USDA Natural Resources Conservation Service

Ecological site R083EY008TX
Salty Prairie

Last updated: 9/21/2023
Accessed: 05/13/2025

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.

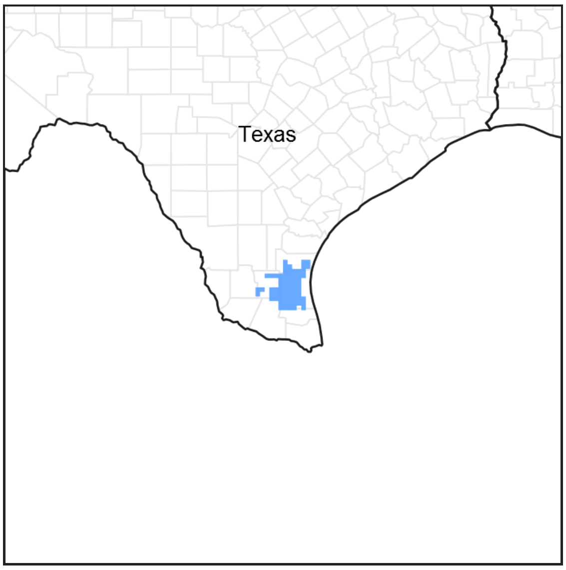

Figure 1. Mapped extent

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): 083E–Sandsheet Prairie

Major Land Resource Area (MLRA) 83E makes up about 4,300 square miles (11,150 square kilometers). The towns of Falfurrias, Premont, and Sarita are in this area. U.S. Highways 77 and 281 run through the area in a north-south direction.

Classification relationships

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

Ecological site concept

The sites are sandy, salty, and ponded. This creates a vegetative community adapted to nutrient poor, saline, and wet conditions.

Associated sites

R083EY007TX	**Lakebed**
R083EY014TX	**Sandy Flat**
R083EY020TX	**Sand Hills**
R083EY021TX	**Sandy**
R083EY022TX	**Loamy Sand**
R083EY023TX	**Sandy Loam**

Similar sites

R083AY008TX	**Salty Prairie**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Distichlis spicata* (2) *Sporobolus airoides*

Physiographic features

These nearly level to gently sloping sites are found on sand sheet of the South Texas sand plain. Ponding occurs inches after heavy rainfall events for brief to long periods. Some sites have a seasonal high water table.

Table 2. Representative physiographic features

Landforms	(1) Sand plain > Sand sheet
Runoff class	Negligible to low
Flooding frequency	None
Ponding duration	Long (7 to 30 days)
Ponding frequency	None to frequent
Elevation	3–91 m
Slope	0–2%
Ponding depth	0–15 cm
Water table depth	0–203 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83 has a subtropical subhumid climate. Winters are dry and fairly 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)	235-365 days
Freeze-free period (characteristic range)	365 days

Precipitation total (characteristic range)	610-737 mm
Frost-free period (actual range)	222-365 days
Freeze-free period (actual range)	365 days
Precipitation total (actual range)	559-762 mm
Frost-free period (average)	288 days
Freeze-free period (average)	365 days
Precipitation total (average)	660 mm

Climate stations used

- (1) KINGSVILLE NAAS [USW00012928], Kingsville, TX
- (2) HEBBRONVILLE [USC00414058], Hebbronville, TX
- (3) FALFURRIAS [USC00413063], Encino, TX
- (4) MCCOOK [USC00415721], Edinburg, TX
- (5) RAYMONDVILLE [USC00417458], Raymondville, TX
- (6) SARITA 7 E [USC00418081], Sarita, TX

Influencing water features

Following rainfall events this site may pond water for varying lengths of time. Saturation can occur in the upper part of the soil and can have reduced conditions during the wet months of the year. Water is received from runoff and seepage from adjacent sites. Each site will need to be visited individually to determine wetland criteria.

Wetland description

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Soil features

Soils are moderately deep to very deep, well drained to very poorly drained with moderate to very slow permeability. Soils have high concentrations of salts that are visible within 40 inches of the surface. Soil series correlated to this site include: Quiteria, Ramita, and Topo.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–sedimentary rock (2) Alluvium–sedimentary rock
Surface texture	(1) Fine sand (2) Loamy fine sand (3) Fine sandy loam
Family particle size	(1) Fine-loamy (2) Coarse-loamy
Drainage class	Very poorly drained to moderately well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–10.16 cm

Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	10–60
Soil reaction (1:1 water) (0-101.6cm)	5.6–9
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The first crude maps labeled this area of South Texas as Nuevo Santader (1746) and later as the Wild Horse Desert (1850). Now ecologists more commonly refer to it as the Tamaulipan Biotic Province or the Mesquite Acacia Woodland. The Lakebed ecological site can be found throughout the Sandsheet Prairie and Gulf Coast Saline Prairie in closed depressions that pond water after rainfall events. This ecological site is in lower landscape positions which receive surface water runoff and water from throughflow. Throughflow is the horizontal flow of water within the soil layer. There is normally very little surface water in this area, so sites can be very important sources of temporary water and are highly attractive to both wildlife and livestock.

