

10660

Inter-Mountain Basins Mat Saltbush Shrubland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zones

29

Geographic Range

Occurs throughout MZ22 in areas with <10in precipitation (none of the subsections that are part of M331; Cleland et al. 2007)

In MZ29, 1081/1066 would occur around 331Nb, c, and very southern portion of 331Kf near WY border. Also along MT and WY border around 331Gf. In the Pryor Mtns and Red Desert.

Biophysical Site Description

This type occurs from lower slopes to valley bottoms ranging in elevation from 4,300-6,500ft. Soils are often alkaline or calcareous. Soil permeability ranges from high to low, with more impermeable soils occurring in valley bottoms. Soil texture is variable becoming finer toward valley bottoms. Many soils are derived from colluvium on slopes and residual soils elsewhere. There may be water ponds on alkaline bottoms. Average annual precipitation ranges from 5-10in. Summers are hot and dry. Spring is the only dependable growing season with moisture both from winter and spring precipitation. Cool springs can delay the onset of plant growth and drought can curtail the length of active spring growth. Freezing temperatures are common between October and April.

This group generally lies above playas and lakes. It tends to be the lowest vegetation group in elevation. Upslope it is bordered by and can intergrade with low elevation big sagebrush groups, commonly Wyoming big sagebrush, low sagebrush, black sagebrush communities and sometimes juniper woodland.

Vegetation Description

This ecological system includes low (less than three feet) and medium-sized shrubs found widely scattered (often 20-30ft apart), to high density (3-4 plants per sq. m) shrubs interspersed with low to mid-height bunch grasses. Common shrubs are shadscale, winterfat, budsage, fourwing saltbush, Wyoming big sagebrush, spiny horsebrush, low rabbitbrush, broom snakeweed and spiny hopsage. Some of these will dominate more than others depending on the site.

(Originally in 1085 - but moved to this BpS: Minor brush components would include greasewood, salt brush and rabbitbrush. Rabbitbrush is dominant in MZs 29 and 30. In MZ30, patches of stands are dominated by one or more of these shrubs.)

Common grass species are Indian ricegrass, needle-and-thread, western wheatgrass, three-awn and Sandberg bluegrass. Prickly pear cactus, hood's phlox, scarlet globemallow, wild onion, Hooker's sandwort and Sego lily are the most common and widespread forbs. The variably abundant understory grasses and forbs are salt and drought tolerant. The relative abundance of species may vary in a patchwork pattern across the landscape in relation to subtle differences in soils and reflect variation in disturbance history.

Achnatherum hymenoides is also a dominant.

Total cover rarely exceeds 25% and annual production is closely linked to prior 12 months' precipitation.

Stand replacing disturbances (insects, extended wet periods and drought) shift dominance between shrub and grass species. Following drought, the system will tend more toward class B (more shrub prevalence). Following fire and extended wet periods, the system will tend more toward class A (greater grass prevalence).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
ATCO	<i>Atriplex confertifolia</i>	Shadscale saltbush
PIDE4	<i>Picrothamnus desertorum</i>	Bud sagebrush
KRLA2	<i>Krascheninnikovia lanata</i>	Winterfat
ATCA2	<i>Atriplex canescens</i>	Fourwing saltbush
TETRA3	<i>Tetradymia</i>	Horsebrush
CHVI8	<i>Chrysothamnus viscidiflorus</i>	Yellow rabbitbrush
ACHY	<i>Achnatherum hymenoides</i>	Indian ricegrass
GRSP	<i>Grayia spinosa</i>	Spiny hopsage

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

Disturbance Description

Under reference conditions disturbances were unpredictable, but abnormally high precipitation, drought, insects and fire may all occur in these systems. Extended wet periods tended to favor perennial grass development, while extended drought tended to favor shrub development.

Documented Mormon cricket/grasshopper outbreaks since settlement were associated 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. Consequently, herbaceous communities and the herbaceous component of mixed communities were more susceptible to cricket grazing.

Fire was rare and limited to more mesic sites (and moist periods) with high grass productivity.

Reviewers for MZ16 indicated that there is no evidence for fire in salt desert shrub during pre-settlement. Research from the USFS Desert Experimental Range supports this and indicates that the reference condition would have been shifting mosaics of communities based on drought, flooding and insect outbreaks. Although historic fire regimes in desert shrublands are difficult to quantify, West (1983) believes that on sparsely vegetated salt-desert types, fires were historically rare except under unusual circumstances such as following high precipitation years.

