

14380

Tamaulipan Savanna Grassland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Herbaceous

Map Zone

36

Model Splits or Lumps

This Biophysical Setting (BpS) is lumped with 1441.

Geographic Range

Current distribution: Southern boundary of sand sheet from Willacy west to Starr, northwest through sand sheet of Zapata, western boundary of sand sheet north and east through Brooks, northern boundary of sand sheet through southern Duval, southern Jim Wells, Kenedy, and southern Kleberg counties, Texas. Pre-European-settlement, it may have occurred on sandy loams throughout much of southern Texas plains.

Biophysical Site Description

This type occurs on the coastal plain of southern Texas, on edge of sand sheet and other areas of sandy or sandy loam soils and less commonly on various other soil types. The best developed representatives occur on moderately deep sands such as occur on the edge of the sand sheet of Kenedy, southern Kleberg, northern Willacy, and Brooks counties, Texas. Mesquite savanna can also be found on other tertiary deposits throughout the gently sloping plain from Del Rio, TX, eastward. The type typically occurs on deeper soils, and the climate is characterized by drought conditions, with aridity increasing from east to west.

Vegetation Description

Some historical accounts suggest that the habitat was an open grassland, with scattered clumps of mesquite and associated shrubs. The scattered clumps within the edge of the sand sheet have mesquite (*Prosopis glandulosa*) forming a nursery for the development of clumps of other shrub species, which may grow in areal extent and coalesce into more continuous shrub cover. Shrub species associated with this type include spiny hackberry (*Celtis pallida*), Brazilian bluewood (*Condalia hookeri*), lime pricklyash (*Zanthoxylum fagara*), lotebush (*Ziziphus obtusifolia*), various acacias, Texas persimmon (*Diospyros texana*), Texas pricklypear (*Opuntia lindheimeri*), devilqueen (*Phaulothamnus spinescens*), and coyotillo (*Karwinskia humboldtiana*). Herbaceous species include little bluestem (*Schizachyrium scoparium*), multiflower false Rhodes grass (*Chloris pluriflora*), silver beardgrass (*Bothriochloa laguroides* ssp. *torreyana*), various crotons (*Croton* spp.), Texas vervain (*Verbena halei*), and rougeplant (*Rivina humilis*).

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PRGL2	<i>Prosopis glandulosa</i>	Honey mesquite
ZAFA	<i>Zanthoxylum fagara</i>	Lime pricklyash
COHO	<i>Condalia hookeri</i>	Brazilian bluewood
CEPA8	<i>Celtis pallida</i>	Spiny hackberry
OPENL	<i>Opuntia engelmannii</i> var. <i>lindheimeri</i>	Texas pricklypear
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem
CHPL2	<i>Chloris pluriflora</i>	Multiflower false rhodes grass
VEHA	<i>Verbena halei</i>	Texas vervain

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

Disturbance Description

The natural range of variation in disturbance within this vegetation is difficult to assess currently because of dramatic changes resulting from severe overgrazing and the resultant changes in vegetation dynamics in the region that occurred in the early to mid-1800s. While most experts agree that this was a major habitat type of the region, the historic extent of mesquite savanna is arguable. Periodic fire, probably resulting from human sources of ignition, likely maintained the habitats as an open savanna. The average fire return interval (FRI) is 6yrs. Periods of overgrazing apparently led to an alternative stable state in which fire does not play a significant role, and the habitat has become a closed shrubland community with little to no opportunity for reverting to mesquite savanna.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	6	95		
Moderate (Mixed)	102	5		
Low (Surface)				
All Fires	5	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

Scale of disturbance is generally a function of increasing aridity toward the west, probably resulting in a generally longer FRI toward the west. Likewise, the landscape of the region to the west is somewhat more dissected by riparian and stringers of mesquite woodlands (known as ramaderos), as compared to the relatively level, topographically less diverse sand sheet where FRI is shorter and scale is larger.

Adjacency or Identification Concerns

Tamaulipan mesquite savanna may occur in conjunction with what is now stable Tamaulipan thornscrub, which lacks recurring fire. Some of this shrubland occurs on thin soil over indurate caliche. These thin soil shrublands (BpS 1392) may have occurred historically and never shared the fire cycle of other shrublands, mesquite woodlands, and savannas. Deeper and tighter soils associated with drainages have a denser mesquite woodland and probably had a somewhat more restricted fire regime. Likewise, riparian woodlands can be found associated with Quaternary alluvium along drainages.

Issues or Problems

The main problem is in the generalization of this type to a large region. Areas that may be mapped as this BpS may also contain tall and short thornscrub that is unlikely to revert to mesquite savanna. Some small proportion of the native grazing effect on the late-open (D) will drive the system toward late-closed (B). Introduction of fire into the existing system is a difficult proposition and will not immediately return the system to the depicted process. Non-native invasive grass species such as guineagrass (*Urochloa maxima*) and buffelgrass (*Pennisetum ciliare*) have created highly flammable conditions, which may be significantly different from historical conditions.

