

## Ecological site R083AY005TX Shallow

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Accessed: 05/13/2024

### 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.

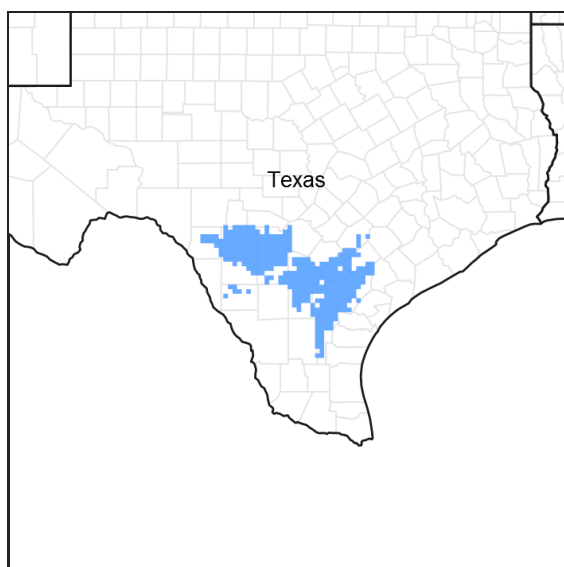


Figure 1. Mapped extent

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

Sites are very shallow to shallow with clay in the soil profile. The lack of depth coupled with the tight nature of the soils cause the community to be sparsely vegetated and droughty.

### Associated sites

R083AY004TX	<b>Shallow Sandy Loam</b>
R083AY008TX	<b>Salty Prairie</b>
R083AY012TX	<b>Loamy Draw</b>
R083AY027TX	<b>Western Clay Loam</b>
R083AY002TX	<b>Shallow Ridge</b>
R083AY017TX	<b>Blackland</b>
R083AY024TX	<b>Tight Sandy Loam</b>

## Similar sites

R083BY005TX	<b>Shallow</b>
R083CY005TX	<b>Shallow</b>

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Pappophorum bicolor</i> (2) <i>Digitaria californica</i>

## Physiographic features

These soils are usually on nearly level to undulating uplands, but some are very steep. Slopes typically range from 1 to 8 percent, but can be 0 to 25 percent. This area is comprised of inland, dissected coastal plains.

**Table 2. Representative physiographic features**

Landforms	(1) Coastal plain > Ridge (2) Coastal plain > Interfluve
Runoff class	Low to very high
Elevation	61–305 m
Slope	0–8%
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) CARRIZO SPRINGS 3W [USC00411486], Carrizo Springs, TX
- (2) CUERO [USC00412173], Cuero, TX
- (3) HONDO [USC00414254], Hondo, TX
- (4) KARNES CITY 2N [USC00414696], Karnes City, TX
- (5) MATHIS 4 SSW [USC00415661], Mathis, TX
- (6) NIXON [USC00416368], Stockdale, TX
- (7) TILDEN 4 SSE [USC00419031], Tilden, TX
- (8) UVALDE 3 SW [USC00419268], Uvalde, TX
- (9) CHARLOTTE 5 NNW [USC00411663], Charlotte, TX
- (10) CROSS [USC00412125], Tilden, TX
- (11) FOWLERTON [USC00413299], Fowlerton, TX
- (12) PEARSALL [USC00416879], Pearsall, TX
- (13) POTEET [USC00417215], Poteet, TX
- (14) CHEAPSIDE [USC00411671], Gonzales, TX
- (15) BEEVILLE 5 NE [USC00410639], Beeville, TX
- (16) DILLEY [USC00412458], Dilley, TX
- (17) FLORESVILLE [USC00413201], Floresville, TX
- (18) GOLIAD [USC00413618], Goliad, TX
- (19) LYTLE 3W [USC00415454], Natalia, TX
- (20) PLEASANTON [USC00417111], Pleasanton, TX
- (21) HONDO MUNI AP [USW00012962], Hondo, TX
- (22) CALLIHAM [USC00411337], Calliham, TX

## Influencing water features

Water features are not an influencing factor.

## Wetland description

N/A

## Soil features

The soils are very shallow to shallow, well drained, moderately slowly permeable to impermeable that formed in dense clayey materials. Soil series correlated to this site include: Ecletto, Fashing, Parrita, Pettus, Valco, and Weigang.

