

10770

Chihuahuan Succulent Desert Scrub

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zones

25, 26

Geographic Range

This ecological system is found in the Chihuahuan and Sonoran deserts.

Biophysical Site Description

This system occurs on sparse rocky sites and on bare ground on colluvial slopes, upper bajadas, side slopes, ridges, canyons, hills, and mesas. Sites are hot and dry. Gravel and rock are often abundant on the ground surface. Grass-dominated stands occur on more mesic sites such as northerly aspects whereas shrub- or succulent-dominated stands are on the more arid southerly slopes.

Vegetation Description

Vegetation is characterized by the relatively high cover of succulent species such as ocotillo (*Fouquieria splendens*), cactus (*Ferocactus* spp.), Englemann's prickly pear (*Opuntia engelmannii*), tree cholla (*O. imbricate*), cane cholla (*O. spinosior*), banana yucca (*Yucca baccata*), and many others. Perennial grass cover is typically high on the northern aspects and much lower on the southern aspects. The abundance of succulents is diagnostic of this desert scrub system, but scattered desert shrubs are usually present. There is a high degree of variability in species diversity and composition within this system with changes in elevation and longitude and latitude. This system does not include desert grasslands or shrub-steppe with a strong cacti component. In the Chihuahuan Desert, lechuguilla (*Agave lechuguilla*) dominates as the major succulent.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
BOCU	<i>Bouteloua curtipendula</i>	Sideoats grama
BOER4	<i>Bouteloua eriopoda</i>	Black grama
ARIST	<i>Aristida</i>	Threeawn
FOSP2	<i>Fouquieria splendens</i>	Ocotillo
MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	Catclaw mimosa
OPEN3	<i>Opuntia engelmannii</i>	Cactus apple
DAWH2	<i>Dasyllirion wheeleri</i>	Common stool

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

Disturbance Description

Fire is infrequent. Extended drought could set back to Class A. Fire following wet seasons may occur. Adjacent grassland or desert scrub may carry fire into this Biophysical Setting (BpS). Fires in general are not prevalent over much of the south-facing slopes. Fire occurrence is variable due to variability in species composition (see Vegetation Description). Thomas has estimated that fire frequency in the Sonoran Desert is over 250yrs but has cited references suggesting that fire intervals in adjacent desert grasslands may be as short as 3-40yrs. A large portion of this mapping unit is found in the Chihuahaun Desert. The estimate of fire return intervals is based on expert opinion.

Fire Frequency Results

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

Scale Description

Can be small patches (<1.0ha) ranging to large patches (>1000ha), could be linear along rock ridges in bands.

Adjacency or Identification Concerns

A high canopy cover of perennial grasses (>20%) may indicate the system is either Apacherian Chihuahuan Semi-Desert Grassland and Steppe or Chihuahaun Gypsophilous Grassland and Steppe. These two types may be very difficult to detect via remote sensing.

Issues or Problems

Our familiarity with this system in New Mexico indicates that it would be possible to combine with the Apacherian Chihuahaun Semi-Desert Grassland and Steppe. Due to our unfamiliarity with these systems in Arizona and the Sonoran Desert, we are reluctant to combine them.

Native Uncharacteristic Conditions

If there is a high canopy cover of perennial grasses (>20%), the system may be Apacherian Chihuahuan Semi-Desert Grassland and Steppe. These two types may be very difficult to detect via remote sensing.

Comments

This was based on 1410770. Descriptions and models for map zone (MZ) 25 and MZ26 are identical, copied from MZ26.

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	A	A	A	A	A	A	A	A
Shrub	0.5-1.0	A	A	A	A	A	A	A	A	A	A
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 11 Early Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
ARIST	Aristida	Threeawn	Middle
BOCU	Bouteloua curtipendula	Sideoats grama	Middle
FOSP2	Fouquieria splendens	Ocotillo	Upper
AGLE	Agave lechuguilla	Lechuguilla	Middle

Description

Annual herbaceous vegetation, bare ground, and rock. Perennial grass seedlings established. Fire does not occur in this class.

Maximum Tree Size Class

None

Class B 89 Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
BOCU	Bouteloua curtipendula	Sideoats grama	Middle
BOER4	Bouteloua eriopoda	Black grama	Middle
FOSP2	Fouquieria splendens	Ocotillo	Upper
OPEN3	Opuntia engelmannii	Cactus apple	Mid-Upper

Description

Higher density of perennial grasses and succulents. Succulents are reproducing. High-moisture seasons may produce perennial/annual herbaceous vegetation. Infrequent replacement fire and wind/weather/stress will cause a transition to Class A.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Late1:OPN	10
Late1:OPN	11	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
Wind or Weather or Stress	Late1:OPN	Early1:OPN	0.005	200	Yes	0
Replacement Fire	Late1:OPN	Early1:OPN	0.007	143	Yes	0

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