

11003

Chihuahuan Mixed Desert and Thorn Scrub - Steppe

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Steppe/Savanna

Map Zone

25

Geographic Range

Mixed grassland (black grama, bush muhly, and tobosa) and desert shrub (creosotebush, tarbush, and mariola) occur on upper to middle bajada, gravelly soils, and dissected, gravelly alluvial fans.

Biophysical Site Description

This system occurs on bajadas and into the foothills in the Chihuahuan Desert. Substrates are generally coarse-texture, gravelly soils and may have a petrocalcic layer. This site exhibits a high degree of topographic diversity, including limy uplands.

Vegetation Description

This Chihuahuan Desert ecological system is the creosotebush mixed-desert shrub steppe that is thought to have occurred in pre-settlement times on upper bajada gravelly soils and dissected alluvial fans. It is distinct from creosotebush shrubland on similar sites because this is a desert shrub characterized by perennial grasses (typically black grama). Vegetation is characterized by an herbaceous layer dominated by black grama with an open shrub layer. Associated shrubs include *Krameria erecta*, *Koeberlina spinosa*, *Parthenium incanum*, and *Baccharis pteronioides*, or *Rhus microphylla* (in drainages). Stands of *Acacia constricta*- or *Acacia neovernicosa*-dominated thornscrub are included in this biophysical setting (BpS), and limestone substrates appear important for at least these species. Grasses such as *Aristida* spp., *Bouteloua eriopoda*, *Muhlenbergia proteri*, *Bothriochloa babinodis*, and *Digitaria californica* may be common.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
BOER4	<i>Bouteloua eriopoda</i>	Black grama
MUPO2	<i>Muhlenbergia porteri</i>	Bush muhly
SPCR	<i>Sporobolus cryptandrus</i>	Sand dropseed
SPFL2	<i>Sporobolus flexuosus</i>	Mesa dropseed
LATR2	<i>Larrea tridentata</i>	Creosotebush
FLCE	<i>Flourensia cernua</i>	American tarwort
PAIN2	<i>Parthenium incanum</i>	Mariola

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

Disturbance Description

Most desert fires are infrequent and of low severity. Drought may be a more significant factor than fire in this model. Standing biomass, deadwood, and leaf litter can fuel desert fires following rainy seasons. Historical fire regimes on gravelly soils, with mixed grassland/desert shrub, are difficult to quantify, but fires were historically rare except under unusual circumstances.

Fire Frequency

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

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

1,000-500,000ac

Adjacency or Identification Concerns

Another BpS occurs in this area, Chihuahuan Mixed Desert Shrubland (BpS11005), and is very similar to this BpS, but is difficult to separate.

Issues or Problems

Fire ecology studies at the population level are badly needed for black grama. Historical fire regimes in this BpS are difficult to quantify.

Native Uncharacteristic Conditions

Historically, creosote-dominated stands would not occur in this BpS. This condition is included in another BpS (Chihuahuan Mixed Desert and Thorn Scrub – Shrubland BpS 11002), which contains inclusions of Appacherian-Chihuahuan Mesquite Upland Scrub (1095).

Comments

Prior to LANDFIRE Remap this BpS was named Chihuahuan Grama Grass-Creosote Steppe.

For LANDFIRE National, this model was developed in a workshop and had input from David Anderson (White Sands Missile Range) and Brandon Bestlemyer (ARS, Joronado). Mike Babler adjusted the percentages in classes to better reflect VDDT results based on disturbance probabilities specified in the class descriptions. Class A was reduced from 25% to 20%. Class B increased from 75% to 80%. Modelers included no fire in model.

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	B	B	B	B	B	B	B	B
Herb	0.5-1.0	A	A	B	B	B	B	B	B	B	B

Herb	>1.0	A	A	B	B	B	B	B	B	B	B
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	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 leaf form 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 17 Early Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BOER4	Bouteloua eriopoda	Black grama	Upper
MUPO2	Muhlenbergia porteri	Bush muhly	Upper

Description

Under natural conditions, shrub cover represents <10% canopy cover and is likely not affected by disturbance. The grass community may be as low as 10% canopy cover after a combination of drought/fire. In the historical condition, in which invasive annual grasses are absent, the fire return interval is virtually nonexistent, except for areas near the base of mountains experiencing locally higher rainfall and fine fuel buildup. However, if the upper soil horizon and/or microbes are lost, then a longer recovery time is required, or complete recovery is not possible.

Maximum Tree Size Class

None

Class B 83 Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BOER4	Bouteloua eriopoda	Black grama	Upper
MUPO2	Muhlenbergia porteri	Bush muhly	Upper

Description

Typically, <10% shrub canopy cover and as much as 40% grass and forb canopy cover; associated with more productive soils. Grasses characteristically dominate shrub layer.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Late1:OPN	99
Late1:OPN	100	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
Optional 2	Early1:OPN	Early1:OPN	0.02	50	No	0
Optional 1	Late1:OPN	Early1:OPN	0.002	500	Yes	0
Wind or Weather or Stress	Late1:OPN	Late1:OPN	0.0125	80	No	0

Optional Disturbances

Optional 1: Replacement fire followed by severe drought

Optional 2: Drought

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