

14370

Central and Upper Texas Coast Dune and Coastal Grassland

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Herbaceous

Map Zone

36

Geographic Range

This Biophysical Setting (BpS) is located along the Gulf Coast and inland varying distances from 0-10mi inland and ranging from Padre Island north to Galveston Bay. To the north, this type is bordered by high salt marshes and freshwater marshes. To the south and west, it also joins with the desert grasslands.

Biophysical Site Description

The three communities that are found in burn units are the sand dunes, barrier flats, and tidal flats communities. The sand dune community is relatively sparsely vegetated. Its close proximity to the Gulf allows for greater impacts of salt spray on the vegetation. Also, the higher dune elevations limit root access to soil moisture. The lee side of the dune complexes has more plant species and greater growth. Common species include sea oats (*Uniola paniculata*), goat-foot morning glory (*Ipomoea* spp.), and partridge pea (*Chamaecrista fasciculata*).

The barrier flats community is the most common, represented on over 50% of the island. This vegetative community is bordered by the Gulf dunes on the east and the bay marsh and tidal flats on the west. This country is flat with small undulating tertiary dunes, interspersed with freshwater and brackish swales and ponds. Common species include saltmeadow cordgrass (*Spartina patens*), gulf dune paspalum (*Paspalum monostachyum*), and seacoast bluestem (*Schizachyrium scoparium* var. *littorale*). Scattered honey mesquite (*Prosopis glandulosa*) and yucca (*Yucca* spp.) are found, as well as dense areas of eastern baccharis (*Baccharis halimifolia*) and Macartney rose (*Rosa bracteata*). These latter two species are the focus of control/eradication management programs.

The tidal flats community interdigitates along the serrated bay shoreline. This community is made up of more salt-tolerant species, as this zone can be regularly inundated during high-tide events. The common species found here include saltgrass (*Distichlis spicata*), seaside tansy (*Borrchia* spp.), and Gulf cordgrass. This cordgrass contains oil and waxes that can cause an increase in fire behavior.

Vegetation Description

This type has many of the same vegetation elements of tallgrass prairie but also has a number of additional species, including some tropical grasses. A wide variety of plant species have been identified in this type. The forb community tends to be richer in the coastal prairie than in true tallgrass prairie. The species composition is dominated by little bluestem (*Schizachyrium scoparium*), sea coast bluestem, several *Panicums*, and *sacahuista*, also known as Gulf cordgrass. Other important species include bushy bluestem (*Andropogon glomeratus*), other bluestems such as split-beard (*A. ternarius*), broomsedge bluestem (*A. virginicus*), silver bluestem (*Bothriochloa saccharoides*), various *Sporobolus*, and several tropical grasses of the genera *Heteropogon*, *Paspalum*, *Trachypogon*, and the previously mentioned *Panicum*. Secondary species vary in importance regionally depending on topography and soil moisture relations and include sideoats grama (*Bouteloua curtipendula*), buffalograss (*Buchloe dactyloides*), and threeawns (*Aristida* spp.). Several grass-like species that are important include sedges (*Carex* spp.), spikerushes (*Eleocharis* spp.), and bulrushes (*Scirpus* spp.). Conspicuous forbs include the genera *Ratibida*, *Rudbeckia*, *Liatris*, and *Sagittaria*.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SCHIZ4	<i>Schizachyrium</i>	Little bluestem
SCLI11	<i>Schizachyrium littorale</i>	Shore little bluestem
PANIC	<i>Panicum</i>	Panicgrass
SPSP	<i>Spartina spartinae</i>	Gulf cordgrass
UNPA	<i>Uniola paniculata</i>	Seaoats
SPPA	<i>Spartina patens</i>	Saltmeadow cordgrass
ANVI2	<i>Andropogon virginicus</i>	Broomsedge bluestem
PAPL3	<i>Paspalum plicatulum</i>	Brownseed paspalum

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

Disturbance Description

This type is characterized by frequent replacement fires, both lightning and anthropogenic in origin (Stewart 1951; Lehmann 1965; Drawe 1980; Stewart 2002; Journey et al. 2004). Likely, this type has one of the most frequent fire regimes in North America. Annual burning was described in references to historic accounts (Stewart 1951; Chamrad and Dodd 1973; Stewart 2002:141-144), and in one instance, reference was made to burning twice (summer and winter) in the same year (Lehmann 1965:133). These references do not indicate that every acre was burned every year, but it is likely that some considerable area was burned every year with most of the type being burned at least biannually and some areas burned twice in a given year. Lehmann (1965) also notes accounts about the patches of unburned vegetation and relative green-up compared to burned areas. Fire was likely possible during most seasons and dependent on the availability of dry fine fuels sufficient to carry a fire. Ovieda y Valdez in 1534 cited the use of fire in the area surrounding Corpus Christi. Spanish settlers had learned from Native Americans about the importance of fire and applied it to clear brush and to stimulate new growth in grasses (Stewart 2002). Fire has long been an important ecological process along the Texas Gulf Coast, whether through lightning or human-caused ignitions. On Matagorda Island, the conditions often exist for lightning fires. Prior to suppression, these fires likely covered 1,000s of acres in the past. Early fire suppression and grazing reduced fire frequency and the ecological role of fire, contributing to vegetation changes on broad scales. In general, the vegetation change was from more abundant grasses and forbs to increased woody species. Development of levees