Climate is an important, sometimes downplayed, force that affects the plant communities by impacting general plant composition and diversity at a regional scale. Over the past 130 years three climatic regimes have exhibited distinct weather patterns over the American South West that can be related to the establishment of different kinds of plants (e.g. C4 grasses versus C3 shrubs). Perennial warm season grasses and plants (usually C4) benefit most when spring and summer rainfall is consistent. On the opposite spectrum, mesquite, shrubs, and cool season annuals (usually C3) can take advantage of winter rains and can also conserve energy during hot dry summers.

Droughts are a common occurrence in South Texas and were often documented in letters and historical text. For example, Captain John S. “Rip” Ford mentioned the 1864 drought in his memoirs. He reported thousands of domestic animals dead around South Texas water holes and that the Nueces River was dry for miles. Maria Von Blucher commented in 1872 that, “as a result of the tremendous drought…half of all the cattle in Texas died…at every prominence where one can overlook the Nueces River, one might count more than 3,000 dead cattle.”

Despite the dry climate, this area of Texas was a mid/shortgrass prairie, which was attractive to ranchers and early settlers. In the mid-1800’s the number of grazing animals affecting the ecosystem began to rise dramatically. In general, numbers of wild horses and cattle increased from the 1840’s through the end of the Civil War. Sheep numbers expanded to outnumber both cattle and horses between 1867 and 1900, and peaked at numbers exceeding 2 million. Since that time sheep numbers have fallen dramatically and cattle have become the principal commercial livestock. The January 2013 Texas Livestock Inventory provided by the National Agricultural Statistics Service shows that less than 500,000 head of livestock including cattle, sheep, and goats are currently being raised south of the Nueces River.

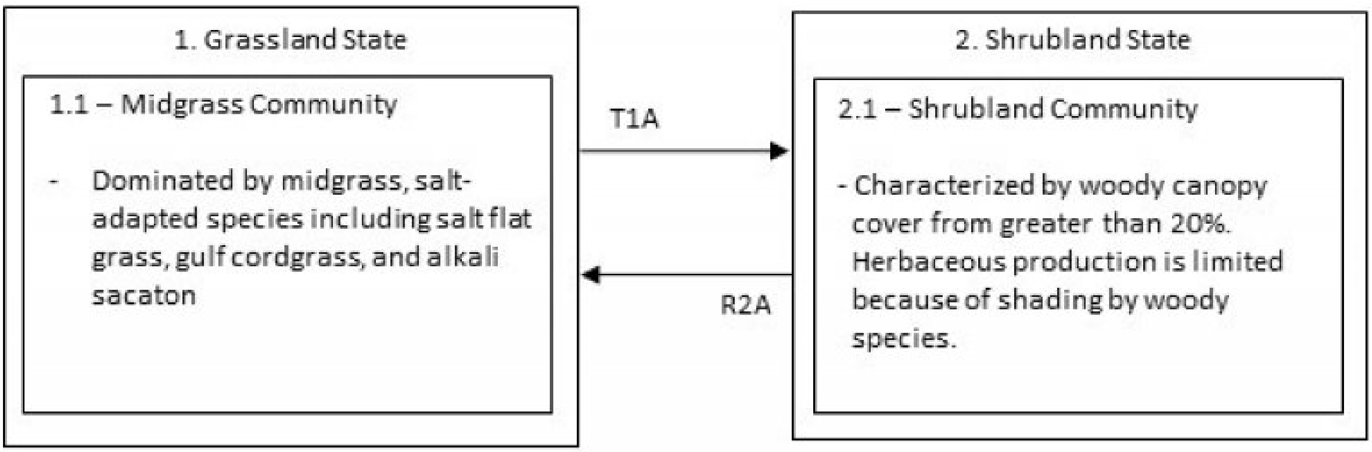
Starting in the mid-1800’s the region saw wide anthropogenic changes in several environmental disturbance regimes. Research done to investigate the transition from grassland plant communities to shrubland communities in South Texas indicates that a significant successional change across the region began 100 to 200 years ago, and that stable carbon isotope ratios indicate C3 woody plants currently occupy sites once dominated by C4 grasses. When climate and/or other disturbance regimes change to favor the establishment and spread of woody plants a transition from grassland to shrubland will occur. As grazing use increases past sustainable levels mulch, litter, and other types of ground cover start to decrease, including standing herbaceous material. The plant community structure would also change slowly from a mid/shortgrass prairie to a short grass prairie with an increase in bare ground, annual forbs, and perennial woody species. This would have had a significant impact on water runoff and infiltration rates as well as soil temperatures and historic fire regimes.