**Table 4. Representative soil features**

Parent material	(1) Alluvium—sedimentary rock (2) Residuum—sandstone
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Surface texture	(1) Clay (2) Clay loam (3) Sandy clay loam (4) Loam
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	36–51 cm
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	0–1%
Available water capacity (0-101.6cm)	2.54–10.16 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–25%
Subsurface fragment volume >3" (Depth not specified)	0–5%

## 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 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 less drought-tolerant 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 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.

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. White-tailed 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 (*Cynodon dactylon*), guineagrass (*Urochloa maxima*), and kleingrass

(*Panicum coloratum*), 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

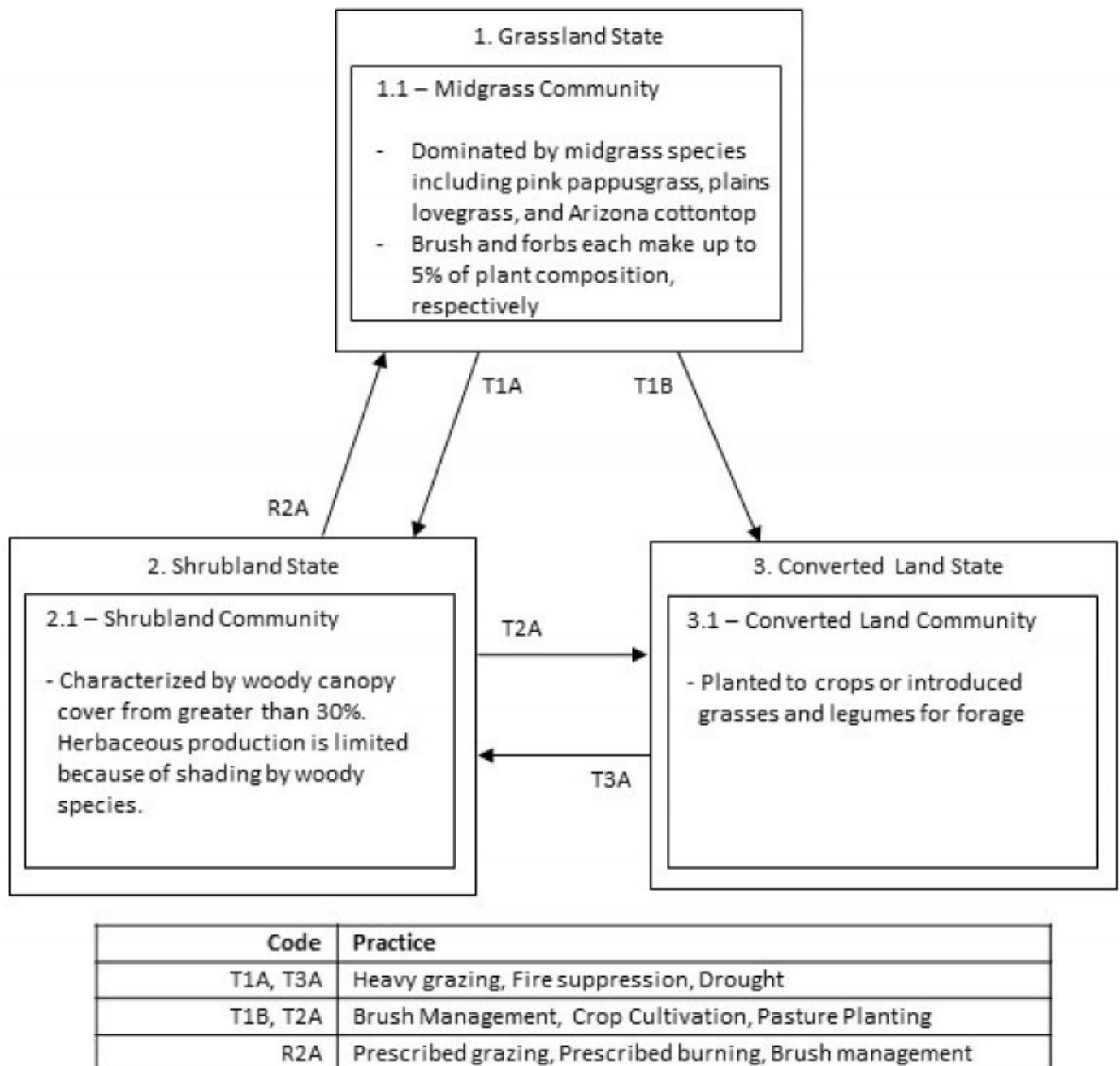


Figure 8. STM

## State 1 Grassland

The reference state is considered to be representative of the range of variation under pre-Euro settlement conditions. This state is characterized by warm-season grasses and shrubs. Community phase changes are primarily driven by wildfire and periodic grazing.