Native Uncharacteristic Conditions

Many sites are currently occupied by denser shrub cover than historical condition.

Comments

This model was created for map zone (MZ) 36. Suggested reviewers for MZ36: Tim Fulbright, Chris Best, Steve Archer, and Lynn Drawe.

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	UN	UN
Shrub	0.5-1.0	B	B	B	B	B	B	B	B	UN	UN
Shrub	1.0-3.0	B	B	B	B	B	B	B	B	UN	UN
Shrub	>3.0	B	B	B	B	B	B	B	B	UN	UN
Tree	0-5	B	C	C	C	UN	UN	UN	UN	UN	UN
Tree	5-10	B	C	C	C	UN	UN	UN	UN	UN	UN
Tree	10-25	C	C	C	C	UN	UN	UN	UN	UN	UN
Tree	25-50	C	C	C	C	UN	UN	UN	UN	UN	UN
Tree	>50	C	C	C	C	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 **87** **Early Development 1 - All Structures**

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	Schizachyrium scoparium	Little bluestem	Upper
CHPL2	Chloris pluriflora	Multiflower false rhodes grass	Upper

BOLAT	Bothriochloa laguroides ssp. torreyana	Silver beardgrass	Upper
CHCU2	Chloris cucullata	Hooded windmill grass	Upper

Description

This class is dominated by grasses such as little bluestem, multiflower false rhodes grass, Arizona cottontop (*Digitaria californica*), silver beardgrass, hooded windmill grass (*Chloris cucullata*), and bristleglass (*Setaria* spp.). Other herbaceous species present are Engelmann's daisy (*Engelmannia peristenia*), awnless bushsunflower (*Simsia calva*), hairy wedelia (*Wedelia texana*), hoary milkpea (*Galactia canescens*), and bladderpod (*Lesquerella* spp.). The class duration is extended due to limited mesquite seed dispersal mechanisms historically (prior to livestock introduction).

Maximum Tree Size Class

None

Class B	3	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PRGL2	Prosopis glandulosa	Honey mesquite	Upper
OPENL	Opuntia engelmannii var. lindheimeri	Texas pricklypear	Middle
ZAFA	Zanthoxylum fagara	Lime pricklyash	Middle
CEPA8	Celtis pallida	Spiny hackberry	Middle

Description

This is early development of dense shrub patches, often surrounding a mesquite tree. A sparse canopy of *Prosopis glandulosa* is emergent above the shrub layer. Shrub patches in this stage of development include honey mesquite (*Prosopis glandulosa*), Texas pricklypear, lime pricklyash, spiny hackberry, Brazilian bluewood, and Texas persimmon. Herbaceous cover is declining due to increased shrub and overstory canopy. Mechanism for drought effect may be an enhanced effect of fire.

Maximum Tree Size Class

None

Class C	10	Late Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
PRGL2	Prosopis glandulosa	Honey mesquite	Upper
ZAFA	Zanthoxylum fagara	Lime pricklyash	Middle
MATR3	Mahonia trifoliolata	Algerita	Middle
LYBE	Lycium berlandieri	Berlandier's wolfberry	Middle

Description

This closed late development stage represents the continued development of shrub patches as they coalesce into more well-developed woodlands of *Prosopis glandulosa* (Archer 1989). In these late stages, other species begin to colonize into woodlands and shrublands. Species present in B are still present in C, but other species begin to colonize such as algerita (*Mahonia trifoliolata*), desert yaupon (*Schaefferia cuneifolia*), and Berlandier's wolfberry (*Lycium berlandieri*).

Maximum Tree Size Class

Medium 9-21" DBH

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:CLS	20
Mid1:CLS	21	Late1:CLS	50
Late1:CLS	51	Late1: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	0.05	20	No	0
Replacement Fire	Early1:ALL	Early1:ALL	0.2	5	Yes	0
Wind or Weather or Stress	Mid1:CLS	Mid1:CLS	0.05	20	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.05	20	Yes	0
Mixed Fire	Mid1:CLS	Mid1:CLS	0.15	7	No	0
Replacement Fire	Late1:CLS	Early1:ALL	0.005	200	Yes	0
Wind or Weather or Stress	Late1:CLS	Late1:CLS	0.05	20	No	0
Mixed Fire	Late1:CLS	Late1:CLS	0.05	20	No	0

References

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

Whittaker, R.H., L.E. Gilbert and J.H. Connell. 1979. Analysis of two-phase pattern in a mesquite grassland, Texas. *Journal of Ecology*. 67: 935-952.