14952

Western Great Plains Depressional Wetland Systems - Saline

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |
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Vegetation Type

Herbaceous Wetland

Map Zone

34

Model Splits or Lumps

This Biophysical Setting (BpS) is split into multiple models. Western Great Plain Depression Wetland BpS was split into two types: 14951 is a playa whereas 14952 is a saline wetland. A saline soil layer, if available, could be used to distinguish 14952 from the similar-appearing Closed Depressional Wetlands.

Geographic Range

This system found throughout the Llano Estacado in the western part of map zone (MZ) 34 in ECOMAP subsections 315B and possibly 331Bb (Cleland et al. 2007). May occur as a peripheral system in MZ26 and occurs in MZ27.

Biophysical Site Description

This BpS is found on the margin of saline lakes in the western Great Plains. These sites are often subirrigated and associated with springs. Often occur as a complex of multiple lakes associated with a spring. Strongly saline soils cause both the shallow lakes and depressions and the surrounding areas to be more brackish. Salt encrustations can occur on the surface in some examples of this system, and the soils are severely affected and have poor structure.

Vegetation Description

This system typically dominated by alkali sacaton (*Sporobolus airoides*) and saltgrass (*Distichlis spicata*). Within this system, on wetter sites, areas dominated by saltgrass (*Distichlis spicata*) may occur. Foxtail barley (*Hordeum jubatum*) is also present. Threesquare (*Schoenoplectus americana*) can occur in less alkaline situations. Generally, the shrub cover is <5%. Shrub species present may include honey mesquite (*Prosopis glandulosa*) and fourwing saltbush (*Atriplex canescens*). Highly alkaline sites may have sparse herbaceous cover.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| SPAI | *Sporobolus airoides* | Alkali sacaton |
| SPWR2 | *Sporobolus wrightii* | Big sacaton |
| DISP | *Distichlis spicata* | Inland saltgrass |
| ATCA2 | *Atriplex canescens* | Fourwing saltbush |

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

Disturbance Description

Periodically flooded, from localized rain events to permanently saturated soils. Bare patches can increase with drought, lack of fire (due to senescent grasses), and extreme saline conditions. Drought and lack of fire may enable potential shrub invasion of honey mesquite (*Prosopis glandulosa*) and fourwing saltbush (*Atriplex canescens*).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 15 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 15 | 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

Occurrences of this system are somewhat larger than the playas but range from ~1ha to ~250ha.

Adjacency or Identification Concerns

This system will be difficult to distinguish remotely from Western Great Plains Closed Depressional Wetlands. A GIS layer is available for portions of MZ26 and MZ27 (contact Lee Elliott, lelliott@tnc.org). Saline soil layer, if available, could be used to distinguish this system from similar-appearing Closed Depressional Wetlands.

Issues or Problems

Today, tamarisk infestation occurs in some situations. Reduced groundwater outflow may be detrimental to maintenance of tamarisk infestation, which occurs in some situations. Reduced groundwater outflow may be detrimental to the hydrologic regime necessary to maintain the system.

Native Uncharacteristic Conditions

Comments

None

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 | B | B | UN | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | B | B | B | B | UN | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Shrub | >3.0 | B | B | 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 96 Early Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SPAI | Sporobolus airoides | Alkali sacaton | Lower |
| DISP | Distichlis spicata | Inland saltgrass | Lower |

Description

Early seral stage with vigorous growth in grass species.

*Maximum Tree Size Class*  
None

Class B 4 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| SPAI | Sporobolus airoides | Alkali sacaton | Lower |
| DISP | Distichlis spicata | Inland saltgrass | Lower |
| PRGL2 | Prosopis glandulosa | Honey mesquite | Middle |
| ATCA2 | Atriplex canescens | Fourwing saltbush | Middle |

Description

Shrub development can occur with lack of fire. These shrubs are also salt-tolerant and include *Atriplex canescens* and *Prosopis glandulosa*.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:OPN | 0 | Late1:OPN | 45 |
| Late1:OPN | 46 | 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 | Early1:OPN | Early1:OPN | 0.02 | 50 | No | 0 |
| Replacement Fire | Early1:OPN | Early1:OPN | 0.0667 | 15 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:OPN | 0.0667 | 15 | Yes | 0 |

References

Cleland, D.T.; Freeouf, J.A.; Keys, J.E.; Nowacki, G.J.; Carpenter, C.A.; and McNab, W.H. 2007. Ecological Subregions: Sections and Subsections for the conterminous United States. Gen. Tech. Report WO-76D [Map on CD-ROM] (A.M. Sloan, cartographer). Washington, DC: U.S. Department of Agriculture, Forest Service, presentation scale 1:3,500,000; colored

Smith, Loren M. 2003. Playas of the Great Plains. Texas Tech Univ. 2245 pp.

Smith and Haukos. 2002. Floral Diversity in Relation to Playa Wetland Area and Watershed Distrubance. Conservation Bio. 16(4) 1523-1739.