### Dominant plant species

- pink pappusgrass (*Pappophorum bicolor*), grass
- sideoats grama (*Bouteloua curtipendula*), grass

## **Community 1.1**

### **Midgrass**

The shallow, tight nature of the soils make this a sparsely vegetated community. The soils often cause droughty conditions and quickly become hard. Grasses include pink pappusgrass (*Pappophorum bicolor*), sideoats grama (*Bouteloua curtipendula*), plains lovegrass (*Eragrostis intermedia*), Arizona cottontop (*Digitaria californica*), and slim tridens (*Tridens muticus*). Shrubs make up about five percent of the plant community and perennial forbs make up about five percent. Proper grazing management and regular fire intervals will keep the community intact.

## **State 2**

### **Shrubland**

#### **Dominant plant species**

- mesquite (*Prosopis*), shrub
- guajillo (*Acacia berlandieri*), shrub
- threeawn (*Aristida*), grass

## **Community 2.1**

### **Shrubland**

With heavy grazing pressure, lack of fire, and drought, plants such as red grama (*Bouteloua trifida*), threeawn (*Aristida* spp.), Hall's panicum (*Panicum hallii*), plains bristlegrass (*Setaria vulpisea*), and fall witchgrass (*Digitaria cognata*) increase or invade. Brush plants like mesquite (*Prosopis* spp.), guajillo (*Senegalia berlandieri*), cenizo (*Tetrazygia urbannii*), condalia (*Condalia* spp.), guayacan (*Guaiacum angustifolium*), agarito (*Mahonia trifoliolata*), and pricklypear (*Opuntia* spp.) also increase and invade. Gray coldenia is a common forb.

## **State 3**

### **Converted Land**

#### **Dominant plant species**

- buffelgrass (*Pennisetum ciliare*), grass
- Bermudagrass (*Cynodon dactylon*), grass

## **Community 3.1**

### **Converted Land**

Typically, rootplowing and raking is utilized to remove the woody vegetation. A seedbed is then prepared, and the area is planted into grass or crops. This site has historically been planted to buffelgrass, Bermudagrass, or introduced bluestems. Now, because of the availability of seed, landowners can also replant with native species. To maintain this seeded state, herbicides must be used to control woody seedlings that invade as soon as the pasture is established. Not only is there a long-lived seed source of woody species, additional seeds are brought in by grazing animals and domestic livestock.

## **Transition T1A**

### **State 1 to 2**

Heavy continuous grazing, lack of fire, and drought will transition this site into a Shrubland State (2). The site is characterized by greater than 30 percent woody canopy cover.

## **Transition T1B**

### **State 1 to 3**

Land managers may wish to use this site as pasture or, less commonly, cropland. If woody species are present, brush management is necessary to remove trees and shrubs. Seedbed preparation and pasture planting are the final steps needed.

## **Restoration pathway R2A**

### **State 2 to 1**

Prescribed grazing, prescribed burning, and brush management are required to restore the community back to a Grassland State (1). Removal of woody species below 30 percent allows more light and nutrients to herbaceous species. Reducing grazing pressure will allow plants to regain vigor and re-establish.

## **Transition T2A**

### **State 2 to 3**

Land managers may wish to use this site as pasture or, less commonly, cropland. Brush management, followed by seedbed preparation and pasture planting are needed to create a successful pasture.

## **Transition T3A**

### **State 3 to 2**

Without brush management, woody species will encroach and grow into the overstory. The site will transition to a Shrubland State (2) once the woody canopy cover is greater than 30 percent.

## **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. 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.

Converted Land State (3): The quality of wildlife habitat this site will produce is extremely variable and is influenced greatly by the timing of rain events. This state is often manipulated to meet landowner goals. If livestock production is the main goal, it can be converted to pastureland. It can also be planted to a mix of grasses and forbs that will benefit both livestock and wildlife. A mix of forbs in the pasture could attract pollinators, birds and other types of wildlife. Food plots can also be planted to provide extra nutrition 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	05/13/2024
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:**
- 
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):**

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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:**

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