

14900

Gulf and Atlantic Coastal Plain Tidal Marsh Systems

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Vegetation Type

Herbaceous Wetland

Map Zones

36

Geographic Range

Southeast Texas from Galveston Bay to Rio Grande Delta, as far inland as tidal influence.

Biophysical Site Description

This biophysical setting (BpS) occurs on the Coastal Plains of Texas. Synonyms of this BpS are coastal marsh and saltmarsh. Elevation ranges are generally from 0-2m above sea level, and are located along bay shorelines, river and tidal deltas. Soils range from sandy along the back-island areas to silts and clays within sheltered lagoons and shorelines. Vegetated marshes are situated in broad bands in the northern portion of map zone (MZ)36, becoming narrow fringe habitats along the south-central portions, then limited to freshwater drainage areas in the Laguna Madre system.

Vegetation Description

Plant zonation is driven by elevation and salinity gradients. Intertidal marshes with salinities averaging 25-35 ppt are composed of predominantly monotypic stands of smooth cordgrass (*Spartina alterniflora*), grading into unvegetated flats with glasswort (*Salicornia* spp.) in the more hypersaline soils around Laguna Madre. Mid-marsh species include marshhay cordgrass (*Spartina patens*) occurring in salinities 10-25 ppt and tolerating irregularly inundation. This zone can be quite expansive around river mouths, but are limited in spatial coverage south of Guadalupe delta. Other intermediate species may predominate in areas of concentrated freshwater inflow, such as seashore paspalum (*Paspalum vaginatum*) and Olney bulrush (*Schoenoplectus americanus*). High marsh zones exhibit the highest species diversity, including grasses such as saltgrass (*Distichlis spicata*), shoregrass (*Monanthochloe littoralis*), and seashore dropseed (*Sporobolus virginicus*) and forbs such as sea ox-eye daisy (*Leucanthemum vulgare*), camphor daisy (*Rayjacksonia phyllocephala*), and sumpweed (*Cyclachaena xanthifolia*). Recently, minor amounts of black mangroves (*Avicennia germinans*) have become established in the mid-marsh zones of higher salinity bays in the mid and lower portions of the zone.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
SPAL	<i>Spartina alterniflora</i>	Smooth cordgrass
SPPA	<i>Spartina patens</i>	Saltmeadow cordgrass
SCAM6	<i>Schoenoplectus americanus</i>	Chairmaker's bulrush

PAVA	<i>Paspalum vaginatum</i>	Seashore paspalum
DISP	<i>Distichlis spicata</i>	Inland saltgrass
BOFR	<i>Borrichia frutescens</i>	Bushy seaside tansy

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

Disturbance Description

The area is subject to infrequent wildfire either from lightning to frequent anthropogenic fire in the mid-marsh areas. Ignition fires may occur from lightning in the intertidal zone, although it probably has low spread due to high fuel moisture. Flooding from tropical storms does not have a major impact on this system, unless high waters are sustained through coastal flooding from high rainfall levels in the watershed.

Herbivory from native ungulates and waterfowl were additional disturbance factors that can set back productivity more than species composition changes. Geese are predominant grazers in the intermediate and brackish zones where tubers of Olney bulrush are prevalent. Repetitive goose eatouts in the same location may result in formation of open water habitat. In areas that burn during drier conditions, saltgrass may colonize the area and ameliorate soil salinity through shading and facilitate regrowth of more competitive species.

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	27	100		
Moderate (Mixed)				
Low (Surface)				
All Fires	27	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

This BpS ranges in relative coverage as being abundant along the northern portions of the mapzone to being restricted to narrow fringes in the south central areas, as related to decreases in rainfall and increase in evapotranspiration from north to south. Historical estimates of coastal marsh in Texas in 1955 totaled 387,000ac; whereas in 1992 about 356,000ac remain.

Adjacency or Identification Concerns

This BpS grades into BpS1437 (Texas Coast Dune and Deep Sand Grassland) or estuarine waters. The western edge is bordered by either BpS 1486 (Texas-Louisiana Saline Coastal Prairie), BpS 1434 (Texas-Louisiana Coastal Prairie) or BpS 1338 (Central Texas Coastal Fringe Forest and Woodland).

Issues or Problems

There is very little historical data about this system prior to 1950. The construction of the Gulf Intracoastal Waterway was initiated in the 1940s, and effectively resulted in conversion of coastal marsh to deepwater habitat, or upland (deposition of dredged material). Additional changes to bay circulation may have caused conversion of coastal marsh to unvegetated flats.

Reductions of fresh flows from upstream reservoir construction has increased bay salinities and reduced nutrient and sediment pulses in the estuarine systems. This impact has not been quantitatively evaluated on coastal marshes.

Description

This grassland class is post disturbance (replacement fire) characterized by open semi-canopy in areas with normal fire frequency. A higher proportion of vegetation will include saltgrass, the primary colonizing grass species after disturbance occurs.

This condition is characterized by lower seral stage plant communities. Heavy herbivory following the fire can increase coverage by saltgrass. Continual herbivory can result in unvegetated flats or open water ponds.

Maximum Tree Size Class

None

Class B 92 Mid Development 1 - Closed

Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
SPAL	<i>Spartina alterniflora</i>	Smooth cordgrass	Upper
SPPA	<i>Spartina patens</i>	Saltmeadow cordgrass	Upper
BOFR	<i>Borrichia frutescens</i>	Bushy seaside tansy	Upper
DISP	<i>Distichlis spicata</i>	Inland saltgrass	Middle

Description

This grassland class is characterized by a semi-closed canopy. Replacement fires are rare and are more likely to occur in the mid-marsh (marshhay cordgrass and chairmaker's bulrush) vegetation zone. This fire regime infrequently impacts either the low marsh (smooth cordgrass) or high marsh (sea ox-eye daisy) vegetation zones.

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	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
Native Grazing	Early1:ALL	Early1:ALL	0.1	10	Yes	0
Optional 1	Mid1:CLS	Early1:ALL	0.01	100	Yes	0
Wind or Weather or Stress	Mid1:CLS	Early1:ALL	0.03	33	Yes	0

Replacement Fire	Mid1:CLS	Early1:ALL	0.04	25	Yes	0
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Optional Disturbances

Optional 1: hurricane flooding

References

Moulton, Daniel W., T.E. Dahl and D.M. Dall. 1997. Texas Coastal Wetlands: Status and Trends, Mid-1950's to Early 1990's. USDI Fish and Wildlife Service. Albuquerque, NM, 32 pp.

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

Smith, E.H. 1996. Coastal marshes. In: Tunnell, J.W., Q.R. Dokken, E.H. Smith, and K. Withers (eds.) Current Status and Historical Trends of the Estuarine Living Resources within the Corpus Christi Bay National Estuary Program Study Area, Volume 1, CCBNEP-06A, Corpus Christi Bay National Estuary Program, Corpus Christi, Texas. 543 pp.