blankenship assumed that the modelers used mixed fire to represent a very patchy fire, but because where fire occurred it probably topkilled most plants, it met LANDFIRE’s replacement fire criteria.

The model was reviewed and accepted for map zone (MZ) 18 by Eric Limbach.

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 | A | A | A | UN | UN | UN | UN | UN |
| Herb | 0.5-1.0 | A | A | A | A | A | UN | UN | UN | UN | UN |
| Herb | >1.0 | A | A | A | A | A | UN | UN | UN | UN | UN |
| Shrub | 0-0.5 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Shrub | >3.0 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 0-5 | B | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | B | UN | UN | UN | UN | 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 18 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ARTR2 | Artemisia tridentata | Big sagebrush | Upper |
| HECO26 | Hesperostipa comata | Needle and thread | Upper |
| ACHY | Achnatherum hymenoides | Indian ricegrass | Lower |

Description

Perennial grasses and forbs dominate where woody shrub canopy has been topkilled/removed by wildfire. Shrub cover <5%.

*Maximum Tree Size Class*  
None

Class B 82 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ARTR2 | Artemisia tridentata | Big sagebrush | Upper |
| HECO26 | Hesperostipa comata | Needle and thread | Low-Mid |
| ACHY | Achnatherum hymenoides | Indian ricegrass | Lower |

Description

Shrubs are the upper-layer lifeform (5-25% cover) with diverse perennial grass and forb understory dominant.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Late1:OPN | 19 |
| Late1:OPN | 20 | 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 | 0.0083 | 120 | Yes | 0 |
| Replacement Fire | Late1:OPN | Late1:OPN | 0.0027 | 370 | No | 0 |
| Wind or Weather or Stress | Late1:OPN | Late1:OPN | 0.01 | 100 | No | 0 |
| Replacement Fire | Late1:OPN | Early1:OPN | 0.0106 | 94 | Yes | 0 |
| Insects or Disease | Late1:OPN | Late1:OPN | 0.013 | 77 | No | 0 |

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