13930

Edwards Plateau Limestone Shrubland

BpS Model/Description Version: Aug. 2020

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

Shrubland

Map Zones

26, 34

Geographic Range

Occurs throughout the west central portion of TX specifically on the Edwards Plateau Limestone formation. This particular model relates to the western portion of this system.

Biophysical Site Description

This system occurs as a matrix on relatively thin-soiled surfaces of plateaus of the massive limestones such as the Edwards limestone. These short to tall shrublands are variable in density depending on amount of bedrock. It tends to occur on shallow soils over massive hard-bedded limestone formations and/or in the western and drier portions of the Edwards Plateau of TX.

Vegetation Description

These short to tall shrublands are variable in density depending on amount of bedrock. Sandpaper oak (Quercus vaseyana), Mohr’s oak (Q. mohriana) and shortlobe oak (Q. sinuata var. breviloba) are important components of the system, with some areas dominated by plateau oak (Q. fusiformis). Ashe juniper (Juniperus ashei) is often an important component of this system. Other species may include evergreen sumac (Rhus virens), prairie sumac (R. lanceolata), Texas redbud (Cercis canadensis var. texensis), stretchberry (Forestiera pubescens), Texas ash (Fraxinus texensis), Mexican buckeye (Ungnadia speciosa), mescal bean (Sophora secundiflora), Texas persimmon (Diospyros texana), algerita (Mahonia trifoliolata) and lechuguilla (Agave lechuguilla). This system also includes Q. mohriana-dominated shrublands that are more common in the southern shortgrass prairie northwest of the Edwards Plateau, often sharing dominance with Pinchot’s juniper (J. pinchotii). Oak species will change along the eastern portion of this vegetation unit.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| JUAS | *Juniperus ashei* | Ashe's juniper |
| JUPI | *Juniperus pinchotii* | Pinchot's juniper |
| QUVA5 | *Quercus vaseyana* | Sandpaper oak |
| QUMO | *Quercus mohriana* | Mohr oak |
| QUFU | *Quercus fusiformis* | Plateau oak |
| BOER | *Boerhavia erecta* | Erect spiderling |
| BOCU | *Bouteloua curtipendula* | Sideoats grama |

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

Disturbance Description

Disturbances such as fire may be important processes maintaining this system. Wind driven fire events dominate disturbance following dry periods. Fuel include sparse grass and low-growing shrubs.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 48 | 55 | 20 | 100 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 58 | 45 |  |  |
| All Fires | 26 | 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

Patchy shrubs with interspersed grass creates discontinuous fuel with open rock and barren ground. Disturbance area limited to mesa tops.

Adjacency or Identification Concerns

Early-successional vegetation of Edwards Plateau Limestone Savanna and Woodland (CES303.660) may exhibit a composition and structure similar to the vegetation described and classified here, but the temporal dynamics are different.

Issues or Problems

Lack of knowledge about historical maintenance of shrubland communities. Requires frequent fire to maintain open nature. If there is an increase in juniper and other shrub densities, then moisture to the grass component will decrease because junipers and shrubs will absorb most of the precipitation. This decrease of moisture will decrease grass patches which in turn increase soil erosion and change to less frequent fires. Soil stability will decrease when fires do occur due to less soil holding because there will be less ground level vegetation. This will change the habitat geomorphology to a more barren habitat type.

Native Uncharacteristic Conditions

Comments

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 | A | A | A | A | UN | UN | UN | UN | UN |
| Shrub | 0.5-1.0 | B | B | B | B | B | UN | UN | UN | UN | UN |
| Shrub | 1.0-3.0 | B | B | C | C | C | UN | UN | UN | UN | UN |
| Shrub | >3.0 | B | B | C | C | C | UN | UN | UN | UN | UN |
| Tree | 0-5 | C | C | 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 20 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| RHVI | Rhexia virginica | Handsome harry | Upper |
| QUVA5 | Quercus vaseyana | Sandpaper oak | Upper |
| QUMO | Quercus mohriana | Mohr oak | Upper |
| BOCU | Bouteloua curtipendula | Sideoats grama | Lower |

Description

Dominated by widely scattered shrubs. Over time, vegetation moves to class B as the primary succession pathway. Replacement fire resets this seral state.

*Maximum Tree Size Class*  
None

Class B 34 Mid Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QULA | Quercus laceyi | Lacey oak | Upper |
| QUMO | Quercus mohriana | Mohr oak | Upper |
| JUAS | Juniperus ashei | Ashe's juniper | Upper |
| JUPI | Juniperus pinchotii | Pinchot's juniper | Upper |

Description

Resprouting of dominant shrubs covers grass interspaces. Shrub growth and development limited by shallow soils and limited precipitation. Surface fires occur due to discontinuous fuel and terrain barriers. Surface fires maintain the class. Surface fires may occur. Stand replacement occurs infrequently as major wind-driven events.

*Maximum Tree Size Class*  
None

Class C 46 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| JUAS | Juniperus ashei | Ashe's juniper | All |
| JUPI | Juniperus pinchotii | Pinchot's juniper | All |
| QULA | Quercus laceyi | Lacey oak | All |
| QUMO | Quercus mohriana | Mohr oak | All |

Description

Established shrubs dominate the site, grass cover diminished. Stand replacement fires occur due to lightning ignition of taller shrubs with canopy spread. Junipers may increase in dominance.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:OPN | 10 |
| Mid1:OPN | 11 | Late1:OPN | 30 |
| Late1:OPN | 31 | 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** |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Mid1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Surface Fire | Mid1:OPN | Mid1:OPN | 0.05 | 20 | No | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.0333 | 30 | Yes | 0 |

References

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

Powell, M. 1998. Trees and Shrubs of the Trans-Pecos. University of Texas Press.