

14860

Texas-Louisiana Saline Coastal Prairie

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Vegetation Type

Herbaceous Wetland

Map Zones

36

Geographic Range

This biophysical setting (BpS) encompasses saline prairie vegetation ranging along the coast of Louisiana and Texas. This coastal prairie region, along with non-saline coastal prairie, once covered as much as 9 million acres (Grace 2000). In general, saline coastal prairies extend a maximum of 25 miles from the coast. In Texas, this type is bordered by the Texas and Louisiana coastal prairie type, with the two types separated based on soil salinity and species composition. It often grades into either Gulf and Atlantic coastal plain tidal marsh or south Texas salt and brackish tidal flat.

This BpS is found in map zone (MZ)36 in ECOMAP subsections 255Da, 255Db and 255Dc (Cleland et al. 2007).

Biophysical Site Description

This BpS is found on Vertisols which developed over Pleistocene terraces flanking the Gulf Coast. It can be characterized by mound-and-intermound microtopography and may encompass both upland and wetland plant communities. This type often comes into contact with river deltas, intergrading into coastal marsh.

Along the Texas coast, a strong moisture gradient occurs from northeast to southwest, affecting species composition, structure and productivity. Salinity gradients combined with varying disturbance regimes create differing species composition and structure throughout the type.

Vegetation Description

Upland dominants include little bluestem (*Schizachyrium scoparium*), gulf cordgrass (*Spartina spartinae*), brownseed paspalum (*Paspalum plicatulum*) and various windmill grasses (*Chloris* spp.). The forb community tends to be less diverse in this type than the Texas Louisiana coastal prairie. Several grass-like species that are important include sedges (*Carex* spp.), spikerush (*Eleocharis* spp.) and bulrush (*Scirpus* spp.). Conspicuous forbs include the genera *Ratibida* (prairie coneflower), *Rudbeckia* (coneflower), sumpweed (*Iva annua*) and *Liatris* (blazing-stars). The most common native shrubs include Eastern baccharis (*Baccharis halimifolia*), marsh elder (*Iva frutescens*) and wax myrtle (*Morella cerifera*) but were not dominants (Grace et al. 2005).

Woody plants did increase under absence of fire, but present day woody invasion likely happens much more rapidly than during pre-settlement conditions.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SPSP	<i>Spartina spartinae</i>	Gulf cordgrass
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem
PAPL3	<i>Paspalum plicatulum</i>	Brownseed paspalum
CHLOR	<i>Chloris</i>	Windmill grass

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

Disturbance Description

Fire (lightning and anthropogenic) occurs about 2-5 times every 10yrs. This type has frequent replacement fires, both lightning and anthropogenic in origin (Stewart 1951, Lehmann 1965, Drawe 1980, Stewart 2002, Journey et al. 2004). One of the dominant herbaceous plants in this type, gulf cordgrass, contains volatile compounds, thus fire ignition was likely possible at any time during the year (McAtee et al. 1979).

A problem with much of the literature on fire in prairies, and therefore a caution, is that it does not include interaction with herbivory (Engle and Bidwell 2001). Bison (*Bison bison*) were historically an important source of disturbance that increased heterogeneity of patches on the landscape. Wild horses were established early on and large herds were noted by early explorers in the southwestern part of this type (Stewart 2002). Pronghorn (*Antilocapra americana*) historically occurred in the southwestern most part of this type (Nelson 1925) where rainfall amounts dropped considerably. Although historical accounts of large groups (1000s) of bison do occur, bison herds were of smaller size and more dispersed in this system than herds of the central Great Plains. Bison grazing affects fire patterns and thus the landscape patterns in tallgrass prairie (Risser 1990) and assuredly this system as well. Bison and other grazing/browsing wildlife species preferentially seek out the new growth of recently burned areas affecting patch composition (e.g., Coppedge and Shaw 1998, Jackson 1965, Risser 1990, Steuter 1986, Fuhlendorf and Engle 2004). Burning causes earlier green-up and increased nutrient content of native grasses and is preferentially selected by grazing animals (Lehmann 1965, Oefinger and Scifres 1977). Typically following green-up, fire is followed by intensive bison grazing pressure to the point that structural classes shifted over the landscape in response to an interaction between grazing pressure and fire (Steuter 1986, Fuhlendorf and Engle 2001, 2004). Following this type of disturbance, the patches are dominated with forbs and likely do not have sufficient fine fuel to carry fire for a year or more. This model depicts a landscape composed of a continuously shifting mosaic of patches over a 2-5yr fire return interval. This mosaic landscape provided habitat for a suite of grassland wildlife species. Frequent fire is essential to control woody dynamics with varying edaphic and moisture conditions (Denevan 1992, Lehmann 1965, Stewart 1951, 2002).

