

## 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.

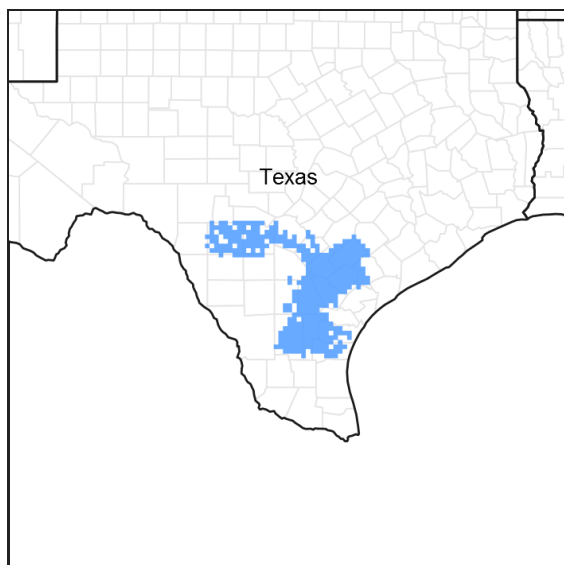


Figure 1. Mapped extent

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 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	<b>Shallow Ridge</b>
R083AY017TX	<b>Blackland</b>
R083AY023TX	<b>Sandy Loam</b>
R083AY007TX	<b>Lakebed</b>
R083AY009TX	<b>Clayey Bottomland</b>
R083AY013TX	<b>Loamy Bottomland</b>
R083AY024TX	<b>Tight Sandy Loam</b>

## Similar sites

R083BY019TX	<b>Gray Sandy Loam</b>
R083CY019TX	<b>Gray Sandy Loam</b>
R083DY019TX	<b>Gray Sandy Loam</b>

**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	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) 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
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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	203 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)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
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)	0–2%

## 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.

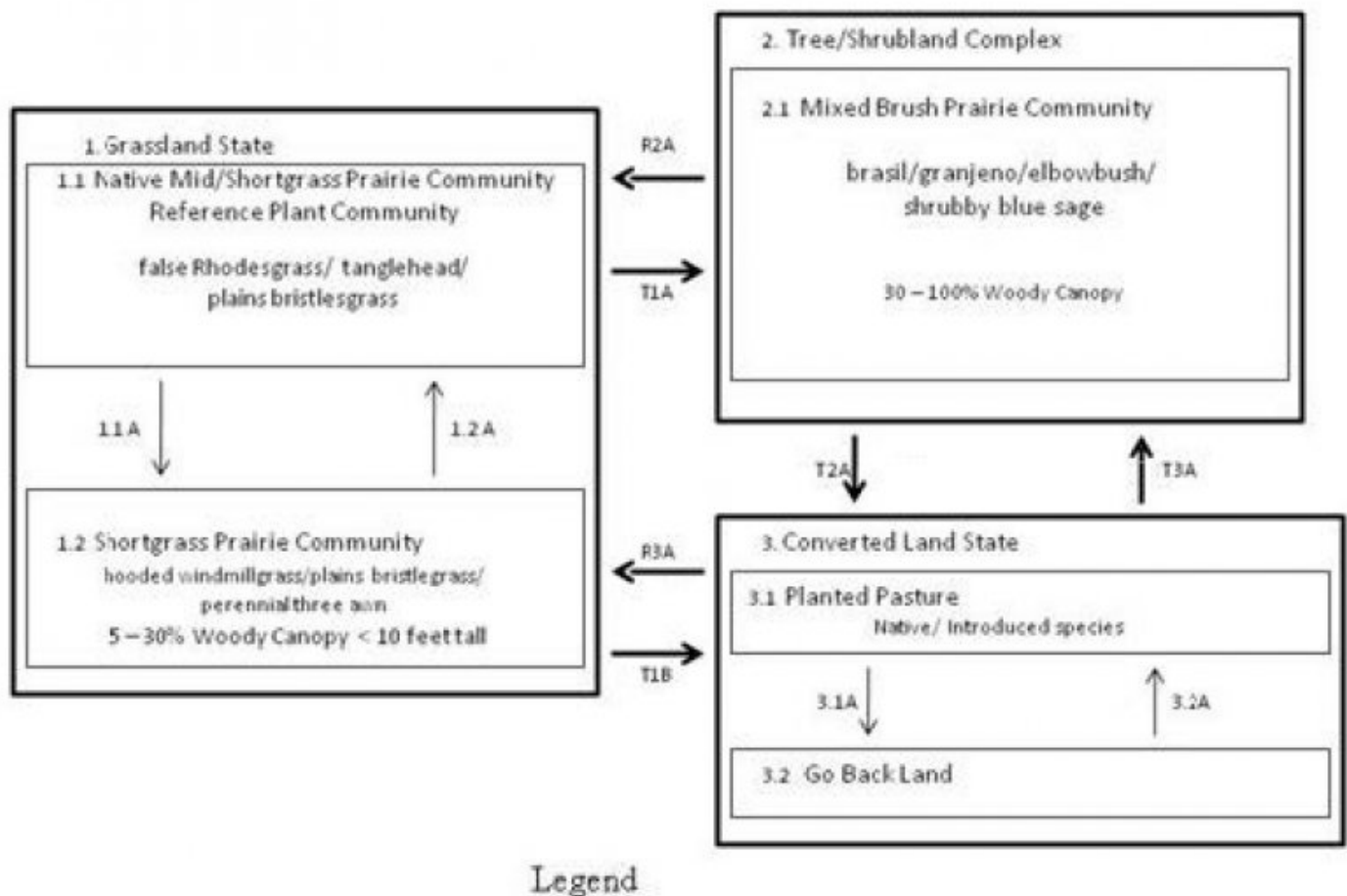
Precipitation patterns are highly variable. Long-term droughts, occurring three to four times per century, cause shifts in species composition by causing die-off of seedlings, less drought-tolerant species, and some woody species. Droughts also reduce biomass production and create open space, which is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



