11530
Inter-Mountain Basins Greasewood Flat

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Vegetation Type
Mixed Upland and Wetland

Map Zones
16, 23, 24, 25, 27

Geographic Range
Occurs throughout much of the western United States in intermountain basins and extends onto the western Great Plains. In New Mexico, it is thought that this system occurs north and west of map zone (MZ) 27 but not IN MZ27.

In the Central Shortgrass Prairie ecoregion, occurrences are primarily in the southwestern portion of the ecoregion. Large occurrences are also found in the lower elevations of Colorado's western valleys and throughout much of the San Luis Valley (Colorado Natural Heritage Program 2006).

Biophysical Site Description
Typically occurs near drainages and on stream terraces and flats or may form rings around more sparsely vegetated playas. Sites typically have saline soils and a shallow water table, and flood intermittently but remain dry for most growing seasons. The water table remains high enough to maintain vegetation, despite salt accumulation. Composition and density of the shrub and understory species vary with depth to water table, salinity and alkalinity, soil texture, and past land use or disturbance (Colorado Natural Heritage Program 2006).

Vegetation Description
This system sometimes occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by *Sarcobatus vermiculatus* (greasewood). *Atriplex confertifolia* (shadscale) or *Krascheninnikovia lanata* (winterfat) may be present or co-dominant. Occurrences are often surrounded by mixed salt desert scrub. An herbaceous layer, if present, is usually dominated by graminoids. There may be inclusions of *Sporobolus airoides* (alkali sacaton), *Distichilis spicata* (saltgrass), or *Eleocharis palustrus* (spikerush).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SARCO	*Sarcobatus*	Greasewood

DISTI	*Distichlis*	Saltgrass
LECI4	*Leymus cinereus*	Basin wildrye
SPAI	*Sporobolus airoides*	Alkali sacaton
ATCO	*Atriplex confertifolia*	Shadscale saltbush

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

Disturbance Description

Historically, fire was extremely infrequent. Greasewood may be killed by standing water that lasts greater than 40days. Greasewood is a vigorous resprouter after low- to moderate-severity fires, although severe fires may result in some mortality. Some re-seeding may occur from nearby remnant plants. Severe drought impacts greasewood communities by lowering the water table, and mortality may result.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	204	100	100	800
Moderate (Mixed)				
Low (Surface)				
All Fires	204	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

Tens to hundreds of acres

Adjacency or Identification Concerns

Greasewood communities are susceptible to invasion by non-native annual grasses (cheatgrass and red brome). Cheatgrass and red brome invasion have resulted in greater fire frequencies.

Occurrences may be surrounded by grasslands, stabilized sand dunes, wet-meadow systems, mixed salt desert scrub, sand sage, or shortgrass prairie (Colorado Natural Heritage Program 2006). Greasewood flats are typically found near drainages on stream terraces and flats and on alluvial fans along streams or arroyos, or they may form rings around playas.

Issues or Problems

There was some question about whether flooding in Class C (Late Development) would send the entire system back to Class A (Early Development), or Class B (Mid Development). As a compromise, flooding was attributed to take both pathways with equal probability.

There is conflicting evidence about mean fire return interval (MFRI) in this system. Anderson (2004) claims an FRI of <100yrs, whereas expert opinion considers fire rare to absent in greasewood. As a compromise, an MFRI of 200yrs was chosen. This biophysical setting (BpS) may not occur or is minor in MZ25.

Native Uncharacteristic Conditions

Comments

MZs 16, 23, 24, 25, and 27 were combined during the 2015 BpS Review because the comments and LANDFIRE review indicated the models were duplicate, with only minor differences in the description (as noted) and the s-class mapping rules. S-class rules from MZs 25 and 27 were used in the combined description because they were mutually exclusive.

MZs 16, 23, and 24 did not receive any peer review. For MZ25, this model was reviewed by Christiansen and Schulz. Christiansen recommended keeping the flooding compromise as discussed in the issues section. No review was sought for MZ27 because it was thought this system did not occur in MZ27.

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	A	A	B	B	B	B	C	C	C	C
Shrub	0.5-1.0	A	A	B	B	B	B	C	C	C	C
Shrub	1.0-3.0	A	A	B	B	C	C	C	C	C	C
Shrub	>3.0	A	A	B	B	C	C	C	C	C	C
Tree	0-5	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	5-10	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	10-25	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	25-50	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	>50	C	C	C	C	C	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 3 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
DISTI	Distichlis	Saltgrass	Lower
LECI4	Leymus cinereus	Basin wildrye	Lower
SPAI	Sporobolus airoides	Alkali sacaton	Lower
SARCO	Sarcobatus	Greasewood	Upper

Description

Some grasses, with greasewood sprouts present. Some representation of other sprouting species may be present (creosotebush, rabbitbrush). Grass species vary geographically, but include the following for Utah and Nevada: inland saltgrass, bottlebrush squirreltail, Sandberg bluegrass, and alkali sacaton.

Maximum Tree Size Class
None

Class B 29 Mid Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SARCO	Sarcobatus	Greasewood	Upper
DISTI	Distichlis	Saltgrass	Lower
SPAI	Sporobolus airoides	Alkali sacaton	Lower
LECI4	Leymus cinereus	Basin wildrye	Lower

Description
Greasewood shrubs are maturing, with a good mix of perennial grasses. Other shrub species that may be found with greasewood include creosotebush and rabbitbrush. In transition zones to Mojave Desert, it may occur with various sagebrush species and salt desert shrub vegetation (shadscale, saltbushes, winterfat, bud sage, and spiny hopsage).

Maximum Tree Size Class
None

Class C 68 Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SARCO	Sarcobatus	Greasewood	Upper
DISTI	Distichlis	Saltgrass	Lower
SPAI	Sporobolus airoides	Alkali sacaton	Lower
LECI4	Leymus cinereus	Basin wildrye	Lower

Description
Greasewood shrubs have reached maturity and increase canopy closure. Perennial grasses will still be in the understory.

Maximum Tree Size Class
None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	2
Mid1:OPN	3	Late1:OPN	20
Late1:OPN	21	Late1:OPN	520

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	Mid1:OPN	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Mid1:OPN	Early1:ALL	0.013	77	Yes	0
Replacement Fire	Late1:OPN	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Late1:OPN	Mid1:OPN	0.0075	133	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:ALL	0.0075	133	Yes	0

References

Anderson, M.D. 2004. Sarcobatus vermiculatus. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, February 22].

Blaisdell, J.P. and R.C. Holmgren. 1984. Managing intermountain rangelands-salt-desert shrub ranges. General Technical Report INT-163. USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT. 52 pp.

Colorado Natural Heritage Program. 2006. Central Shortgrass Prairie Ecoregional Assessment: Terrestrial Ecological Systems Descriptions and Integrity Guidelines of the Central Shortgrass Prairie Ecoregion.

Knight, D.H. 1994. Mountains and plains: Ecology of Wyoming landscapes. Yale University Press, New Haven, MA. 338 pp.

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

Risser, P.G. 1990. Landscape processes and the vegetation of the North American grassland. Pages 133-146 in: S.L. Collins and L.L. Wallace, eds. Fire in North American tallgrass prairies. Norman, OK: University of Oklahoma Press.

West, N.E. 1983b. Intermountain salt desert shrublands. Pages 375-397 in: N.E. West, editor. Temperate deserts and semi-deserts. Ecosystems of the world, Volume 5. Elsevier Publishing Company, Amsterdam.