10940

Western Great Plains Sandhill Steppe

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Shrubland

Map Zone

25

Geographic Range

This system is found mostly in southcentral areas of the Western Great Plains Division ranging from the Nebraska Sandhills region south to central Texas, although some examples may reach as far north as the Badlands of South Dakota.

Biophysical Site Description

The climate is semi-arid to arid for much of the region in which this system occurs. This system is found on somewhat excessively to excessively well-drained, deep sandy soils that are often associated with dune systems and ancient floodplains.

Vegetation Description

This system is characterized by a sparse to moderately dense woody layer dominated by *Artemisia filifolia*. Associated species can vary with geography, amount and season of precipitation, disturbance, and soil texture. Several graminoid species such as *Andropogon hallii*, *Panicum virgatum*, *Schizachyrium scoparium*, *Sporobolus cryptandrus*, *Calamovilfa gigantea*, *Calamovilfa longifolia*, *Hesperostipa comata*, and *Bouteloua* spp. can be connected with this system. Other shrub species may also be present, including *Yucca glauca*, *Amorpha canescens*, *Prosopis glandulosa*, *Rhus trilobata*, and *Prunus pumila*. In the southern range of this system, *Quercus havardii* may also be present and represents one succession pathway that develops over time following a disturbance. *Quercus havardii* is able to resprout following a fire and thus may persist for long periods of time once established.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ARFI2 | *Artemisia filifolia* | Sand sagebrush |
| YUGL | *Yucca glauca* | Soapweed yucca |
| BOUTE | *Bouteloua* | Grama |
| ANHA | *Andropogon hallii* | Sand bluestem |
| SCSC | *Schizachyrium scoparium* | Little bluestem |
| CAGI3 | *Calamovilfa gigantea* | Giant sandreed |
| PAVI2 | *Panicum virgatum* | Switchgrass |
| CALO | *Calamovilfa longifolia* | Prairie sandreed |

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

Disturbance Description

Fire is the dominant disturbance. Drought stress can impact this system significantly in some areas. The potential exists for this Biophysical Setting (BpS) to be converted to sand blowout if fire occurs at the wrong growth stage, followed by strong wind and drought.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 16 | 100 |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires | 16 | 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

NatureServe classifies this type as "Large Patch." 100s-10,000s of acres.

Adjacency or Identification Concerns

Issues or Problems

Continuous grazing or uncontrolled grazing can lead to the decrease of the herbaceous component, creating an overabundance of sandsage. Decreasing dominance of some of the grass species such as *Andropogon hallii*, *Sorgastrum nutans*, *Calamovilfa longifolia*, *Calamovilfa gigantea*, *Sporobolus cryptandrus*, and *Schizachyrium scoparium* can lead to erosion and blowouts of exposed soils and sometimes irreversible changes to this site.

Native Uncharacteristic Conditions

Comments

May not occur in map zone 25.

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 | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | B | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Tree | >50 | B | B | B | B | B | 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 8 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ANHA | Andropogon hallii | Sand bluestem | All |
| SPCR | Sporobolus cryptandrus | Sand dropseed | All |
| BOGR | Boerhavia gracillima | Slimstalk spiderling | All |
| ERTR3 | Eragrostis trichodes | Sand lovegrass | All |

Description

Following disturbance, herbs establish from seed and existing subsurface structures. Rate of establishment depends on moisture.

*Maximum Tree Size Class*  
None

Class B 92 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ARFI2 | Artemisia filifolia | Sand sagebrush | Upper |
| YUGL | Yucca glauca | Soapweed yucca | Low-Mid |
| SPCR | Sporobolus cryptandrus | Sand dropseed | Lower |
| AMCA6 | Amorpha canescens | Leadplant | Low-Mid |

Description

Established herbaceous layer. Shrubs, half shrub establish during this time.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 1 |
| Mid1:CLS | 2 | Mid1:CLS | 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:ALL | Early1:ALL | 0.01 | 100 | No | 0 |
| Native Grazing | Mid1:CLS | Early1:ALL | 0.02 | 50 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.067 | 15 | Yes | 0 |

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