A grassland community has the intrinsic ability to compete with woody species for available water and nutrients in the soil when they are growing in the same space at the same time. Their fibrous and expansive root systems are better adapted to use the top 12 to 16 inches of the soil and there appears to be a critical one to two year period during which mesquite seedlings might be in acute competition with grasses for soil resources. As herbaceous cover decreases bare ground increases, providing more opportunity for woody species to germinate and establish. The amount of herbaceous ground cover can also have a large impact on soil surface temperatures. The higher temperature extremes of bare soil may prevent seed germination of both grasses and shrubs creating a negative feedback loop which is only broken when some type of ground cover is established.

Climate and unsustainable grazing pressure have played large roles in the conversion of South Texas grasslands to what is now called “brush country”, but another important factor is a change in the historic fire regime. The range of woody species has not significantly changed in the past 300 to 500 years, but the stature and density of shrub species has greatly increased. The historic fire regime of South Texas was highly variable with fires every five to thirty years. The variability of fires across the region would have been driven by several factors including fine fuel load but, at a local level, fires would have been frequent enough to prevent woody plant seedlings from maturing and dominating a particular area. Grasses are much better adapted to survive periodic fires and have faster regrowth rates than most shrub species but, once established; brush species in South Texas have shown the tendency to survive fires because of their re-sprouting characteristics.

Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The reference plant community is not necessarily the management goal; other vegetative states may be desired plant communities if the Range Health assessments are in the moderate and above category. The biological processes on this ecological site are complex. Therefore, representative values are presented in a land management context. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this ecological site. They are not intended to cover every situation or the full range of conditions, species, and responses for the ecological site.

State and transition model



Code	Practice
T1A	Heavy grazing, No fire, Drought
R2A	Prescribed grazing, Prescribed Fire, Brush management

State 1
Grassland State

Community 1.1
Midgrass

Vegetation consist of plants adapted to the salty conditions of the soil. Common species include salt flat grass (*Distichlis spicata*), gulf cordgrass (*Spartina spartinae*), alkali sacaton (*Sporobolus airoides*), and whorled dropseed

(*Sporobolus pyramidatus*). Fire and grazing are natural parts of the community. Without proper management, woody species will encroach.

State 2
Shrubland

Community 2.1
Shrubland

Heavy grazing, lack of fire, and drought will cause woody species to increase. Mesquite (Prosopis spp.), sea-oxeye daisy (*Borrichia frutescens*), cactus (Opuntia spp.), and many other wood species will increase in size and density. Continued growth will shade the herbaceous vegetation and change the community dynamics.

Transition T1A
State 1 to 2

Heavy continuous grazing and drought will transition this site into a Shrubland State (2). The site is characterized by greater than 20 percent woody canopy cover.

Restoration pathway R2A
State 2 to 1

Prescribed grazing, prescribed fire, and brush management are required to restore the community back to a Grassland State (1). Removal of woody species below 20 percent allows more light and nutrients to herbaceous species. Reducing grazing pressure will allow plants to regain vigor and re-establish.

Additional community tables

Animal community

This ecological site is an important component of the wildlife habitat because of the water-receiving position it occupies on the Sandsheet Prairie and Gulf Coast Saline Prairie. They can often be the only sources of standing water, which attracts all types of wildlife in their vicinity. Cattle (Bos spp.) and many species of wildlife make extensive use of this ecological site. White-tailed deer may be found scattered across the prairie, and are found in heavier concentrations where woody cover exists. Feral hogs (Sus scrofa) are present and, at times, become abundant. Coyotes (Canis latrans) are abundant, and probably have replaced the red wolf (Canis rufus) in this mammalian predator niche. Rodent populations rise during drier periods and fall during periods of inundation. Geese (family Anatidae) and sandhill cranes (Grus canadensis) abound during winter. Many species of avian predators including northern harriers (Circus cyaneus), red-tailed hawks (Buteo jamaicensis), kestrels (Falco sparverius), white-tailed kites (Elanus leucurus), and, occasionally, swallow-tailed kites (Elanoides forficatus). Many species of grassland birds use the ecological site, including blue grosbeaks (Guiraca caerulea), dickcissels (Spiza americana), eastern meadowlarks (Sturnella magna), and several sparrows, including Cassin's sparrow (Aimophila cassinii), vesper sparrow (Pooecetes gramineus), lark sparrow (Chondestes grammacus), savannah sparrow (Passerculus sandwichensis), grasshopper sparrow (Ammodramus savannarum), and Le Conte's sparrow (Ammodramus leconteii).

