Ecological site R083AY008TX
Salty Prairie

Last updated: 9/19/2023
Accessed: 05/17/2024

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.

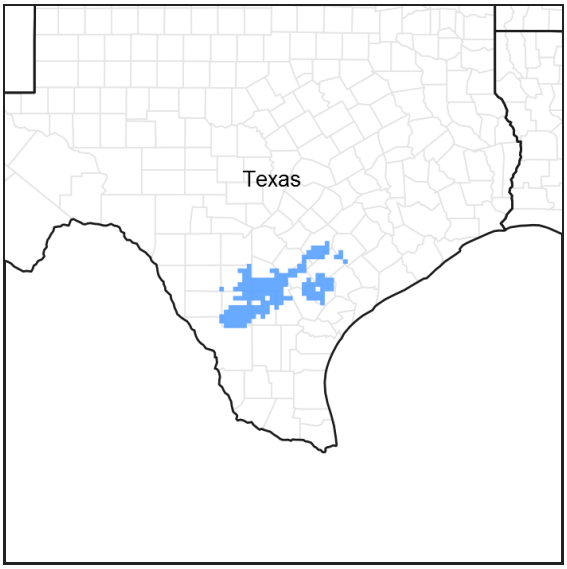


Figure 1. Mapped extent

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): 083A–Northern Rio Grande Plain

This area is entirely in Texas and south of San Antonio. It makes up about 11,115 square miles (28,805 square kilometers). The towns of Uvalde, Cotulla, and Hondo are in the western part of the area, and Beeville, Goliad, and Kenedy are in the eastern part. The town of Alice is just outside the southern edge of the area. Interstate Highways 35 and 37 cross this area. This area is comprised of inland, dissected coastal plains.

Classification relationships

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

Ecological site concept

The sites are sandy, salty, and occasionally flood. The creates a vegetative community adapted to nutrient-poor, saline, and wet conditions.

Associated sites

R083AY005TX	**Shallow**
R083AY024TX	**Tight Sandy Loam**
R083AY027TX	**Western Clay Loam**

Similar sites

R083EY008TX	**Salty Prairie**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Prosopis glandulosa*
Herbaceous	(1) *Distichlis spicata* (2) *Spartina spartinae*

Physiographic features

These soils are on nearly level to very gently sloping low stream terraces. Slopes range from 0 to 2 percent. Some sites occasionally flood. This area is comprised of inland, dissected coastal plains.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Stream terrace
Runoff class	High to very high
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional
Elevation	61–213 m
Slope	0–2%
Water table depth	61–203 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83A is subtropical, subhumid on the western boundary and subtropical humid on the eastern boundary. Winters are dry and mild 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. Average precipitation for MLRA 83A is 20 inches on the western boundary and 35 inches on the eastern boundary. Peak rainfall, because of rain showers, 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)	223-251 days
Freeze-free period (characteristic range)	263-365 days
Precipitation total (characteristic range)	635-813 mm
Frost-free period (actual range)	208-263 days
Freeze-free period (actual range)	254-365 days

Precipitation total (actual range)	610-940 mm
Frost-free period (average)	235 days
Freeze-free period (average)	314 days
Precipitation total (average)	737 mm

Climate stations used

- (1) CROSS [USC00412125], Tilden, TX
- (2) FOWLERTON [USC00413299], Fowlerton, TX
- (3) HONDO [USC00414254], Hondo, TX
- (4) PEARSALL [USC00416879], Pearsall, TX
- (5) POTEET [USC00417215], Poteet, TX
- (6) CHARLOTTE 5 NNW [USC00411663], Charlotte, TX
- (7) CHEAPSIDE [USC00411671], Gonzales, TX
- (8) DILLEY [USC00412458], Dilley, TX
- (9) FLORESVILLE [USC00413201], Floresville, TX
- (10) KARNES CITY 2N [USC00414696], Karnes City, TX
- (11) LYTLE 3W [USC00415454], Natalia, TX
- (12) PLEASANTON [USC00417111], Pleasanton, TX
- (13) HONDO MUNI AP [USW00012962], Hondo, TX
- (14) BEEVILLE 5 NE [USC00410639], Beeville, TX
- (15) CARRIZO SPRINGS 3W [USC00411486], Carrizo Springs, TX
- (16) CUERO [USC00412173], Cuero, TX
- (17) GOLIAD [USC00413618], Goliad, TX
- (18) MATHIS 4 SSW [USC00415661], Mathis, TX
- (19) NIXON [USC00416368], Stockdale, TX
- (20) TILDEN 4 SSE [USC00419031], Tilden, TX
- (21) UVALDE 3 SW [USC00419268], Uvalde, TX
- (22) CALLIHAM [USC00411337], Calliham, TX

Influencing water features

Some sites occasionally flood one to more times per year.

Wetland description

N/A

Soil features

The soils are very deep, somewhat poorly to moderately well drained, very slowly permeable that formed in saline, stratified, sandy and loamy alluvium. A saline horizon is present 3 to 12 inches below the surface. Soil series correlated to this site include: Cost and Imogene.

