11210

Apacherian-Chihuahuan Semi-Desert Grassland and Steppe

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Vegetation Type

Steppe/Savanna

Map Zones

26

Geographic Range

Borderland of Arizona, New Mexico, Texas and northern Mexico. Extends from Sonoran Desert, to the Mogollon Rim and much of the northern Chihuahuan Desert. In map zone (MZ) 34 this Biophysical Setting (BpS) reaches the Permian Basin. Any incursion into MZ34 is marginal at best (ECOMAP Subsections 315Bb, 315Ba and 315Cd; Cleland et al. 2007). In MZ26 this type may occur in ECOMAP subsections 315Bb, 315Ba and 315Cd.

Biophysical Site Description

Gently sloping, on mesas, foothill slopes, piedmonts, narrow fingered draws and loamy broad swales at 1,100-1,800m elevation. In Trans-Pecos Texas this grassland typically occurs on acidic igneous substrate, but may also occur on limestone and deep gravelly substrates. At lower elevations, grasslands of this type may be dominated by Chino grama (*Bouteloua ramosa*), and are known as chino grasslands. Chino grasslands are included here but are fairly limited in geographic extent and likely have a different fire regime. Higher elevations are dominated by other grama species. Also, in the Trans-Pecos it is unclear that this occupies the loamy swales described for the MZ25 model.

Vegetation Description

Perennial grasses, herbs with shrubs as the upper life form. Perennial grass dominated with scattered shrubs. Perennial herbaceous cover values range from 16-25%. Bare ground can make up 50% of the ground cover, but in some situations bare ground may be minor. Bare ground patch sizes should be small, e.g., <0.5 meters in diameter.

Grama grasses (*Bouteloua* spp) frequently dominate the herbaceous layer with *Bouteloua ramosa* occurring at lower elevations in some situations and *B. eriopoda* and *B. curtipendula* at higher elevations. Shrub component includes *Ephedra* spp, *Yucca* spp and sotol (*Dasylirion* spp).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| BOER4 | Bouteloua eriopoda | Black grama |
| BOGR2 | Bouteloua gracilis | Blue grama |
| BOCU | Bouteloua curtipendula | Sideoats grama |
| BORA4 | Bouteloua ramosa | Chino grama |
| MUPO2 | Muhlenbergia porteri | Bush muhly |
| LATR2 | Larrea tridentata | Creosote bush |
| DALE2 | Dasylirion leiophyllum | Green sotol |

Disturbance Description

One camp believes that fire has a major impact in these systems. There is another camp that believes that fire is less important in the control of woody species than maintenance of perennial grass cover in the systems. Historical fire data in this system is lacking. It is uncertain what role fire plays in maintaining these systems.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 15 | 71 |  |  |
| Moderate (Mixed) | 37 | 29 |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 11 | 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

1,000 to 100,000 of ha

Non-Fire Disturbances

Wind/Weather/Stress

Adjacency or Identification Concerns

NRCS Ecological Site Descriptions are SD-2 Draw, Loamy and Gravelly Loam. Excludes SD-2 Limy which may be more similar in vegetation and disturbance dynamics to SD-2 Gravelly and to the MZ15 Grama Creosote BpS. The SD-2 Bottomland is also excluded from this BpS.

Issues or Problems

Moisture following fire has significant impact on plant response/recovery.

Native Uncharacteristic Conditions

Currently, in the Permian Basin much of this type is mesquite and creosote brushland.

Comments

For MZ26, this model was initiated from MZ25 BpS 1121. Significant changes to the MZ25 model resulted in a change in modelership for MZ26. Significant changes in Steve Bumgarner and Phil Smith model from MZ25 made by B. Warnock, J. Karges and C. Shackelford.

It may be useful to separate similar sites found in Arizona into their own BpS. In Texas this may also be too broadly defined with a broad elevational gradient and including savanna (*Q. emoryi/ Muhlenbergia emerslyi* woodland) at the higher elevations. It is unclear whether these savanna types are successionally related to the grasslands are stable types at higher more mesic sites.

Succession Classes

**Mapping Rules**

**Canopy Cover**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Lifeform** | **Height (m)** | **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 | UN | UN | UN | UN | UN |
| Herb | 0.5-1.0 | A | A | B | B | B | UN | UN | UN | UN | UN |
| Herb | >1.0 | A | A | B | B | B | UN | UN | UN | UN | UN |
| Shrub | 0-0.5 | B | C | C | C | C | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | B | C | C | C | C | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | B | C | C | C | C | UN | UN | UN | UN | UN |
| Shrub | >3.0 | B | C | C | C | C | UN | UN | UN | UN | UN |
| Tree | 0-5 | C | C | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | C | C | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | C | C | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | C | C | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | C | C | UN | UN | UN | UN | UN | UN | UN | UN |

Class A 33 Early Development 1 - Open

Structural Information

Tree Size Class: None

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOER4 | Bouteloua eriopoda | Black grama | Upper |
| BOGR2 | Bouteloua gracilis | Blue grama | Upper |
| BOCU | Bouteloua curtipendula | Sideoats grama | Upper |

Description

Grass and herbs (length predicated on moisture regime). Early succession post fire grass and herb community. This class encompasses the time period required to recover sufficient fuel loads to carry fire. Perennial bunch grasses, annual grass and herb community. Upper layer of shrubs, canopy cover <5%.

Class B 66 Mid Development 1 - Open

Structural Information

Tree Size Class: None

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOER4 | Bouteloua eriopoda | Black grama | Middle |
| BOGR2 | Bouteloua gracilis | Blue grama | Middle |
| BOCU | Bouteloua curtipendula | Sideoats grama | Middle |
| KOSP | Koeberlinia spinosa | Crown of thorns | Upper |

Description

Perennial grass with some low shrubs. Perennial bunch grasses regenerated and young shrubs begin growing. Shrubs may be present at 0-10% canopy cover, <1m tall.

Class C 1 Mid Development 2 - Open

Structural Information

Tree Size Class: None

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| BOER4 | Bouteloua eriopoda | Black grama | Middle |
| BOGR2 | Bouteloua gracilis | Blue grama | Middle |
| BOCU | Bouteloua curtipendula | Sideoats grama | Middle |
| KOSP | Koeberlinia spinosa | Crown of thorns | Upper |

Description

Shrubs continue to increase in size and/or number of individuals. Species are perennial bunch grasses and shrubs. Canopy cover of shrubs is 10-20%. (Shrub cover will be similar to species composition found in the Ecological System, Apacherian-Chihuahuan Mesquite Upland Scrub). Shrub species diversity increases. Perennial grass species dominate with 10-35% canopy cover; 1-2m height. Class C can be distinguished from Class B by the increase in shrubs.

Wind/weather/stress is used to represent drought.

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPEN | 0 | Mid1:OPEN | 5 |
| Mid1:OPEN | 6 | Mid2:OPEN | 50 |
| Mid2:OPEN | 51 | Mid2:OPEN | 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 | Mid1:OPEN | Early1:OPEN | 0.1 | 10 | Yes | 0 |
| Mixed Fire | Mid1:OPEN | Mid1:OPEN | 0.04 | 25 | No | 0 |
| Wind or Weather | Mid1:OPEN | Mid1:OPEN | 0.033 | 30 | No | 0 |
| Replacement Fire | Mid2:OPEN | Early1:OPEN | 0.0667 | 15 | Yes | 0 |
| Mixed Fire | Mid2:OPEN | Mid1:OPEN | 0.04 | 25 | Yes | 0 |
| Wind or Weather | Mid2:OPEN | Mid2:OPEN | 0.033 | 30 | No | 0 |

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