

Ecological site R151XY677TX

Saline Fluid Marsh 42+ PZ

Accessed: 05/18/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 151X–Gulf Coast Marsh

Major land resource area (MLRA)151, Gulf Coast Marsh, is in Louisiana (95 percent), Texas (4 percent), and Mississippi (1 percent). It makes up about 8,495 square miles (22,015 square kilometers). The towns of Gretna, Chalmette, and Marrero, Louisiana, and the city of New Orleans, Louisiana, are in the eastern part of this MLRA. The town of Port Arthur, Texas, is in the western part. Interstate 10 and U.S. Highway 90 cross the area. The New Orleans Naval Air Station is in this MLRA. Fort Jackson, overlooking the mouth of the Mississippi River, and the Jean Lafitte National Historic Park and Preserve are in the MLRA. A number of national wildlife refuges and State parks occur throughout this area. MLRA 151 is a very complex ecosystem with active deltaic development and subsidence with extreme anthropogenic impact by man with construction of flood protection levees and channelization occurring on the eastern portion of the MLRA. The Western portion of the MLRA is more stable in that portions of the landscape is protected naturally by the Chenier's, although there is Anthropogenic affects of the interior due to channelization for navigation.

Classification relationships

Major Land Resource Area (MLRA) and Land Resource Unit (LRU) (USDA-Natural Resources Conservation Service, 2006)

Ecological site concept

This plant community is dominated by smooth cordgrass which is specifically adapted to this site. Average depth of water at high tide ranges from 2 to 12 inches and water salinity varies from 12 to 50 ppt, but may become fresher during periods of high rainfall. Increaser plants are seashore saltgrass, glassworts, maritime saltwort, and saltmarsh bulrush. Widgeongrass may occupy some of the open water adjacent to the tidal flat.

Associated sites

R151XY673TX	INTERMEDIATE Firm MARSH
R151XY676TX	INTERMEDIATE Fluid MARSH

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Avicennia germinans</i>
Herbaceous	(1) <i>Spartina alterniflora</i> (2) <i>Distichlis spicata</i>

Physiographic features

This site occurs adjacent to saline bays and bayous in areas subject to direct tidal inundation. The site is a broad, nearly level, coastal flat.

Table 2. Representative physiographic features

Landforms	(1) Salt marsh (2) Tidal flat (3) Estuary
Flooding duration	Very long (more than 30 days)
Flooding frequency	Very frequent
Ponding duration	Very long (more than 30 days)
Ponding frequency	Frequent
Elevation	0 m
Slope	0%
Ponding depth	3–30 cm
Water table depth	0–15 cm
Aspect	Aspect is not a significant factor

Climatic features

The following climatic data is from the weather station listed below. Site specific weather data should be used for land management decision making. For site specific weather conditions, obtain data from a weather station close to the site.

Winds effect surface water levels on this site. Southerly winds tend to elevate tides and prevent fresh water run off. Northerly winds lower tides in the Gulf and allow water to escape from shallow marshes and bays. Strong cold fronts periodically deplete all surface water until the winds subside and incoming tides return.

Severe tropical storms occur about once every 10 years and lesser strength storms once every five years. The main tropical storm months are August and September but a storm may occur as late as October.

Table 3. Representative climatic features

Frost-free period (average)	348 days
Freeze-free period (average)	304 days
Precipitation total (average)	1,499 mm