Inventory data references

The data contained in this document is derived from analysis of inventories, clipping studies, and ecological interpretation from field evaluations.

Other references

Archer, S. 1995. Tree-grass dynamics in a Prosopis-thornscrub savanna parkland: reconstructing the past and predicting the future. Ecoscience, 2:83-99.

Archer, S. 1990. Development and stability of grass/woody mosaics in a subtropical savanna parkland, Texas, USA. Journal of Biogeography 17: 453-462.

Archer, S., C. Scifres, C. R. Bassham, and R. Maggio. 1988. Autogenic succession in a subtropical savanna: conversion of grassland to thorn woodland. Ecological Monographs 58(2):110-127.

Baen, J. S. 1997. The growing importance and value implications of recreational hunting leases to agricultural land investors. Journal of Real Estate Research, 14:399-414.

Beasom, S. L, G. Proudfoot, and J. Mays. 1994. Characteristics of a live oak-dominated area on the eastern South Texas Sand Plain. In the Caesar Kleberg Wildlife Research Institute Annual Report, 1-2.

Berlandier, J. L. 1980. Journey to Mexico during the years 1826 to 1834: translated. Texas State Historical Associated and the University of Texas. Austin, TX.

Bond, W. J. What Limits Trees in C4 Grasslands and Savannas? Annual Review of Ecology, Evolution, and Systematics. 39:641-659.

Diamond, D. D. and T. E. Fulbright. 1990. Contemporary plant communities of upland grasslands of the Coastal Sand Plain, Texas. Southwestern Naturalist, 35:385-392.

Ford, J. S. 2010. Rip Ford's Texas. University of Texas Press. Austin, TX.

Fulbright, T. E. and F. C. Bryant. 2003. The Wild Horse Desert: climate and ecology. The Ranch Management, 35-58.

Fulbright, T. E., D. D. Diamond, J. Rappole, and J. Norwine. 1990. The Coastal Sand Plain of Southern Texas. Rangelands, 12:337-340.

Hanselka, C. W., D. L. Drawe, and D. C. Ruthven, III. 2004. Management of South Texas Shrublands with prescribed fire. In Proceedings: Shrubland dynamics -- fire and water, 57-61.

Inglis, J. M. 1964. A history of vegetation of the Rio Grande Plains. Texas Parks and Wildlife Department Bulletin No. 45, Austin, TX.

Johnson, M. C. 1963. Past and present grasslands of southern Texas and northeastern Mexico. Ecology 44(3):456-466.

Jurena, P.N., and S. Archer. 2003. Woody Plant Establishment and Spatial Heterogeneity in Grasslands Ecology, 84(4):907-919.

Lehman, V. W. 1969. Forgotten legions: sheep in the Rio Grande Plains of Texas. Texas Western Press, University of Texas at El Paso, El Paso, TX.

McLendon T. 1991. Preliminary description of the vegetation of South Texas exclusive of coastal saline zones. Texas Journal of Science, 43: 13-32

Neilson, R. P. 1987. Biotic regionalization and climatic controls in western North America. Vegetatio, 70(3): 135-147.

Norwine, J. and R. Bingham. 1986. Frequency and severity of droughts in South Texas: 1900-1983, 1-17. In Livestock and wildlife management during drought. Edited by R. D. Brown. Caesar Kleberg Wildlife Research Institute, Kingsville, TX.

Palmer, G. R., T. E. Fulbright, and G. McBryde. 1995. Inland sand dune reclamation on the Coastal Sand Plain of Southern Texas. in the Caesar Kleberg Wildlife Research Institute Annual Report, 30-31.

Rappole, J. H. and G. W. Blacklock. 1994. A field guide: Birds of Texas. Texas A&M University Press, College Station, TX.

Rhyne, M. Z. 1998. Optimization of wildlife and recreation earnings for private landowners. M. S. Thesis, Texas A&M University-Kingsville, Kingsville, TX.

Woodin, M. C., M. K. Skoruppa, and G. C. Hickman. 2000. Surveys of night birds along the Rio Grande in Webb County, Texas. In Final Report, U.S. Fish and Wildlife Service, Corpus Christi, Texas.

Contributors

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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	05/13/2025
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

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

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

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

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

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

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

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

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

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:**