USDA Natural Resources Conservation Service

Ecological site R083DY006TX
Fresh Marsh

Last updated: 9/21/2023
Accessed: 05/11/2025

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.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 083D–Lower Rio Grande Plain

Major Land Resource Area (MLRA) 83D makes up about2,500 square miles (6,475 square kilometers). The towns of Brownsville, Edinburg, Harlingen, McAllen, and Raymondville are in this area. U.S. Highways 77 and 281 terminate in Brownsville and McAllen, respectively. The Santa Ana National Wildlife Area is along the Rio Grande in this area.

Classification relationships

USDA-Natural Resources Conservation Service, 2006.
-Major Land Resource Area (MLRA) 83D

Ecological site concept

The site is frequently ponded throughout the year. Vegetative species adapted to wet, inundated conditions are found throughout.

Associated sites

R083DY007TX	**Lakebed**
R083DY024TX	**Tight Sandy Loam**
R083DY025TX	**Clay Loam**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Carex* (2) *Spartina patens*

Physiographic features

These soils are in depressions on the Rio Grande delta plain. Slope ranges from 0 to 1 percent at an elevation of 10 to 50 feet.

Table 2. Representative physiographic features

Landforms	(1) Delta plain > Closed depression
Runoff class	Negligible
Flooding frequency	None
Ponding duration	Long (7 to 30 days)
Ponding frequency	Occasional to frequent
Elevation	10–50 ft
Slope	0–1%
Ponding depth	0–12 in
Water table depth	0–72 in
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83 has a subtropical, subhumid climate. Winters are dry and warm, and the summers are hot and humid. Tropical maritime air masses predominate throughout spring, summer and fall. Modified polar air masses exert considerable influence during winter, creating a continental climate characterized by large variations in temperature. Peak rainfall occurs late in spring and a secondary peak occurs early in fall. Heavy thunderstorm activities increase in April, May, and June. July is hot and dry with little weather variations. Rainfall increases again in late August and September as tropical disturbances increase and become more frequent. Tropical air masses from the Gulf of Mexico dominate during the spring, summer and fall. Prevailing winds are southerly to southeasterly throughout the year except in December when winds are predominately northerly.

Table 3. Representative climatic features

Frost-free period (characteristic range)	365 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	22-26 in
Frost-free period (actual range)	271-365 days
Freeze-free period (actual range)	365 days
Precipitation total (actual range)	21-27 in
Frost-free period (average)	348 days
Freeze-free period (average)	365 days

Precipitation total (average)	24 in

Climate stations used

- (1) HARLINGEN [USC00413943], Harlingen, TX
- (2) MISSION 4 W [USC00415972], Mission, TX
- (3) BROWNSVILLE [USW00012919], Brownsville, TX
- (4) LA JOYA [USC00414911], Mission, TX
- (5) RIO GRANDE CITY [USC00417622], Rio Grande City, TX
- (6) RAYMONDVILLE [USC00417458], Raymondville, TX
- (7) SANTA ROSA 3 WNW [USC00418059], Edcouch, TX
- (8) WESLACO [USC00419588], Weslaco, TX
- (9) MCALLEN [USC00415701], McAllen, TX
- (10) MERCEDES 6 SSE [USC00415836], Mercedes, TX
- (11) MCALLEN MILLER INTL AP [USW00012959], McAllen, TX

Influencing water features

Soils frequently pond for very long periods of time. A permanent water table resides at the surface of the soil, except during extreme periods of drought. Onsite investigation is needed to determine wetland extent and eligibility.

Wetland description

Wetlands are in this site and onsite investigation should be completed to determine extent and eligibility.

Soil features

The soils are very deep, very poorly drained, very slowly permeable soils that formed in loamy alluvium of Quaternary age. Incell is the only correlated soil and is classified as a fine-loamy, mixed, superactive, hyperthermic Cumulic Endoaquolls.

Table 4. Representative soil features

Parent material	(1) Alluvium–sedimentary rock
Surface texture	(1) Clay
Family particle size	(1) Fine-loamy
Drainage class	Very poorly drained
Permeability class	Very slow
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	7 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–10
Soil reaction (1:1 water) (0-40in)	6.1–8.4

Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

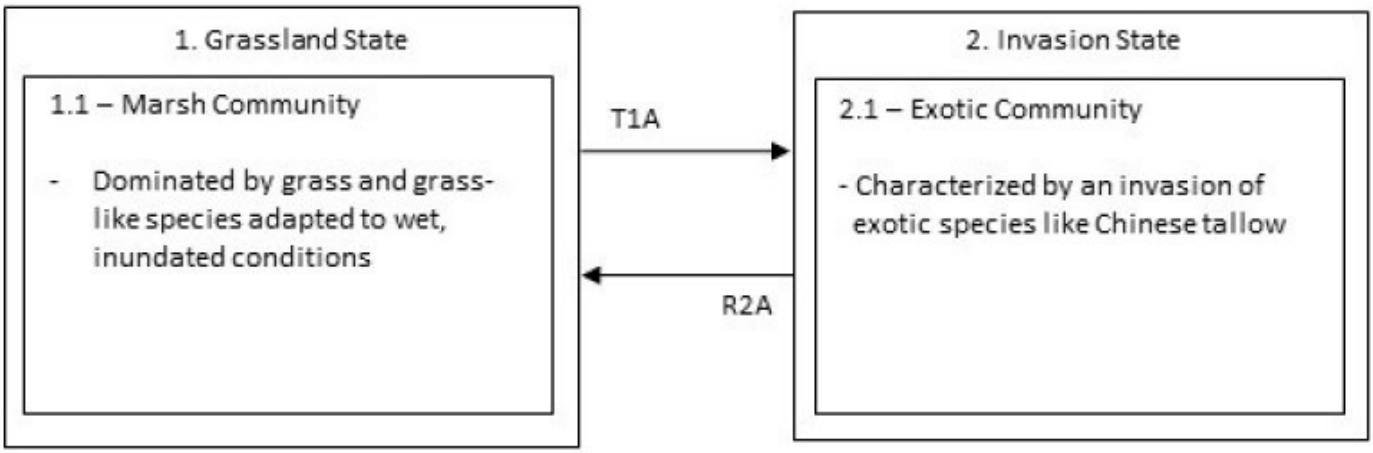
The Lower Rio Grande (MLRA 83D) was a disturbance-maintained system. Prior to European settlement (pre-1825), fire and grazing were the two primary forms of disturbance. Grazing by large herbivores included antelope, deer, and small herds of bison. The infrequent but intense, short-duration grazing by these species suppressed woody species and invigorated herbaceous species. The herbaceous savannah species adapted to fire and grazing disturbances by maintaining belowground tissues. Wright and Bailey (1982) report that there are no reliable records of fire frequency for the Rio Grande Plains because there are no trees to carry fire scars from which to estimate fire frequency. Because savannah grassland is typically of level or rolling topography, a natural fire frequency of three to seven years seems reasonable for this area.

Historical accounts prior to 1800 identify grazing by herds of wild horses, followed by heavy grazing by sheep and cattle as settlement progressed. Grazing on early ranches changed natural graze-rest cycles to continuous grazing and stocking rates exceeded the carrying capacity. These shifts in grazing intensity and the removal of rest from the system reduced plant vigor for the most palatable species, which on this site were midgrasses and palatable forbs. Shortgrasses and less palatable forbs began to dominate the site. This shift resulted in lower fuel loads, which reduced fire frequency and intensity. The reduction in fires resulted in an increase in size and density of woody species.

The open grassland in this area supports mid prairie grasses with scattered woody plants, perennial forbs, and legumes on soils in the uplands. Twoflower and fourflower trichloris, plains bristlegrass, and lovegrass tridens are among the dominant grasses on these soils. Desert yaupon, spiny hackberry, and blackbrush are the major woody plants. In bottomland areas, tallgrasses and midgrasses, such as switchgrass, giant sacaton, fourflower trichloris, big sandbur, little bluestem, and southwestern bristlegrass, are dominant. Hackberry, mesquite, elm, and palm trees are the major woody plants. Forbs are important but minor components of all plant communities.

Most of this area is cropland or improved pasture that is extensively irrigated. Large acreages of rangeland are grazed mainly by beef cattle and wildlife. The major crops are cotton, grain sorghum, citrus, onions, cabbage, and other truck crops. Almost all the crops are grown under irrigation. Hunting leases for white-tailed deer, quail, white-winged dove, and mourning dove are an important source of income in the area. Some of the major wildlife species in this area are white-tailed deer, javelina, coyote, fox, bobcat, raccoon, skunk, opossum, jackrabbit, cottontail, turkey, bobwhite quail, scaled quail, white-winged dove, and mourning dove.

State and transition model



Code	Practice
T1A	Colonization by exotic, invasive species
R2A	Biological, chemical, or mechanical removal of invasive species

State 1
Grassland

Dominant plant species

- sedge (*Carex*), grass
- saltmeadow cordgrass (*Spartina patens*), grass

Community 1.1
Marsh

The Marsh Community is mainly used for livestock grazing and wildlife habitat. Native vegetation includes sedges (Carex spp.), marshhay cordgrass (*Spartina patens*), big cordgrass (*Spartina cynosuroides*), cattail (Typha spp.), and Hartweg's paspalum (*Paspalum hartwegianum*). Other plants found on site are adapted to ponded water conditions throughout most of the year.

State 2
Invasion

Dominant plant species

- Chinese tallow (*Triadica*), shrub

Community 2.1
Exotic

Chinese tallow is one possible invading species in the Fresh Marsh. Chinese tallow establishes by dispersal of animals and can also come from nearby waterways. Once settled, the seeds produce saplings viable to reproduce seeds in as little as three years. The rapid establishment immediately blocks sunlight to understory species and reduces diversity. Unabated growth quickly allows the saplings to grow into the overstory, thus changing the ecological state entirely. Reductions in size and number of all vegetative species are throughout.

Transition T1A
State 1 to 2

A number of exotic plants have invaded the region and marsh systems are especially susceptible. Chinese tallow is an example of an invasive species that can colonize wet and dry areas. Marshes are especially problematic during

droughty conditions when germination can occur more rapidly.

Restoration pathway R2A
State 2 to 1

The driver for restoration is control of invasives. Although an option, mechanical removal of the trees is difficult because they readily regrow from roots and seeds. Several chemicals methods are available including glyphosate for cut-stump treatments, triclopyr for cut-stump and foliar treatments, imazamox for broad spectrum application, and imazapyr as a foliar spray. Many aquatic herbicides have water use restrictions and can potentially kill hardwoods, so labels and restrictions should be read carefully prior to application.

Additional community tables

Inventory data references

Information presented was derived from the revised Range Site, literature, limited NRCS clipping data (417s), field observations, and personal contacts with range-trained personnel.

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Approval

Bryan Christensen, 9/21/2023

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)	
Contact for lead author	
Date	05/11/2025
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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

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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:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**

17. **Perennial plant reproductive capability:**