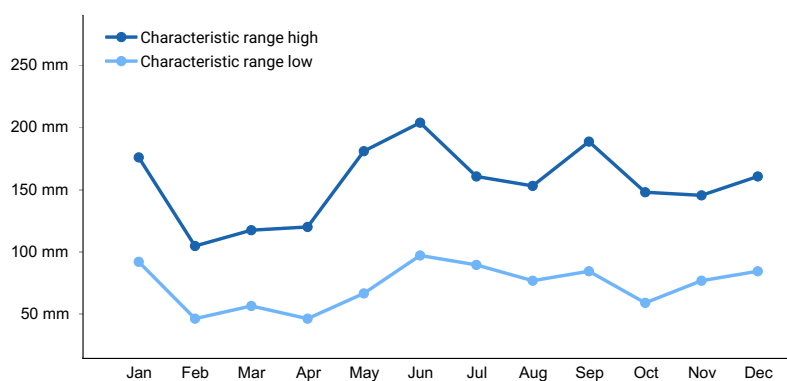


Figure 1. Monthly precipitation range

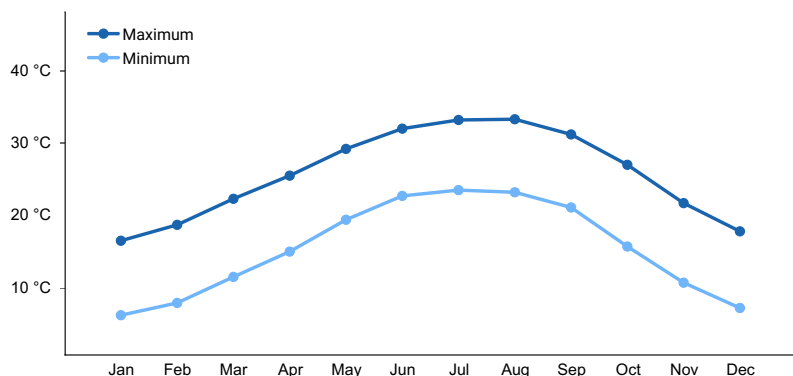


Figure 2. Monthly average minimum and maximum temperature

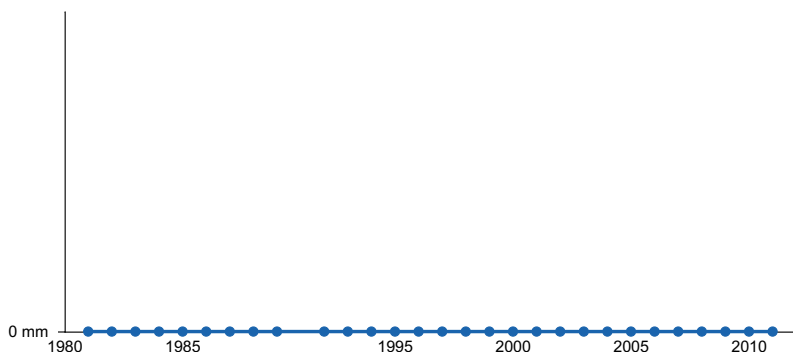


Figure 3. Annual precipitation pattern

Influencing water features

This site is subject to direct tidal inundation. The site is continuously saturated with saline water that varies from 12 to 50 parts per thousand but may become fresher during periods of high rainfall. The average water depth at high tide is two to twelve inches. During low tides, all but one or two inches will drain off.

Soil features

The only soil series in this site is Scatlake. It is a saline, loamy to clayey light gray to dark gray, moderately acid to moderately alkaline soil. It is very deep, very poorly drained, very slowly permeable fluid mineral soil. Surface runoff and internal drainage are lacking. The soil is permanently saturated to the surface. The soil is too soft to support the weight of livestock.

Table 4. Representative soil features

Surface texture	(1) Mucky clay loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Very slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16 cm
Electrical conductivity (0-101.6cm)	8–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	9–18

Soil reaction (1:1 water) (0-101.6cm)	5.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

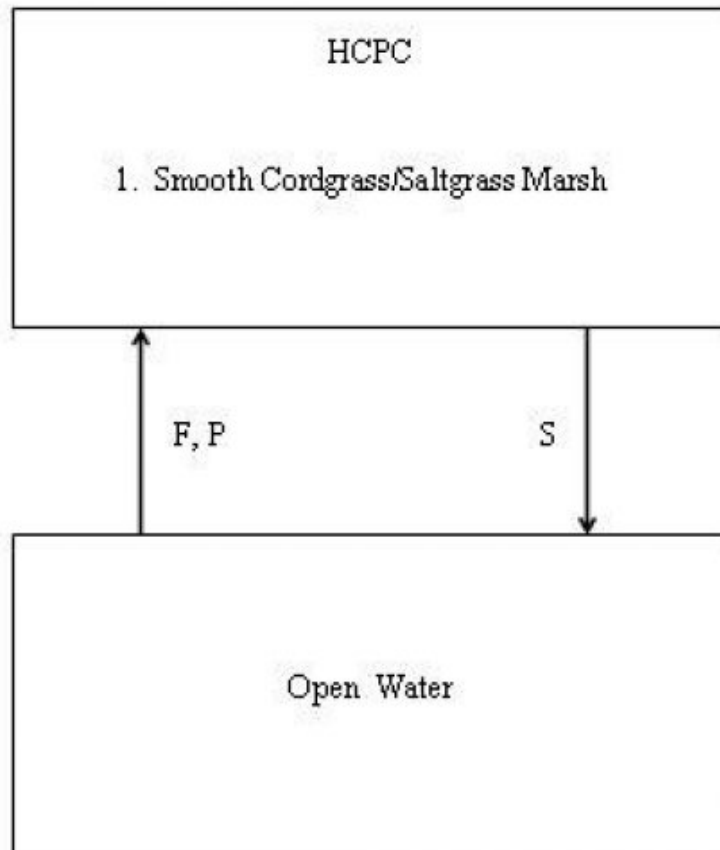
This is a permanently saturated or flooded wetland site that occurs along the immediate upper Texas coastline as a broad, nearly level, coastal flat. The vegetation of the site is entirely influenced by elevation, daily tidal inundation, and salinity levels. Natural shallow drains and ponds are interspersed throughout the site.

