15042

Chihuahuan-Sonoran Desert Bottomland and Swale Grassland - Alkali Sacaton

BpS Model/Description Version: Aug. 2020

Update: 3/18

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| --- | --- | --- | --- |
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Vegetation Type

Mixed Upland and Wetland

Map Zones

26, 34

Model Splits or Lumps

This Biophysical Setting (BpS) is split into multiple models: 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 is related to drainages whereas the Tobosa grassland is typically found in topographic low areas with clay soils, not necessarily in drainage systems.

Geographic Range

Tularosa Basin, Jornada Basin, south of Interstate 10, northwest of Lordsburg, southeast New Mexico, and extending into southeast Arizona, in localized settings. In Texas this type extends throughout Trans-Pecos, including north of IH-10. Generally associated with flats, swales, bottomlands and cienegas.

Biophysical Site Description

Desert grassland with extensive clay-loam to loamy, sometimes alkaline, bottomland plains and intermittently flooded swales, and cienegas associated with springs (cienegas are minor component of this system). This may also include sub-irrigated alluvial valley sites.

Vegetation Description

Typically dominated by alkali or giant sacaton (*Sporobolis spp*); Alkali sacaton (*Sporobolus airoides*) is often associated with more alkaline and poorly drained areas, and giant sacaton (*Sporobolus wrightii*) with less alkaline and better drained areas. Other codominants are tobosa (*Pleuraphis muticus*) and vine mesquite (Panicum *obtusum*). Within this system, on wetter sites, areas dominated by saltgrass (*Distichlis spicata*) may occur. Even wetter sites adjacent to cienega springs may be dominated by threesquare (*Schoenoplectus americana*) and alkali yellowtops (*Flaveria campestris*). Generally, the shrub cover is less than five percent. Shrub species present may include catclaw mimosa (*M. biuncifera*), *Prosopis glandulosa),* catclaw mimosa (*Mimosa biuncifera*) and lotebush (*Ziziphus obtusifolia*).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| SPAI | *Sporobolus airoides* | Alkali sacaton |
| SPWR2 | *Sporobolus wrightii* | Big sacaton |
| PLMU3 | *Pleuraphis mutica* | Tobosagrass |
| PAOB | *Panicum obtusum* | Vine mesquite |

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

Disturbance Description

Periodically flooded to permanently saturated soils. This type has a high fuel load and is more likely to carry fire than surrounding types. Without fire the stands may become decadent. Bare patches can increase with drought and lack of fire (due to senescent grasses). Drought and lack of fire may enable potential shrub invasion honey mesquite (*Prosopis glandulosa*), catclaw mimosa (*Mimosa biuncifera*) and lotebush (*Ziziphus obtusifolia*).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 14 | 84 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 74 | 16 |  |  |
| All Fires | 12 | 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

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

Adjacency or Identification Concerns

This system may not have obligate riparian species present as a true wetland. The map zone (MZ) 26 modelers are treating the system as including alkali sacaton flats associated with riparian systems, such as along the Pecos River, Rio Grande and short perennial braided marshes.

Issues or Problems

Today, tamarisk infestation is a serious problem in some situations. Reduced groundwater outflow may be detrimental to maintenance of hydrologic regime necessary to maintain the system. Change of precipitation patterns with a decreased amount of precipitation will change this type to more shrubland density with a decrease in herbaceous vegetation. Fire frequency would decrease as well as a having a slower recovery rate

Native Uncharacteristic Conditions

Expansion of mesquite.

Comments

Lynn Loomis (lynn.loomis@tx.usda.gov), a MZ26 modeler, suggests that this may also be a one-box model. The mesquite canopy (current class C) may not have occurred historically without grazing pressure to allow shrub invasion. The one box model would just have fire as a maintenance process occurring at an interval of 5-10yrs.

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 | B | B | C | C | C | C | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | B | B | C | C | C | C | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | C | C | C | C | C | C | UN | UN | UN | UN |
| Shrub | >3.0 | C | C | C | C | C | C | 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 66 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SPAI | Sporobolus airoides | Alkali sacaton | Lower |
| SPWR2 | Sporobolus wrightii | Big sacaton | Lower |

Description

Early seral stage with vigorous growth in grass species. Replacement fire occurs and resets the class.

*Maximum Tree Size Class*  
None

Class B 7 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SPAI | Sporobolus airoides | Alkali sacaton | Lower |
| SPWR2 | Sporobolus wrightii | Big sacaton | Lower |
| PRGL2 | Prosopis glandulosa | Honey mesquite | Middle |

Description

As a mature stand, these grasses will become decadent. Replacement fire occurs, and in the absence of fire, alternate succession occurs.

*Maximum Tree Size Class*  
None

Class C 27 Mid Development 2 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SPAI | Sporobolus airoides | Alkali sacaton | Lower |
| SPWR2 | Sporobolus wrightii | Big sacaton | Lower |
| PRGL2 | Prosopis glandulosa | Honey mesquite | Mid-Upper |
| MIBI | Microseris bigelovii | Coastal silverpuffs | Middle |

Description

Sparse mesquite (*Prosopis glandulosa*) canopy a few meters tall with a dense graminoid cover of sacaton (*Sporobolus spp*). When Prosopis gets to a certain height it escapes fire effects and becomes an almost permanent sparse canopy. Replacement fire occurs infrequently. Also flooding kills the Prosopis overstory which returns the system to a regeneration state. Surface fire in this type maintains the grassland understory but does not remove the Prosopis canopy.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Mid1:OPN | 20 |
| Mid1:OPN | 21 | Mid1:OPN | 999 |
| Mid2:OPN | 30 | Mid2: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** |
| Replacement Fire | Early1:OPN | Early1:OPN | 0.1 | 10 | Yes | 0 |
| Alternative Succession | Mid1:OPN | Mid2:OPN | 1 | 1 | Yes | 30 |
| Replacement Fire | Mid1:OPN | Early1:OPN | 0.05 | 20 | Yes | 0 |
| Replacement Fire | Mid2:OPN | Early1:OPN | 0.002 | 500 | Yes | 0 |
| Wind or Weather or Stress | Mid2:OPN | Early1:OPN | 0.02 | 50 | Yes | 0 |
| Surface Fire | Mid2:OPN | Mid2:OPN | 0.05 | 20 | No | 0 |

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