

13930

Edwards Plateau Limestone Shrubland

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Joseph White	Joseph_D_White@baylor.edu	Delbert Bassett	dmbassett@neo.tamu.edu
John Morlock	John_Morlock@nps.gov	None	None
Richard Gatewood	richard_gatewood@nps.gov	None	None

Reviewer: Tim Christiansen timothy.a.christiansen2.nfg@yahoo.com

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	<i>Juniperus ashei</i>	Ashe's juniper
JUPI	<i>Juniperus pinchotii</i>	Pinchot's juniper
QUVA5	<i>Quercus vaseyana</i>	Sandpaper oak

QUMO	<i>Quercus mohriana</i>	Mohr oak
QUFU	<i>Quercus fusiformis</i>	Plateau oak
BOER	<i>Boerhavia erecta</i>	Erect spiderling
BOCU	<i>Bouteloua curtipendula</i>	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.