

# Ecological site R083AY019TX

## Gray Sandy Loam

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### 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): 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 Gray Sandy Loam refers to the gray-colored, sandy loam surfaces found on the ecological site. High amounts of calcium carbonates in the upper soil profile are responsible for the gray colors and alkalinity.

### Associated sites

R083AY002TX	Shallow Ridge
R083AY017TX	Blackland
R083AY023TX	Sandy Loam
R083AY007TX	Lakebed
R083AY009TX	Clayey Bottomland
R083AY013TX	Loamy Bottomland

R083AY024TX	Tight Sandy Loam
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### Similar sites

R083BY019TX	Gray Sandy Loam
R083CY019TX	Gray Sandy Loam
R083DY019TX	Gray Sandy Loam

Table 1. Dominant plant species

Tree	(1) <i>Prosopis glandulosa</i> var. <i>glandulosa</i>
Shrub	(1) <i>Leucophyllum frutescens</i> (2) <i>Acacia berlandieri</i>
Herbaceous	(1) <i>Heteropogon contortus</i> (2) <i>Setaria vulpiseta</i>

### Physiographic features

These soils are on nearly level to moderately steep stream terraces. Slopes range from 0 to 5 percent. This area is comprised of inland, dissected coastal plains.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Interfluve (2) Coastal plain > Ridge (3) Coastal plain > Paleoterrace
Runoff class	Negligible to low
Elevation	60 – 310 m
Slope	0 – 10 %
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)	220-250 days
Freeze-free period (characteristic range)	260-370 days
Precipitation total (characteristic range)	640-810 mm
Frost-free period (actual range)	210-260 days
Freeze-free period (actual range)	250-370 days
Precipitation total (actual range)	610-940 mm
Frost-free period (average)	240 days
Freeze-free period (average)	310 days
Precipitation total (average)	740 mm

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

- (22) CALLIHAM [USC00411337], Calliham, TX

### Influencing water features

Water features do not influence this site.

### Wetland description

N/A

### Soil features

The soils are very deep, well drained, moderate to moderately slowly permeable over weakly to strongly cemented sandstone. The site gets its name from the gray colors in the soil resulting from calcium carbonates, making the soils alkaline. Soil series correlated to this site include: Atco, Colibro, Gertrudis, Pernitas, Sarnosa, and Saspamco.

**Table 4. Representative soil features**

Parent material	(1) Alluvium – sedimentary rock (2) Residuum – calcareous sandstone
Surface texture	(1) Fine sandy loam (2) Loam (3) Sandy clay loam
Family particle size	(1) Fine-loamy (2) Coarse-loamy
Drainage class	Well drained
Permeability class	Moderate to moderately slow
Soil depth	200 cm
Available water capacity (0-101.6cm)	12.7 – 15.24 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 60 %
Electrical conductivity (0-101.6cm)	Not specified

Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	7.9 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

### 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

### Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	Tall/Midgrasses			448-1121	

	tanglehead	HECO10	<i>Heteropogon contortus</i>	112-392	-
	false Rhodes grass	TRCR9	<i>Trichloris crinita</i>	112-392	-
	multiflower false Rhodes grass	TRPL3	<i>Trichloris pluriflora</i>	112-392	-
2	<b>Midgrasses</b>			841-1793	
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	224-448	-
	silver beardgrass	BOLA2	<i>Bothriochloa laguroides</i>	168-392	-
	pink pappusgrass	PABI2	<i>Pappophorum bicolor</i>	168-392	-
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	140-224	-
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	140-224	-
	Texas bristlegrass	SETE6	<i>Setaria texana</i>	84-168	-
3	<b>Shortgrasses</b>			392-785	
	hooded windmill grass	CHCU2	<i>Chloris cucullata</i>	84-140	-
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	34-112	-
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	34-112	-
	Texas wintergrass	NALE3	<i>Nassella leucotricha</i>	0-112	-
	vine mesquite	PAOB	<i>Panicum obtusum</i>	0-112	-
	lovegrass tridens	TRER	<i>Tridens eragrostoides</i>	34-112	-
	slim tridens	TRMU	<i>Tridens muticus</i>	34-112	-
	threeawn	ARIST	<i>Aristida</i>	34-112	-
	buffalograss	BODA2	<i>Bouteloua dactyloides</i>	34-112	-
<b>Forb</b>					
4	<b>Forbs</b>			112-224	
	Illinois bundleflower	DEIL	<i>Desmanthus illinoensis</i>	6-28	-
	slimleaf heliotrope	HETO	<i>Heliotropium torreyi</i>	6-28	-
	yellow puff	NELU2	<i>Neptunia lutea</i>	6-28	-
	bushsunflower	SIMSI	<i>Simsia</i>	6-28	-
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	6-28	-
	woody crinklemat	TICAC	<i>Tiquilia canescens var. canescens</i>	6-28	-
	Forb, annual	2FA	<i>Forb, annual</i>	6-28	-
	Forb, perennial	2FP	<i>Forb, perennial</i>	6-28	-
	Texas Indian mallow	ABFR3	<i>Abutilon fruticosum</i>	6-28	-
	prairie broomweed	AMDR	<i>Amphiachyris dracunculoides</i>	6-28	-
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	6-28	-
<b>Shrub/Vine</b>					
5	<b>Shrubs</b>			112-202	
	Texas barometer bush	LEFR3	<i>Leucophyllum frutescens</i>	17-34	-
	guajillo	ACBE	<i>Acacia berlandieri</i>	17-34	-
	blackbrush acacia	ACRI	<i>Acacia rigidula</i>	17-34	-
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	11-22	-
	Brazilian bluewood	COHO	<i>Condalia hookeri</i>	11-22	-
	Texan hogplum	COTET	<i>Colubrina texensis var. texensis</i>	11-22	-
	Texas persimmon	DITE3	<i>Diospyros texana</i>	11-22	-
	Texas kidneywood	EYTE	<i>Eysenhardtia texana</i>	11-22	-
	stretchberry	FOPU2	<i>Forestiera pubescens</i>	11-22	-
	Texas lignum-vitae	GUAN	<i>Guaiacum angustifolium</i>	11-22	-
	catclaw acacia	ACGR	<i>Acacia greggii</i>	11-22	-