- 1.1A – Heavy Continuous Grazing, No Fire, No Brush Management
- 1.2A – Prescribed Grazing, Prescribed Burning, Brush Management
- 3.1A – Heavy Continuous Grazing, No Fire, Brush Invasion
- 3.2A – Heavy Continuous Grazing, No Fire, Brush Invasion
- T1A – Heavy Continuous Grazing, No Fire, Brush Invasion
- R2A – Brush Management, Prescribed Burning, Prescribed Grazing
- T2A – Brush Management, Range Planting, Pasture Planting
- T3A – Heavy Continuous Grazing, No Fire, Brush Invasion
- T1B – Brush Management, Pasture Planting, Range Planting, Prescribed Grazing

## State 1 Grassland

### Dominant plant species

- false Rhodes grass (*Trichloris crinita*), grass
- Arizona cottontop (*Digitaria californica*), grass

## Community 1.1 Native Mid/Shortgrass Prairie

This Mid/Shortgrass Prairie Community (1.1) developed under natural disturbance regimes spanning thousands of

years. Composition of grasses makes up 90 percent of annual production. Late succession plants such as false rhodesgrass, Arizona cottontop (*Digitaria californica*), and tanglehead make up about 25 percent of this community. Increaser plants, or more resilient species, make up 65 percent. These grasses include plains bristlegrass, pink pappusgrass, silver bluestem, and hooded windmillgrass along with threeawns and other shortgrasses. Perennial forbs, shrubs, and woody species make up the remainder. Annual forbs occur in varying amounts in response to grazing intensity, fire, drought, or excessive precipitation. The occurrence of annual forbs is sporadic and usually short-lived, mostly depending on rainfall events. This community is productive and can be managed to attain many landowner goals for livestock, wildlife, or recreation. The droughty nature of this site increases competition between species for water and nutrients; this tends to promote a high diversity in species composition because no one species can easily dominate the plant community. Rainfall differences across the region will cause subtle changes in plant community and overall productivity, which is displayed as high and low values in the annual production tables.

