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 lechugilla*) dominates as the major succulent.

BpS Dominant and Indicator Species

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

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**

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

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

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

Probabilistic Transitions

References

Brown, J.K. and J. Kapler-Smith, eds. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42. vol 2. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. 257 pp.

Dick-Peddie, W.A. 1993. New Mexico vegetation: Past, present, and future. Albuquerque, NM: University of New Mexico Press. 244 pp.

Henrickson, J. and M.C. Johnston. 1986. Vegetation and community types of the Chihuahuan Desert. Pages 20-39 in: J.C. Barlow, A.M. Powell and B.N. Timmermann, eds. Chihuahuan Desert--U.S. and Mexico, II: Proceedings of the 2nd symposium on resources of the Chihuahuan Desert region; 1983 October 20-21; Alpine, TX. Alpine, TX: Sul Ross State University, Chihuahuan Desert Research Institute.

Kuchler, A.W. 1964. Manual to accompany the map of potential natural vegetation of the conterminous United States. American Geographical Society. Spec. Publ. NO. 36. Lib. Congress Cat. Card Num. 64-15417.

Matthews, R.F. 1994. Fouquieria splendens. 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, September 26].

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

Paysen, T.E., J.R. Ansley, J.K. Brown, G.J. Gottfried, S.M. Haase, M.J. Harrington, M.G. Narog, S.S. Sackett and R.C. Wilson. 2000. Fire in western shrubland, woodland, and grassland ecosystems. Pages 121-160 in: J.K. Brown and J. Kapler-Smith, eds. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. 257 pp.

Thomas, P.A. 1991. Response of succulents to fire: a review. International Journal of Wildland Fire 1(1): 11-22.

USDA-NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USGS National Gap Analysis Program. 2004. Provisional Digital Land Cover Map for the Southwestern United States. Version 1.0. RS/GIS Laboratory, College of Natural Resources, Utah State University.

West, N.E. 1983. Intermountain salt-desert shrubland. pages 375-397 in: N.E. West, ed. Temperate deserts and semi-deserts. New York: Elsevier Scientific Publishing Company. (Goodall, David W., ed. in chief.; Ecosystems of the world; vol. 5).