	desert yaupon	SCCU4	<i>Schaefferia cuneifolia</i>	11-22	-
	lime pricklyash	ZAFA	<i>Zanthoxylum fagara</i>	11-22	-
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	11-22	-
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	6-11	-
	Rio Grande beebrush	ALMA9	<i>Aloysia macrostachya</i>	6-11	-
<b>Tree</b>					
6	<b>Trees</b>			0-22	
	honey mesquite	PRGLG	<i>Prosopis glandulosa var. glandulosa</i>	11-34	-
	live oak	QUVI	<i>Quercus virginiana</i>	0-22	-

**Table 6. Community 1.2 plant community composition**

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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**Table 7. Community 2.1 plant community composition**

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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**Table 8. Community 3.1 plant community composition**

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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**Table 9. Community 3.2 plant community composition**

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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## 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. 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. This rating system provides general guidance as to animal preference for plant species. It also indicates possible competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community. For wildlife, plant preferences for food and plant suitability for cover are rated. Refer to habitat guides for a more complete description of a species habitat needs.

## Hydrological functions

Peak rainfall periods occur in May and June from thunderstorms and in September and October from tropical systems. Rainfall events may be high (three to five inches per event) and intense. Extended periods (45 to 60 days) of little to no rainfall during the growing season are common. Because of the topography of this site, erosion may be significant, especially in the Tree/Shrubland Complex (2), where there is less herbaceous cover and more bare ground. This increase in bare ground will also negatively affect the amount of water that is able to infiltrate the soil during rain events. This site provides little water for aquifer recharge because, when wet, infiltration is slow.

## Recreational uses

Hunting, bird watching, and photography are common activities.

## **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

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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.

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Date	09/17/2012
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

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

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2. **Presence of water flow patterns:** Few water flow patterns are normal for this site due to landscape position and slopes.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals would have been uncommon for this site.

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

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

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Small-to-medium sized litter may move short distances during intense storms.

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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):** Soil surface is resistant to erosion. Soil stability class range is expected to be 4 to 6.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is 6 to 12 inches thick with colors ranging from very dark gray to pale brown with subangular blocky structure. SOM is less than three percent.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** A high canopy cover of bunch, rhizomatous, and stoloniferous grasses will help minimize runoff and maximize infiltration. Grasses should comprise approximately 90 percent of total annual production by weight. Shrubs will comprise about five percent by weight.

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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):** None.

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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: Perennial Midgrasses > Perennial Tall/Midgrasses >>

Sub-dominant: Perennial Shortgrasses > Forbs > Shrubs > Trees

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Potential for 5 to 15 percent plant mortality of perennial bunchgrasses during extreme drought

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14. **Average percent litter cover (%) and depth ( in):** 5 to 15 percent litter cover.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,700 to 4,200 pounds per acre.

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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: Cenizo, blackbrush, guajillo, mesquite, Old World bluestems, and buffelgrass.**

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**17. Perennial plant reproductive capability: All species should be capable of reproducing.**

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