and the intracoastal waterway changed the influences of these events and required events of greater magnitude (category 5) to achieve the saltwater inundation flood events that historically occurred under tropical storm pressure. Stand-replacing high-tide events occur on intervals of ~20yrs, bringing saltwater inundation.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	3	100	1	3
Moderate (Mixed)				
Low (Surface)				
All Fires	3	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

None

Adjacency or Identification Concerns

This habitat type is adjacent to coastal marshes and may transition to coastal prairies. It is associated with barrier islands that are susceptible to the greatest impacts from hurricanes and wind events. It is distinguished from the South Texas Dunes by referencing the Barrier Island system that exists from Padre Island north to Galveston Bay. Deep sands that are susceptible to high-wind events and hurricanes delineate this habitat type from the more interior coastal marshes and prairies although the grass and herbaceous species identified here are similar to the marsh and prairie systems.

Issues or Problems

Native Uncharacteristic Conditions

Transitional species following disturbance may inhabit the area for the first year following the event. Ragweed (*Ambrosia* spp.) is often common during this transition period.

Comments

Descriptive changes to the description and quantitative changes to the model resulted in a change in modelers for map zone 36.

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	B	B	B	B	C
Herb	0.5-1.0	A	A	A	A	A	B	B	B	B	C
Herb	>1.0	A	A	A	A	A	B	B	B	B	C
Shrub	0-0.5	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	0.5-1.0	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	1.0-3.0	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Shrub	>3.0	C	C	UN	UN	UN	UN	UN	UN	UN	UN

Tree	0-5	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Tree	5-10	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Tree	10-25	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Tree	25-50	C	C	UN	UN	UN	UN	UN	UN	UN	UN
Tree	>50	C	C	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 38 Early Development 1 - All Structures

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCHIZ4	Schizachyrium	Little bluestem	Upper
SCLI11	Schizachyrium littorale	Shore little bluestem	Upper
PANIC	Panicum	Panicgrass	Upper
SPSP	Spartina spartinae	Gulf cordgrass	Upper

Description

Post-fire community that is short duration (often weeks -- depending on time of burning) before transitioning into one of the other community stages. Succession post-inundation with water proceeds in a different manner through a sedge, then a bunchgrass stage. Vegetation in this stage is sparse with fuel loading from 0.5-2 tons/acre. Fire can carry through fuels within 6 months post-burn but will burn with greatly reduced intensity due to lack of old decadent and dead fuels.

Maximum Tree Size Class

None

Class B 38 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SCHIZ4	Schizachyrium	Little bluestem	Upper
SCLI11	Schizachyrium littorale	Shore little bluestem	Upper
PANIC	Panicum	Panicgrass	Upper
SPSP	Spartina spartinae	Gulf cordgrass	Upper

Description

Mixed forb and grass community either somewhat recovered from inundation with water or continuing post-burn development. Can be somewhat forb-dominated. Most diverse stage with fuel loading ranging from 2-6 tons/acre. Fire will carry through fuels more readily as the early successional plants offer dried vegetation for a more viable fuel bed.

The primary distinction between Class B and Class C is that Class B will have higher plant diversity and less dense canopy. Class C may have less plant diversity and will have a denser, more decadent canopy as time since fire increases.

Maximum Tree Size Class

None

Class C 24 Late Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
RATIB	Ratibida	Prairie coneflower	Upper
RUDBE	Rudbeckia	Coneflower	Upper
SCHIZ4	Schizachyrium	Little bluestem	Upper
SCLI1	Schizachyrium littorale	Shore little bluestem	Upper

Description

Forb-dominated site with cordgrass, bluestem, marshhay, and seaots. Diversity of species decreases with maturity of this stand, and tons per acre of fuel loading is found between 4-10 tons/acre. Fire will carry rapidly through fuels as there is an abundance of dried decadent fuels to offer a continuous fuel bed. Fire eliminates these decadent fuels and cycles nutrients.

Maximum Tree Size Class

None

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:CLS	1
Mid1:CLS	2	Late1:CLS	3
Late1:CLS	4	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	Yes	0
Replacement Fire	Early1:ALL	Early1:ALL	0.33	3	Yes	0
Wind or Weather or Stress	Mid1:CLS	Early1:ALL	0.05	20	Yes	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.33	3	Yes	0

Wind or Weather or Stress	Late1:CLS	Early1:ALL	0.05	20	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.33	3	Yes	0

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