Native American manipulation of salt desert shrub plant communities was minimal. Grass seed may have been one of the more important salt desert shrub crops. It is unlikely that native Americans manipulated the vegetation to encourage grass seed.

Stand replacing disturbances (insects, extended wet periods and drought) shift dominance between shrub and grass species. Following drought, the system will tend more toward class B (more shrub prevalence). Following fire and extended wet periods, the system will tend more toward class A (greater grass prevalence).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	438	100		
Moderate (Mixed)				
Low (Surface)				
All Fires	438	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

This type occurs in patches of less than one acre to hundreds of acres in size. Disturbance scale was variable during pre-settlement. Droughts and extended wet periods could be region-wide, or more local. A series of high precipitation years or drought could affect whole basins.

Mormon cricket disturbances could affect hundreds of acres for years to 1-2 decades. Most fires were rare and less than one acre, but may exceed hundreds of acres with a good grass crop.

Adjacency or Identification Concerns

This BpS 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 with other BpS. A wide range of salt desert shrubs can occur in this group. This could be confused with 1125, since Wyoming big sagebrush is a component. This can also be confused with 1072.

Upland salt desert shrub communities are potentially invaded by cheatgrass which could lead to more frequent fire intervals. Other nonnative problematic annuals include Japanese brome, halogeton (not necessarily in MZ29), Russian thistle (not necessarily in MZ29) and several mustards.

There are, however, still salt-desert shrublands in the western United States experiencing historic fire regimes. For example, the well-studied salt-desert communities of Raft River Valley, southwestern ID, have not experienced fire since at least the 1930s. The vegetation community changes of this area have been monitored since 1951 (see

<http://www.cnrhome.uidaho.edu/default.aspx?pid=81934>) with the last photo-documentation done in 2002 showing a significant cheatgrass component.

In MZ29, cheatgrass might not be as significant a component.

This system would not show much, if any, departure.

Plains shrubland has more mesic shrubs, whereas the salt desert shrub is more xeric - thus found in the Badlands and salt-affected soils. The FRI of salt-shrubs would be much longer.

Issues or Problems

Lack of references limited model development. Reviewers for MZ16 indicated that there is no evidence for fire in salt desert shrub during pre-settlement. Research from the USFS Desert Experimental Range supports this and indicates that the reference condition would have been shifting mosaics of communities based on drought, flooding and insect outbreaks. There was little to no information about the early successional species and their relationships in this system prior to the advent of aggressive and noxious non-natives. Because of the pervasive replacement of native, early successional species by non-natives, an adequate description of the forb and grass early seral communities may be difficult to complete.

Since disturbance is rare and unpredictable, the disturbance and successional pathways were difficult to model.

Native Uncharacteristic Conditions

Over 30% shrub cover would be uncharacteristic.

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	UN	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	B	B	B	UN	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	B	B	B	UN	UN	UN	UN	UN	UN	UN
Shrub	>3.0	B	B	B	UN	UN	UN	UN	UN	UN	UN
Tree	0-5	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	5-10	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	10-25	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	25-50	UN	UN	UN	UN	UN	UN	UN	UN	UN	UN
Tree	>50	UN	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 25 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ACHY	Achnatherum hymenoides	Indian ricegrass	Lower
ATCO	Atriplex confertifolia	Shadscale saltbush	Upper

Description

Dominated by continuous grass with widely scattered shrubs and relatively younger shrubs. Shrubs are the upper level lifeform at <5% and <0.5m tall.

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Maximum Tree Size Class

None

Class B 75 Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ATCO	Atriplex confertifolia	Shadscale saltbush	Upper
ACHY	Achnatherum hymenoides	Indian ricegrass	Lower

Description

Discontinuous grass patches, and higher shrub canopy cover.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	9
Mid1:OPN	10	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	0.03	33	Yes	0
Replacement Fire	Mid1:OPN	Early1:ALL	0.002	500	Yes	0
Wind or Weather or Stress	Mid1:OPN	Mid1:OPN	0.03	33	No	0
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.03	33	Yes	0

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