

11270

Inter-Mountain Basins Semi-Desert Shrub-Steppe

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Steppe/Savanna

Map Zones

21

Geographic Range

This ecological system occurs throughout the intermountain western US. In MZ21, it is uncommon to rare, maybe found in the southeastern corner of the zone.

Biophysical Site Description

Found at elevations ranging from 4,000-5,000ft. The climate where this system occurs is generally hot in summers and cold in winters with low annual precipitation, ranging from 5-10in and high inter-annual variation. Much of the precipitation falls as snow, and growing-season drought is characteristic. Temperatures are continental with large annual and diurnal variation. Sites are generally alluvial fans and flats with moderate to deep soils. Substrates are generally calcareous derived from alluvium, medium to coarse-textured alluvial soils. Soils may be alkaline and typically moderately saline (West 1983).

This group generally lies above salt desert shrub and below sagebrush types. Both to the north and upslope it is bordered by low elevation big sagebrush groups, commonly ARTRWY, ARAR8 and ARNO4 communities. To the south this group is bordered by Mojave Desert transition communities.

Vegetation Description

The plant associations in this system are characterized by a somewhat sparse to moderately dense (10-70% cover) shrub layer of *Grayia spinosa*, *Artemisia tridentata*, *Ephedra nevadensis*, *Ephedra viridis*, *Chrysothamnus viscidiflorus*, *Sarcobatus vermiculatus*, or *Atriplex canescens*. Shrub *Tetradymia canescens* may be occasionally present. The herbaceous layer is dominated by bunch grasses which occupy patches in the shrub matrix. The most widespread species are *Heterostipa comata* and *Achnatherum hymenoides*. Other locally dominant or important species include *Leymus cinereus*, *Pascopyrum smithii*, *Pleuraphis jamesii*, *Elymus lanceolatus*, *Elymus elymoides*, *Koeleria macrantha*, *Hesperostipa comata*, and *Poa secunda*. Forbs are generally of low importance and are highly variable across the range, but may be diverse in some occurrences. Species that often occur are *Astragalus*, *Oenothera*, *Eriogonum*, and *Balsamorhiza*. Mosses and lichens may be important ground cover.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
GRSP	<i>Grayia spinosa</i>	Spiny hopsage
TETRA3	<i>Tetradymia</i>	Horsebrush
ARTR2	<i>Artemisia tridentata</i>	Big sagebrush
ATCO	<i>Atriplex confertifolia</i>	Shadscale saltbush

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

Disturbance Description

Disturbance is unpredictable in these systems. However, drought, insects and fire may all occur here. Drought periods occurred approximately every 150yrs.

Documented Mormon cricket/grasshopper outbreaks since settlement have corresponded with drought; outbreaks cause shifts in composition amongst dominant species, but do not typically cause shifts to different seral stages. Therefore insect disturbance was not modeled. During outbreaks Mormon crickets prefer open, low plant communities. Herbaceous communities and the herbaceous component of mixed communities were more susceptible to cricket grazing.

Fire was infrequent and somewhat dependent on fire importation from the upper sagebrush zone. Replacement fire was the primary fire with mean FRI (200-300yrs) increasing with shrub development intermixed with grass.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	215	100	100	500
Moderate (Mixed)				
Low (Surface)				
All Fires	215	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

Grayia spinosa communities occupy a narrow elevation band that can be extensive in many valleys (>10,000ac). Disturbance scale was variable during pre-settlement. Droughts and extended wet periods could be region wide, or more local. A series of high water years or drought could affect whole basins.

Most fires were rare and less than one acre, but may have exceeded hundreds of acres with a good grass crop.

Adjacency or Identification Concerns

This BpS is transitional between salt desert shrub (1081) and Inter-Mountain Basins Big Sagebrush Shrublands (1080) and is truly considered a higher elevation type of salt desert shrublands. Intermingling of both ecological systems on different lifeforms and aspects on alluvial fans creates this BpS.

This ecological system contains the typical Great Basin salt desert shrub communities. Salt desert shrub is also common in the Wyoming big sagebrush community and there is some species overlap. A wide range of salt desert shrubs can occur in this group.

Indian ricegrass can dominate sites with sand sheets, or surfaces, however, the temporal nature of this condition is unknown.

Upland shrub communities are easily invaded and, in the short term at least, replaced by cheatgrass. Other nonnative problematic annuals include halogeton, Russian thistle, and several mustards. Through central UT and east central NV this group is susceptible to invasion by squarrose knapweed. More mesic areas can be invaded by tall whitetop and hoary cress. All three are noxious weeds in Great Basin states.

Issues or Problems

Native Uncharacteristic Conditions

Comments

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	A	A	A	A	A
Herb	0.5-1.0	A	A	A	A	A	A	A	A	A	A
Herb	>1.0	A	A	A	A	A	A	A	A	A	A
Shrub	0-0.5	B	B	B	B	B	B	B	B	B	B
Shrub	0.5-1.0	B	B	B	B	B	B	B	B	B	B
Shrub	1.0-3.0	B	B	B	B	B	B	B	B	B	B
Shrub	>3.0	B	B	B	B	B	B	B	B	B	B
Tree	0-5	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	5-10	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	10-25	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	25-50	B	B	B	B	B	UN	UN	UN	UN	UN
Tree	>50	B	B	B	B	B	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	20	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
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ACHY	Achnatherum hymenoides	Indian ricegrass	Mid-Upper
HECO26	Hesperostipa comata	Needle and thread	Upper
GRSP	Grayia spinosa	Spiny hopsage	Lower

Description

Dominated by continuous Indian ricegrass with widely scattered and relatively younger shrubs. Shrub cover within the first 20yrs, might be between 10-20%, max.

Maximum Tree Size Class

None

Class B 80 Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
GRSP	Grayia spinosa	Spiny hopsage	Upper
ARTR2	Artemisia tridentata	Big sagebrush	Upper
ACHY	Achnatherum hymenoides	Indian ricegrass	Lower

Description

Discontinuous grass patches, and higher shrub canopy cover. Spiny hopsage dominates.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	19
Mid1:OPN	20	Mid1: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:ALL	Early1:ALL	0.003	333	Yes	0
Wind or Weather or Stress	Early1:ALL	Early1:ALL	0.0067	149	Yes	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.0067	149	Yes	0

References

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