**Table 5. Annual production by plant type**

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1681	2690	3699
Forb	112	168	224
Shrub/Vine	112	157	202
Tree	—	11	22
<b>Total</b>	<b>1905</b>	<b>3026</b>	<b>4147</b>

**Table 6. Ground cover**

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	0-5%
Grass/grasslike foliar cover	70-90%
Forb foliar cover	10-15%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-25%
Surface fragments >0.25" and <=3"	0-1%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0-5%

**Table 7. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	0-1%	0-1%	10-40%	10-15%
>0.15 <= 0.3	0-1%	0-1%	10-40%	10-15%
>0.3 <= 0.6	0-1%	0-5%	40-100%	10-15%
>0.6 <= 1.4	0-1%	0-5%	10-25%	—
>1.4 <= 4	0-1%	—	—	—
>4 <= 12	0-1%	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

Figure 9. Plant community growth curve (percent production by month). TX5125, Midgrass Grassland Community. Warm-season production from grass, forbs, and woody species..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	5	15	20	20	5	5	10	10	5	3

## Community 1.2 Shortgrass Prairie

The Shortgrass Prairie Community (1.2) developed as a result of continued heavy grazing, an absence of the historic fire regime, and lack of brush management. This community would also be driven by weather conditions and be more common on sites that have higher slopes and in areas of decreased rainfall. In comparison to the Reference Plant Community (1.1) the Shortgrass Prairie Community (1.2) has reduced biomass production and litter accumulation, which causes subtle impacts to the water, mineral, and energy cycles. The loss of thermal protection and increased water runoff potential will start to negatively affect the plant available water in the soil. In this situation reduced rainfall and prolonged droughts will begin to have more of an impact on plant production. As midgrasses such as false rhodesgrass, plains bristlegrass, and tanglehead decrease, grasses such as hooded windmillgrass, red grama (*Bouteloua trifida*), and three awn species increase. As competition for resources from taller grasses decreases, curly mesquite will also begin to increase. Reduced fuel loads result in reduced fire frequency/intensity. Annual and perennial forbs often increase as a result of decreased competition for sunlight and moisture. Introduced grass species like Kleberg bluestem (*Dichanthium annulatum*) start to invade. Woody species such as lotebush, granjeno, blackbrush, brasil, and mesquite will begin to establish dominance and as their canopy cover increases herbaceous production will decrease. While the appearance of introduced plants prevents a full restoration to the Reference Plant Community, some of these plants do perform the same functions as native species. Management activities can slow down the increase of introduced plants if this is the management goal.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1345	1961	2578
Shrub/Vine	392	813	1233
Forb	168	224	280
Tree	—	28	56
<b>Total</b>	<b>1905</b>	<b>3026</b>	<b>4147</b>

Figure 11. Plant community growth curve (percent production by month). TX5128, Shortgrass Dominant Community. Shortgrass dominates the site with decreasing midgrasses and increasing shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	5	15	20	21	5	5	10	10	5	2

## Pathway 1.1A Community 1.1 to 1.2

The Mid/Shortgrass Prairie Community (1.1) is the reference plant community that would have dominated the Gray Sandy Loam ecological site for thousands of years. Because of human influence this community is rarely found today. The midgrasses that dominated the landscape are highly preferred by livestock and are easily eliminated from the plant community with heavy continuous grazing. Climate also plays a large role on this site. During drought conditions, increaser plants continue growing while more productive plants are less able to thrive. The site will begin to be dominated by shortgrasses and increased bare ground. The historic fire regime has also been changed so that intermittent fires every three to seven years, which would decrease woody plant encroachment and encourage midgrass dominance, have been prevented to protect livestock and societal interests. These factors cause a shift from a Native Mid/Shortgrass Prairie Community (1.1) to a Shortgrass Prairie Community (1.2).

## Pathway 1.2A

### Community 1.2 to 1.1

The restoration to the Reference Plant Community (1.1) can be accomplished by installation of prescribed grazing with appropriate stocking rates. If the herbaceous component of this community remains healthy and maintains at least 85 to 90 percent ground cover, including live plants and litter, the woody component of this site will remain stable and new seedling growth will be inhibited. Individual Plant Treatment (IPT) and prescribed burning will be the most efficient and economical ways to manage brush species encroachment. The use of prescribed fire in conjunction with prescribed grazing enhances the recovery process, but because of the droughty nature of this site, timing and weather conditions are critical to successful restoration efforts. Mechanical or chemical brush management is also feasible and relatively economical because this community has less than a 30 percent canopy of woody species. Once initial woody plant management has been achieved, periodic burning, reduced stocking, and prescribed grazing will cause a transition towards the Reference Plant Community over time. If the landowner wants to speed this transition, some range planting can be done to increase the number of desired species.