Subsidence, a drop in land elevation, may cause a transitional shift from a marsh plant community to a deep open water state. Subsidence may occur naturally or be influenced by human activities such as pumping from wells or the creation of navigation channels. As subsidence progresses, vegetation is submerged and may weaken and die. Loss of anchoring vegetation and subsequent subaqueous erosion of surface sediment and organic detritus through current or wave action moves the site to a deep open water state. Transition back to the fluid saline marsh state will only occur when elevations are restored by filling and the smooth cordgrass community has been re-established by planting and subsidence mechanisms have been removed.

Prescribed fire is not a tool used to maintain this site. Fires occurring when the marsh is dry may remove the organic matter that anchors the herbaceous plant community and allow currents, tides, or wave action to sweep surface sediments and plants away resulting in a deep open water state.

Grazing has no influence on the site as the soils are too soft to support the weight of domestic livestock.

State and transition model



Legend

HCPC – Historic Climax Plant Community

S – Subsidence

F – Fill

P - Plant

Community 1.1

Historic Climax Plant Community



Figure 5. Smooth Cordgrass Plant Community

This historic climax plant community is virtually a monoculture of smooth cordgrass (*Spartina alterniflora*). Other species that occur in small amounts include seashore saltgrass (*Distichlis spicata*), marshhay cordgrass (*Spartina patens*), needlegrass rush (*Juncus roemarianus*), maritime saltwort (*Batis maritima*), Dwarf glasswort (*Salicornia bigelovii*), Virginia glasswort (*Salicornia virginica*), Saltmarsh bulrush (*Schenoplectus robustus*), Perennial saltmarsh aster (*Symphyotrichum tenuifolium*), Bushy sea-oxeye (*Borrchia frutescens*), and Black mangrove (*Avicennia germinans*). A transition away from the smooth cordgrass dominant community to deep open water occurs when subsidence or fire allows waves or tides to remove the organic substrate that anchors the herbaceous plant community in place.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	9583	11180	12778
Forb	504	588	673
Shrub/Vine	—	—	—
Total	10087	11768	13451

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-10%
Grass/grasslike foliar cover	70-90%
Forb foliar cover	0-10%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	10-30%
Bare ground	0%

Table 7. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0-5%
Grass/grasslike basal cover	40-60%
Forb basal cover	0-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	40-60%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	40-60%
Bare ground	0%

Table 8. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	—	—	—
>0.15 <= 0.3	—	—	—	—
>0.3 <= 0.6	—	—	0-10%	0-10%
>0.6 <= 1.4	—	—	70-90%	—
>1.4 <= 4	—	0-1%	—	—
>4 <= 12	—	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

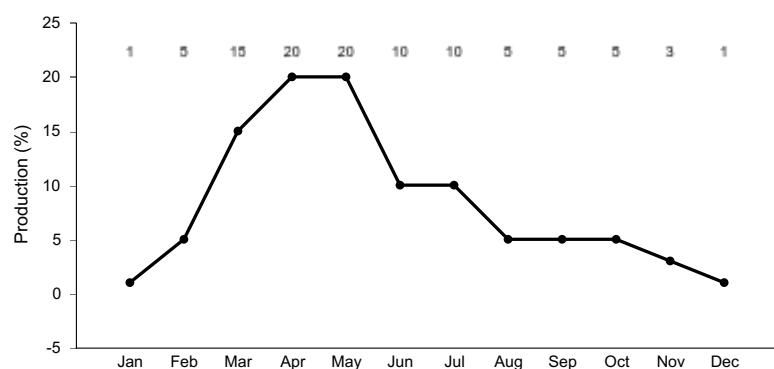


Figure 7. Plant community growth curve (percent production by month).
TX8001, Fluid Saline Marsh. Smooth cordgrass, warm season perennial, 365 day growing season, permanently flooded or saturated site..

