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Western Great Plains Mesquite Woodland and Shrubland

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None	None	None	None

Vegetation Type

Shrubland

Map Zones

26

Geographic Range

Southern high plains Texas, Oklahoma and New Mexico. Presettlement, this Biophysical Setting (BpS) was highly restricted to deep mesic alluvial soils. BpS has expanded greatly in modern day and occurs over much of the Southern Great Plains. More common on the east side of map zone (MZ) 34 (ECOMAP subsections 315C, 332Fb and 315Fb; Cleland et al. 2007) becoming sporadic on the west side (ECOMAP subsections 313Bd and 315B).

Biophysical Site Description

Deep alluvial soils along drainages in relation to short grass or mixed grass prairie types.

Vegetation Description

Honey mesquite (*Prosopis glandulosa*) canopy with a short or mixed grass prairie of little bluestem (*Schizachyrium scoparium*) in the east and side-oats grama (*Bouteloua curtipendula*) in the west. Other species may include lotebush (*Ziziphus obtusifolia*), four-wing saltbush (*Atriplex canescens*), prickly pear (*Opuntia* ssp), blue grama (*Bouteloua gracilis*), sweet acacia (*Acacia farnesiana*), Texas wintergrass (*Nassella leucotricha*), muhly grass (*Muhlenbergii porteri*) and buffalograss (*Buchloe dactyloides*).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PRGL2	<i>Prosopis glandulosa</i>	Honey mesquite
SCHIZ4	<i>Schizachyrium</i>	Little bluestem
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

Frequent fire (7-10yr mean fire return interval [MFRI]) is the dominant disturbance type in this BpS with a Fire Regime of I. The fire frequency is determined by the fire behavior in the adjacent prairie. Grazing by bison is also a disturbance in the BpS which would reduce fuel loading and influence the fire intensity and frequency. The modelers assumed grazing was a natural process when setting the MFRI.

For a scenario where grass is dominant and woodland is sparse, a widespread regional drought would also reduce fuel loads and could increase the density of the open woodland. If hydraulic lift is generated by the mesquite, then the shallow rooted grasses could survive extended drought.

For a scenario where the woodland is dominant, the effects of drought are uncertain. One consideration is that a widespread drought will infrequently drive more of the BpS to the early successional stage. Alternatively, drought could reduce the grass community while increasing the woodland density thus maintaining more of the BpS in the late-open stage.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	14	51		
Moderate (Mixed)				
Low (Surface)	15	49		
All Fires	7	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

Linear or small patch. Rarely large patch.

Adjacency or Identification Concerns

This BpS always occurs associated with short or mixed grass prairie.

Issues or Problems

This BpS is currently much more widespread on the landscape due to the spread of mesquite with grazing disturbance and lack of fire in the Southern Great Plains.

Native Uncharacteristic Conditions

The spread of mesquite in the Southern Great Plains has reduced the grassland class (A) and has increased the shrubland and woodland class (B).

Comments

For MZs 26 and 34 this model was created by Lee Elliott and Douglas Zollner and reviewed by Delbert M. Bassett. The Sclass definitions are slightly different so MZ26 and MZ34 were not combined prior to the BpS review.

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	C	C	C	C	C	B	B	B	B	B

Tree	0-5	C	C	C	C	C	UN	UN	UN	UN	UN
Tree	5-10	C	C	C	C	C	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 23 Early Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCHIZ4	Schizachyrium	Little bluestem	Upper
BOCU	Bouteloua curtipendula	Sideoats grama	Upper

Description

This class is an open mixed or short grass prairie dominated by little bluestem in the eastern range and side-oats grama in the west.

Maximum Tree Size Class

None

Class B 5 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PRGL2	Prosopis glandulosa	Honey mesquite	Upper
SCHIZ4	Schizachyrium	Little bluestem	Lower
BOCU	Bouteloua curtipendula	Sideoats grama	Lower

Description

This class is dominated by dense shrubs, though the canopy itself will remain sparse due to the fine foliage of mesquite.

Maximum Tree Size Class

None

Class C 72 Late Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PRGL2	Prosopis glandulosa	Honey mesquite	Upper

SCHIZ4	Schizachyrium	Little bluestem	Lower
BOCU	Bouteloua curtipendula	Sideoats grama	Lower

Description

This class is an open woodland with a canopy of 3-5m honey mesquite trees. Surface fire will maintain the woodland condition. The grass is sparser in this class than in the surrounding grassland and fire less intense.

The effects of drought are uncertain. One consideration of a widespread drought – it will infrequently cause a transition to the early seral stage. Alternatively, drought could reduce the grass community while increasing the woodland density, thus maintaining class C.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:OPN	0	Mid1:CLS	5
Mid1:CLS	6	Late1:OPN	12
Late1:OPN	13	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
Alternative Succession	Early1:OPN	Mid1:CLS	1	1	Yes	4
Replacement Fire	Early1:OPN	Early1:OPN	0.14	7	Yes	0
Alternative Succession	Mid1:CLS	Late1:OPN	1	1	Yes	5
Replacement Fire	Mid1:CLS	Early1:OPN	0.14	7	Yes	0
Wind or Weather or Stress	Late1:OPN	Early1:OPN	0.01	100	Yes	0
Replacement Fire	Late1:OPN	Early1:OPN	0.05	20	Yes	0
Surface Fire	Late1:OPN	Late1:OPN	0.09	11	No	0

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