

11350

Inter-Mountain Basins Semi-Desert Grassland

BpS Model/Description Version: Aug. 2020

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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	<i>Achnatherum hymenoides</i>	Indian ricegrass
HECO26	<i>Hesperostipa comata</i>	Needle and thread
LECI4	<i>Leymus cinereus</i>	Basin wildrye
ARTR2	<i>Artemisia tridentata</i>	Big sagebrush
GRSP	<i>Grayia spinosa</i>	Spiny hopsage
ATCA2	<i>Atriplex canescens</i>	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
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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
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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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