State 2 Open Water

Marsh plants exist in a delicate balance with water depth and salinity levels. When this balance is altered, the plant community adapts to the new regime. The Open Water community is where the system is breaking up or where open water ponds exist within the landscape. This phase requires knowledge of the landscape to determine whether it is breaking up. The open water areas within a planning unit are beneficial for wildlife, but require monitoring to insure that they are not enlarging due to erosion of the shorelines which can be a symptom of a marsh unit that is deteriorating.

Community 2.1

Open Water

Transition 1

State 1 to 2

Subsidence

Restoration pathway 1

State 2 to 1

Fill and or Plant site

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				8631–11545	
	smooth cordgrass	SPAL	<i>Spartina alterniflora</i>	8631–11545	–
2				482–639	
	saltgrass	DISP	<i>Distichlis spicata</i>	482–639	–
	saltmeadow cordgrass	SPPA	<i>Spartina patens</i>	482–639	–
3				482–639	
	needlegrass rush	JURO	<i>Juncus roemerianus</i>	482–639	–
Forb					
4				392–1009	
	turtleweed	BAMA5	<i>Batis maritima</i>	392–1009	–
	dwarf saltwort	SABI	<i>Salicornia bigelovii</i>	392–1009	–
	perennial saltmarsh aster	SYTE6	<i>Symphyotrichum tenuifolium</i>	392–1009	–
Shrub/Vine					
5				–	
	black mangrove	AVGE	<i>Avicennia germinans</i>	–	–

Animal community

This site provides habitat for a great variety and quantity of birds, animals, and marine life. Research indicates that up to 16,000 pounds of detritus per acre has been produced on this site. Detritus is the beginning of the entire marine ecosystem. Oysters, crabs, and many species of fish depend on this site to supply nutrients. Post-larval shrimp must have smooth cordgrass as a nursery ground during their life cycle.

Hydrological functions

This site is at or slightly above sea level and is flooded by tides daily. The water table is at or above the ground year round. Surface runoff and internal drainage are lacking. The average depth of water at high tide is 2 to 12 inches. During low tides, all but one or two inches will drain off. Tide flood water associated with tropical storms may be four or more feet deep for short periods.

Recreational uses

Fishing, crabbing, hunting, bird watching.

Wood products

None

Type locality

Location 1: Jefferson County, TX	
UTM zone	N
UTM northing	29.68840
UTM easting	093.84542
Latitude	29° 41' 18"
Longitude	93° 50' 43"
General legal description	Texas Point NWR

Other references

NRCS Soil Survey for Jefferson and Orange Counties.

NRCS NASIS soils database.

USDA Plants database.

Tidal Flat Range Site Description (TX).

Saline Mineral Marsh Range Site Description (LA).

Shallow Stratigraphic Evidence of Subsidence
and Faulting Induced by Hydrocarbon
Production in Coastal Southeast Texas.
Morton, R.A., Purcell, N.A., Peterson, R.L.
USGS Open File Report 01-274.

Aquatic and Wetland Plants of the Western Gulf
Coast. Stutzenbaker, C.D., Texas Parks and
Wildlife Press. 1999.

Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	Mike Stellbauer
Contact for lead author	Mike Stellbauer, Zone RMS, NRCS, Bryan, Texas
Date	09/23/2005
Approved by	

Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

2. **Presence of water flow patterns:** None

3. **Number and height of erosional pedestals or terracettes:** None

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** None

5. **Number of gullies and erosion associated with gullies:** None

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** None noticeable.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface is resistant to erosion. Stability class range is expected to be 5-6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is about 6 inches thick very dark gray organic layer over dark gray fluid mucky clay. SOM is 2-25%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This tallgrass marsh site with adequate cover and little bare ground provides for maximum infiltration and little runoff under normal rainfall events.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: Warm-season tallgrasses/grass-likes >>

Sub-dominant: Cool-season grasses/grass-likes >

Other: Warm-season forbs

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Decadence of warm-season tallgrasses/grass-likes is normal and contributes to the high percentage of organic matter that characterizes this site.
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14. **Average percent litter cover (%) and depth (in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 9000# for below average moisture years to 12000# for above average moisture years.
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** None
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17. **Perennial plant reproductive capability:** All perennial plants should be capable of reproducing
-