## State 2

### Tree/Shrubland

#### Dominant plant species

- lotebush (*Ziziphus obtusifolia*), shrub
- hackberry (*Celtis*), shrub

## Community 2.1

### Mixed Brush Prairie

A threshold has been crossed between the Grassland State (1) and the Tree/Shrubland Complex (2). This Mixed Brush Prairie Community (2.1) has developed because of continuous heavy grazing, loss of fire as a management tool, greatly altered water and energy cycles, and invasion of woody plants. Episodic droughts will hasten this process. The shift from the Shortgrass Prairie Community (1.2) to the Mixed Brush Prairie Community (2.1) can happen within a period of three to seven years under certain conditions. In most cases the shrub community is diverse and no one species will account for more than 20 percent of the shrub canopy, but occasionally guajillo, blackbrush, cenizo, or mesquite can create nearly 100 percent canopy cover. Other woody species such as lotebush, granjeno, guajillo, desert yaupon (*Schaefferia cuneifolia*), prickly pear (*Opuntia engelmannii*), elbowbush, brasil, lime pricklyash (*Zanthoxylum fagara*), guayacan (*Guaiacum angustifolium*), and shrubby blue sage will occur as part of the plant community. Shrubby blue sage and cenizo are very common invaders on this site and will dominate open areas between shrub mottes; this reduces or even prevents herbaceous production. Average shrub canopy cover in this state is about 60 percent, but can range from 30 to 100 percent. The amount of bareground and herbaceous production will vary with weather conditions, grazing pressure, and as the grass community diminishes. Soils with a more developed argillic horizon will support a denser shrub community. Shrub canopy height typically ranges from 6 to 10 feet, but in areas with relatively old plants mesquite trees can be more than 15 feet tall with dense understory of mixed brush, creating large mottes. Grass production is severely reduced in this state and shortgrasses like perennial three awn, Hall's panicum (*Panicum hallii*), red grama (*Bouteloua trifida*), and lovegrass tridens (*Tridens eragrostoides*) will be most common. On the northeastern range of this ecological site, live oak trees (*Quercus virginiana*) will become part of the landscape and may make up a small portion of the plant community. This community may be much better wildlife habitat than the previous state because of the increased amount of woody cover and browse. With increased emphasis on white-tailed deer and bobwhite quail, many landowners choose to manage their land in this condition to enhance wildlife populations.

Table 9. Annual production by plant type



Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	1177	1821	2466
Grass/Grasslike	560	953	1345
Tree	112	168	224
Forb	56	84	112
<b>Total</b>	<b>1905</b>	<b>3026</b>	<b>4147</b>

Figure 13. Plant community growth curve (percent production by month).  
TX5131, Shrubland Complex Community, >50% woody canopy. Woodland  
Community with 50-80% woody canopy cover..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	5	10	18	15	5	9	15	9	5	5

### State 3 Converted Land

#### Dominant plant species

- buffelgrass (*Pennisetum ciliare*), grass

### Community 3.1 Planted Pasture

Typically dozing and raking or Rhome disking is utilized to remove the woody vegetation in transition from State 1 and 2. A seedbed is then prepared, and the area is planted into grass, or rarely will it be planted into crops or wildlife food plots. This site does not generally receive enough rainfall to create successful crops year after year, so cash crops are not typical. If introduced species are planted this site may be more productive than the original plant community. Inputs such as fertilizer, herbicide, and adequate precipitation may be necessary to maintain high productivity. 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 seek to invade as soon as the pasture is established. Not only is there a long-lived seed source, additional seeds are brought in by grazing animals and domestic livestock.

Table 10. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1905	3026	4147
<b>Total</b>	<b>1905</b>	<b>3026</b>	<b>4147</b>

Figure 15. Plant community growth curve (percent production by month).  
TX5132, Converted Land Community - Pastureland. Converting into  
pastureland by planting native and introduced grass species..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	5	15	20	20	5	5	15	8	4	1

### Community 3.2 Go Back Land

This community develops after land has been left to fallow without management inputs or after unsuccessful brush management practices. It is typified by the dominance of woody species, very little herbaceous grass production, and large areas covered by tree-leaf litter or bare ground. This plant community has low species diversity and is commonly dominated by mesquite, cenizo, or guajillo. Re-infestation of woody seedlings happens in a relatively short time period of two to five years on abandoned cropland or pastures.