Table 4. Representative soil features

Parent material	(1) Alluvium–sedimentary rock
Surface texture	(1) Loamy fine sand (2) Fine sandy loam (3) Very fine sandy loam
Family particle size	(1) Fine-loamy
Drainage class	Somewhat poorly drained to well drained
Permeability class	Very slow to slow
Soil depth	203 cm

Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	5.08–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–20%
Electrical conductivity (0-101.6cm)	2–16 mmhos/cm
Sodium adsorption ratio (38.1-101.6cm)	13–60
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

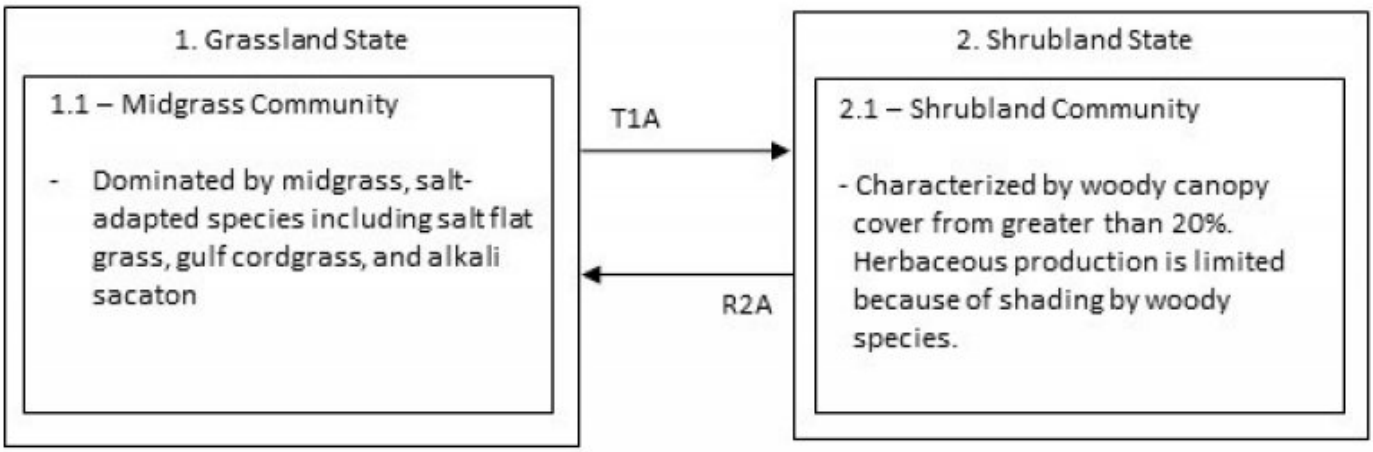
The Northern Rio Grande Plain MLRA was a disturbance-maintained system. Prior to European settlement (pre-1825), fire and grazing were the two primary forms of disturbance. Grazing by large herbivores included antelope, deer, and small herds of bison. The infrequent but intense, short-duration grazing 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 site.

Precipitation patterns are highly variable. Long-term droughts, occurring three to four times per century, cause shifts in species composition by causing die-off of seedlings, less drought-tolerant species, and some woody species. Droughts also reduce biomass production and create open space, which is colonized by opportunistic species when precipitation increases. Wet periods allow midgrasses to increase in dominance.

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 mid-grasses 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.

Today, primarily beef cattle graze rangeland and pastureland. However, horse numbers are increasing rapidly on small acreage properties in the region. There are some areas where dairy cattle, poultry, goats, and sheep are locally important. Whitetail deer, wild turkey, bobwhite quail, and dove are the major wildlife species, and hunting leases are a major source of income for many landowners in this area. Introduced pasture has been established on many acres of old cropland and in areas with deeper soils. Buffelgrass is the most common introduced plant on the site and to a lesser extent bermudagrass, guineagrass (*Urochloa maxima*), and kleingrass, which are more commonly used for hay. Cropland is found in the valleys, bottomlands, and deeper upland soils. Wheat (Triticum spp.), oats Avena spp.), forage and grain sorghum (Sorghum spp.), cotton (Gossypium spp.), and corn (*Zea mays*) are major crops in the region.

State and transition model



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

Figure 8. STM

State 1
Grassland

Dominant plant species

- saltgrass (*Distichlis spicata*), grass
- gulf cordgrass (*Spartina spartinae*), grass

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

Dominant plant species

- mesquite (*Prosopis*), shrub

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

As a historic tall/midgrass prairie, this site was occupied by bison, antelope, deer, quail, turkey, and dove. This site was also used by many species of grassland songbirds, migratory waterfowl, and coyotes. This site now provides forage for livestock and is still used by quail, dove, migratory waterfowl, grassland birds, coyotes, and deer.

Feral hogs (Sus scrofa) can be found on most ecological sites in Texas. Damage caused by feral hogs each year includes, crop damage by rutting up crops, destroyed fences, livestock watering areas, and predation on native wildlife, and ground-nesting birds. Feral hogs have few natural predators, thus allowing their population to grow to high numbers.

Wildlife habitat is a complex of many different plant communities and ecological sites across the landscape. Most animals use the landscape differently to find food, shelter, protection, and mates. Working on a conservation plan for the whole property, with a local professional, will help managers make the decisions that allow them to realize their goals for wildlife and livestock.

Grassland State (1): This state provides the maximum amount of forage for livestock such as cattle. It is also utilized by deer, quail and other birds as a source of food. When a site is in the reference plant community phase (1.1) it will also be used by some birds for nesting, if other habitat requirements like thermal and escape cover are near.

Tree/Shrubland Complex (2): This state can be maintained to meet the habitat requirements of cattle and wildlife. Land managers can find a balance that meets their goals and allows them flexibility to manage for livestock and wildlife. Forbs for deer and birds like quail will be more plentiful in this state. There will also be more trees and shrubs to provide thermal and escape cover for birds as well as cover for deer.

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, 9/19/2023

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	05/17/2024
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:**

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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:

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

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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):**

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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:

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17. **Perennial plant reproductive capability:**
