15040

Chihuahuan-Sonoran Desert Bottomland and Swale Grassland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Mixed Upland and Wetland

Map Zones

32, 35

Geographic Range

Generally associated with flats, swales, and bottomlands. Valley bottoms throughout much of Trans-Pecos and beyond, such as Marfa grasslands, Marathon Basin, and around Valentine. South to central Chihuahua and Coahuila.

Biophysical Site Description

Desert grassland with extensive clayey bottomland plains and intermittently flooded swales where salts do not accumulate to appreciable levels. On Clay Flat (Desert Grassland) range site. Gilgai topography may be present. Topographic position and soil texture control this system.

Vegetation Description

Clear dominant is tobosa grass (*Pleuraphis mutica*), with culms rising to only about 3-5dm. Historically, other grama species present, but soil movement (shrink/swell) gave disadvantage under grazing and grama decreases. Only shrubs include tree cholla (*Opuntia imbricata*), soaptree yucca (*Yucca elata*), and scattered honey mesquite (*Prosopis glandulosa*). Other grasses may include buffalograss (*Buchloe dactyloides*), vine mesquite (*Panicum obtusum*), Arizona cottontop (*Digitaria californica*), grama (*Bouteloua* spp.), dropseed (*Sporobolus* spp.), and tridens (*Tridens* spp.). *Pleuraphis* may form huge clones to 0.5 km2.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| PLMU3 | *Pleuraphis mutica* | Tobosagrass |
| OPIM | *Opuntia imbricata* | Tree cholla |
| YUEL | *Yucca elata* | Soaptree yucca |

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

Disturbance Description

Periodic flooding. Continuous fuel means that once a fire starts, generally the entire occurrence will burn. Adjacent types to this system generally have lower fuel loads and are less likely to carry fire than this system. Post-fire response is good, with deep roots and rapid green-up.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 10 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 10 | 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

Hundreds of hectares. This type is concentrated in broad valley bottoms of southern New Mexico, southeast Arizona, and Trans-Pecos Texas and often in linear drainage settings and flats.

Adjacency or Identification Concerns

Flats may intergrade downslope to alkali flats and upslope to Apacherian-Chihuahuan Semi-Desert Grasslands. This system (swales, flats, and bottomlands) does receive periodic flooding during the annual summer rains but has no obligate riparian species present as a true wetland. The flats included in this also have overland flow and inundation, but soil does not stay saturated as long as lower bottomland sites.

Issues or Problems

Native Uncharacteristic Conditions

Comments

For map zone (MZ) 32, this model was imported without changes from BpS 15041 (Chihuahuan-Sonoran Desert Bottomland and Swale Grassland - Tobosa Grassland) in MZ26. In MZ26, Biophysical Setting (BpS) 1504 was split into a Tobosa Grassland (BpS 2615041) and an Alkali Sacaton (BpS 2615042) system. These types are distinguished by species composition, which is driven by soil salinity. The alkali sacaton system is related to drainages whereas the tobosa grassland is typically found in topographic low areas with clay soils, not necessarily in drainage systems. Only the tobosa grassland component occurs in MZ32.

Site stability controlled by edaphic, topographic position and recurring fire. Model from MZ25 was changed in MZ26 from a 2-box model (the second box having limited shrub cover) to a 1-box model, which includes 10% shrub cover.

Climate changes of more intense rainfalls will cause the soil to become more eroded, which can decrease the grass component of this system. Then the succession may also be changed in terms of grass density and growth. Fire post-recovery could become slower and not as widespread as the model now shows.

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 | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | A | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | A | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | A | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 0-5 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | UN | UN | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | UN | UN | UN | UN | UN | 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 100 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| PLMU3 | Pleuraphis mutica | Tobosagrass | Lower |

Description

Low to zero shrub cover. High-density tobosagrass (*Pleuraphis mutica*) with some other grass species. Low shrub cover of tree cholla (*Opuntia imbricata*), Yucca, and mesquite (*Prosopis* spp.) in stages lacking fire. Replacement fire occurs.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Early1:ALL | 30 |

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 | Early1:ALL | Early1:ALL | 0.1 | 10 | Yes | 0 |

References

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