Another disturbance that affected composition and structure in this type is flooding, primarily from tropical storms and hurricanes (10-100yrs). Soil salinity in this type has likely been influenced by saltwater intrusion during storm flooding events.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
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Replacement	4	100	1	6
Moderate (Mixed)				
Low (Surface)				
All Fires	4	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

Burned and unburned patches varied greatly in size from small burns to large, landscape level burns (100,000ac plus). Frequency of fire was also highly variable, ranging from annual fires to 20yr+ fire intervals, creating significant structural variation on the landscape.

Adjacency or Identification Concerns

In Louisiana (MZ37), this system grades coastward into marshes of the chenier plain and inland into Texas Louisiana coastal prairie. In Texas this system generally grades coastward into coastal marsh and tidal flat and inland into Texas-Louisiana coastal prairie. This type can be differentiated from Texas-Louisiana coastal prairie by species dominance, but varying disturbance regimes can change species dominance in both of these types and may make it more difficult to distinguish between the 2 types. Some of the Texas-Louisiana saline coastal prairie type has been lost to rice cultivation and recent woody plant invasion.

Issues or Problems

Some estimates state that 99% of coastal prairie (upland and saline) has been lost through conversion to other uses and environmental degradation due to the interruption of important ecological processes, such as fire/grazing, needed to maintain this system.

Some of the early post-European settlement literature refers to a very frequent fire frequency (bi-annually in some cases), however this was likely restricted to a relatively short period of time following settlement and is not representative of the historic fire regime (Stewart 1951, Lehmann 1965:133, Chamrad and Dodd 1973, Stewart 2002:141-144).

Recent (last 50yrs) woody plant invasion, by both native (*Baccharis* and *Iva*) and exotic species (Chinese tallow) has occurred in this type and has greatly changed the structure of this type as well as disturbance regime.

Native Uncharacteristic Conditions

Overgrazing, fire-exclusion and associated native woody encroachment (*Baccharis* and *Iva*).

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	C	C	C	A	A	A	A	A	A	A
Herb	0.5-1.0	C	C	C	A	A	A	A	B	B	B
Herb	>1.0	C	C	C	A	A	A	A	B	B	B
Shrub	0-0.5	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	>3.0	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Tree	0-5	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Tree	5-10	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Tree	10-25	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Tree	25-50	B	B	UN	UN	UN	UN	UN	UN	UN	UN
Tree	>50	B	B	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 leaf form 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 46 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SPSP	<i>Spartina spartinae</i>	Gulf cordgrass	Upper
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem	Upper
FORBS	<NOT FOUND IN NRCS>	<NOT FOUND IN NRCS>	Mid-Upper
CHLOR	<i>Chloris</i>	Windmill grass	Mid-Upper

Description

Open. Burned in last year. "Sweet" regrowth that may occasionally be grazed (local intensive grazing). Cover of bare ground, forbs and annuals will be higher in this open box. Post fire community that is short duration (often weeks-depending on time of burning) before transitioning into one of the other community stages. Native grazing most often occurred in this class since the regrowth is the ideal food source for nutrition.

Maximum Tree Size Class

None

Class B 51 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCSC	<i>Schizachyrium scoparium</i>	Little bluestem	Upper
SPSP	<i>Spartina spartinae</i>	Gulf cordgrass	Upper
SONU2	<i>Sorghastrum nutans</i>	Indiangrass	Upper

PAPL3	Paspalum plicatulum	Brownseed paspalum	Upper
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Description

Closed. Mix of live and standing dead herbaceous biomass. This class is tallgrass dominated, with forbs declining in abundance as time since disturbance increases. Tillering and overall plant vigor is reduced by mulching effect from accumulation of ungrazed, unburned plant litter as time since disturbance increases as well.

Native grazing will occur less frequently in this class since burned areas would be preferred.

Historically, woody plants would have occurred rarely and after very long fire return intervals and would likely have been more common in the south and west portion of the zone, proximate to oak savannas and Tamaulipan thornscrub. Woody plants would most likely have occurred in areas where fire didn't occur as frequently due to inadequate fuel loading and high fuel moisture.

Composition of micro-depressions in this prairie system would have varied over time based on wet-dry cycles. These depressions often contained both typical upland dominant grasses as well as "wetland vegetation" such as various sedge species.

Maximum Tree Size Class

None

Class C 3 Early Development 1 - Open

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SPSP	Spartina spartinae	Gulf cordgrass	None

Description

This class can be produced by hurricane or tropical storm tidal surges that increase saltwater intrusion into saline prairie. The occurrence of storm surges can create this class by dumping salt water on a prairie and killing back grass species. Vegetation is characterized by low seral stage plant communities. These are rare occurrences but can impact large areas.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:CLS	2
Early1:OPN	1	Mid1:CLS	2
Mid1:CLS	3	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:OPN	0.03	33	Yes	0
Replacement Fire	Early1:ALL	Early1:ALL	0.2	5	Yes	0
Wind or Weather or Stress	Mid1:CLS	Early1:OPN	0.03	33	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.33	3	Yes	0

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