**Table 11. Canopy structure (% cover)**

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	0-1%	0-1%	10-30%	10-15%
>0.15 <= 0.3	0-1%	0-1%	20-50%	10-15%
>0.3 <= 0.6	0-1%	40-60%	10-30%	—
>0.6 <= 1.4	10-20%	40-60%	—	—
>1.4 <= 4	10-20%	40-60%	—	—
>4 <= 12	10-20%	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

**Figure 16. Plant community growth curve (percent production by month).  
TX5136, Converted Land Community - Woody Seedling Encroachment.  
Converted Land Community that has been encroached by woody seedlings  
due to abandonment of crop and pastureland..**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	5	10	18	15	5	9	15	9	5	5

### **Pathway 3.1A Community 3.1 to 3.2**

The transition from Planted Pasture (3.1) to Go Back Land (3.2) occurs when fields or pastures are left to fallow without management. Woody species begin to invade the site and will continue to grow and eventually dominate the plant community. Generally, pastureland will transition to the Tree/Shrubland Complex (2) and not to the Go Back Land plant community, but this depends on pasture management and the amount of time the grass community is healthy and dominant.

### **Pathway 3.2A Community 3.2 to 3.1**

Many land managers may want to utilize this site as pastureland. To achieve this transition, practices such as dozing and raking will be necessary. After the land has been cleared and an appropriate seedbed prepared the pasture can be planted.

### **Transition T1A State 1 to 2**

The transition from the Grassland State (1) to the Tree/Shrubland Complex (2) can happen within three to seven years. This transition can be driven by persistently dry weather conditions, grazing management, and the lack of fire and brush management practices. Overstocking the site with grazing animals will put pressure on the herbaceous plant component of the community. Increased bare ground becomes a large problem affecting the hydrologic cycle. As herbaceous ground cover decreases runoff and evaporation during rainfall events will increase, causing less water to infiltrate into the soil for plant use. If the woody component is not managed, it will begin to dominate the landscape and out-compete grasses and forbs for water, sunlight, and resources.

### **Transition T1B State 1 to 3**

### **Restoration pathway R2A State 2 to 1**

Major inputs are required to restore this community to the Grassland State (1). Mechanical brush management practices such as dozing or using a Rhyme disk are the most common options. Chaining and roller chopping are mechanical practices which will be short-lived and will typically result in thicker, harder to manage brush stands and will encourage brush seedlings. Chemical brush management is more difficult because of the highly diverse mixed brush community. Follow-up conservation practices such as Individual Plant Treatment for woody re-growth and new seedlings and prescribed grazing will be necessary for several years after the initial brush management to maintain an improved plant community. Depending on local conditions it may also be necessary to re-introduce a seed source for desired native plant species through range planting. Successful restoration of the Mid/Shortgrass Prairie Community (1.1) is highly dependent on rainfall and follow up management activities which promote the establishment of native grasses and forbs.

## Transition T2A State 2 to 3

## Transition T3A State 3 to 2

In time, this site will revert to the Tree/Shrubland Complex (2) on its own, but usually this timeline is impractical for landowners. Prescribed grazing along with various brush management practices will be necessary to achieve this transition. This phase is very unproductive for herbaceous plants and it could take years for desirable plant species to begin to re-establish.

## Additional community tables

Table 12. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall/Midgrasses</b>			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</i> var. <i>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</i> var. <i>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>Guaiaacum 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</i> var. <i>glandulosa</i>	11–34	–
	live oak	QUVI	<i>Quercus virginiana</i>	0–22	–

## 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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Contact for lead author	361-241-0609
Date	09/17/2012
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

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

- 
2. **Presence of water flow patterns:** Few water flow patterns are normal for this site due to landscape position and slopes.
- 
3. **Number and height of erosional pedestals or terracettes:** Pedestals would have been uncommon for this site.
- 
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.
- 
5. **Number of gullies and erosion associated with gullies:** None.
- 
6. **Extent of wind scoured, blowouts and/or depositional areas:** None.
- 
7. **Amount of litter movement (describe size and distance expected to travel):** Small-to-medium sized litter may move short distances during intense storms.
- 
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.
- 
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.
- 
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.
- 
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.
- 
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
- 
14. **Average percent litter cover (%) and depth ( in):** 5 to 15 percent litter cover.
- 
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.
- 
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.
- 
17. **Perennial plant reproductive capability:** All species should be capable of reproducing.
-