

## Ecological site R083DY023TX Sandy Loam

Last updated: 9/21/2023  
Accessed: 05/15/2024

### 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.

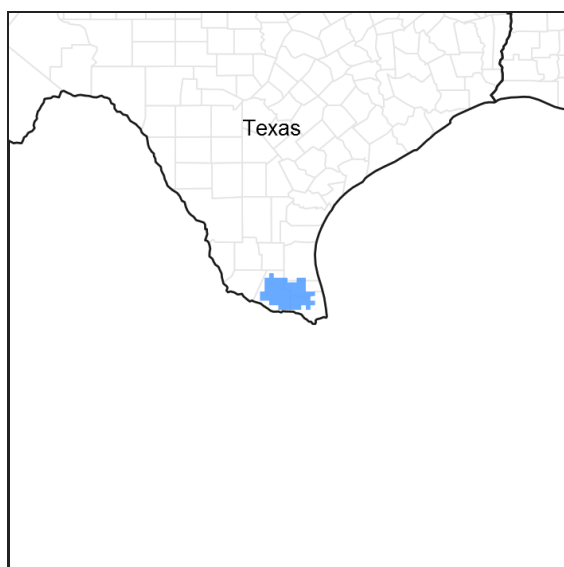


Figure 1. Mapped extent

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): 083D—Lower Rio Grande Plain

Major Land Resource Area (MLRA) 83D makes up about 2,500 square miles (6,475 square kilometers). The towns of Brownsville, Edinburg, Harlingen, McAllen, and Raymondville are in this area. U.S. Highways 77 and 281 terminate in Brownsville and McAllen, respectively. The Santa Ana National Wildlife Area is along the Rio Grande in this area.

### Classification relationships

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

### Ecological site concept

The Sandy Loam ecological site typically has a fine sandy loam or very fine sandy loam surface. Sandy clay loam subsoil horizons are generally present 12 inches below the surface. The reference plant community was a grassland with some woody species.

## Associated sites

R083DY009TX	<b>Clayey Bottomland</b>
R083DY012TX	<b>Ramadero</b>
R083DY024TX	<b>Tight Sandy Loam</b>
R083DY025TX	<b>Clay Loam</b>
R083DY007TX	<b>Lakebed</b>
R083DY019TX	<b>Gray Sandy Loam</b>

## Similar sites

R083AY023TX	<b>Sandy Loam</b>
R083BY023TX	<b>Sandy Loam</b>
R083CY023TX	<b>Sandy Loam</b>
R083EY023TX	<b>Sandy Loam</b>

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Acacia greggii</i> (2) <i>Celtis ehrenbergiana</i>
Herbaceous	(1) <i>Heteropogon contortus</i> (2) <i>Digitaria californica</i>

## Physiographic features

The soils are on nearly level to gently sloping terraces on the Rio Grande delta plain. Slopes range from 0 to 5 percent.

**Table 2. Representative physiographic features**

Landforms	(1) Delta plain > Terrace
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	9–229 m
Slope	0–3%
Water table depth	203 cm
Aspect	Aspect is not a significant factor

## Climatic features

MLRA 83 has a subtropical, subhumid climate. Winters are dry and warm, and the summers are hot and humid. Tropical maritime air masses predominate throughout spring, summer and fall. Modified polar air masses exert considerable influence during winter, creating a continental climate characterized by large variations in temperature. Peak rainfall occurs late in spring and a secondary peak occurs early in fall. Heavy thunderstorm activities increase in April, May, and June. July is hot and dry with little weather variations. Rainfall increases again in late August and September as tropical disturbances increase and become more frequent. Tropical air masses from the Gulf of Mexico dominate during the spring, summer and fall. Prevailing winds are southerly to southeasterly throughout the year except in December when winds are predominately northerly.

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	365 days
Freeze-free period (characteristic range)	365 days
Precipitation total (characteristic range)	559-660 mm
Frost-free period (actual range)	271-365 days
Freeze-free period (actual range)	365 days
Precipitation total (actual range)	533-686 mm
Frost-free period (average)	348 days
Freeze-free period (average)	365 days
Precipitation total (average)	610 mm

## Climate stations used

- (1) HARLINGEN [USC00413943], Harlingen, TX
- (2) SANTA ROSA 3 WNW [USC00418059], Edcouch, TX
- (3) WESLACO [USC00419588], Weslaco, TX
- (4) RAYMONDVILLE [USC00417458], Raymondville, TX
- (5) MERCEDES 6 SSE [USC00415836], Mercedes, TX
- (6) LA JOYA [USC00414911], Mission, TX
- (7) MCALLEN [USC00415701], McAllen, TX
- (8) MISSION 4 W [USC00415972], Mission, TX
- (9) RIO GRANDE CITY [USC00417622], Rio Grande City, TX
- (10) BROWNSVILLE [USW00012919], Brownsville, TX
- (11) MCALLEN MILLER INTL AP [USW00012959], McAllen, TX

## Influencing water features

Water features do not influence this site.

## Wetland description

N/A

## Soil features

The soils are very deep, well drained, and moderately permeable. These soils formed in loamy alluvium. Soil series correlated to this site include: Hargill, and Willacy.

**Table 4. Representative soil features**

Parent material	(1) Alluvium—sedimentary rock
Surface texture	(1) Fine sandy loam
Family particle size	(1) Fine-loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0–2%
Available water capacity (0-101.6cm)	10.16–15.24 cm

Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–6%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

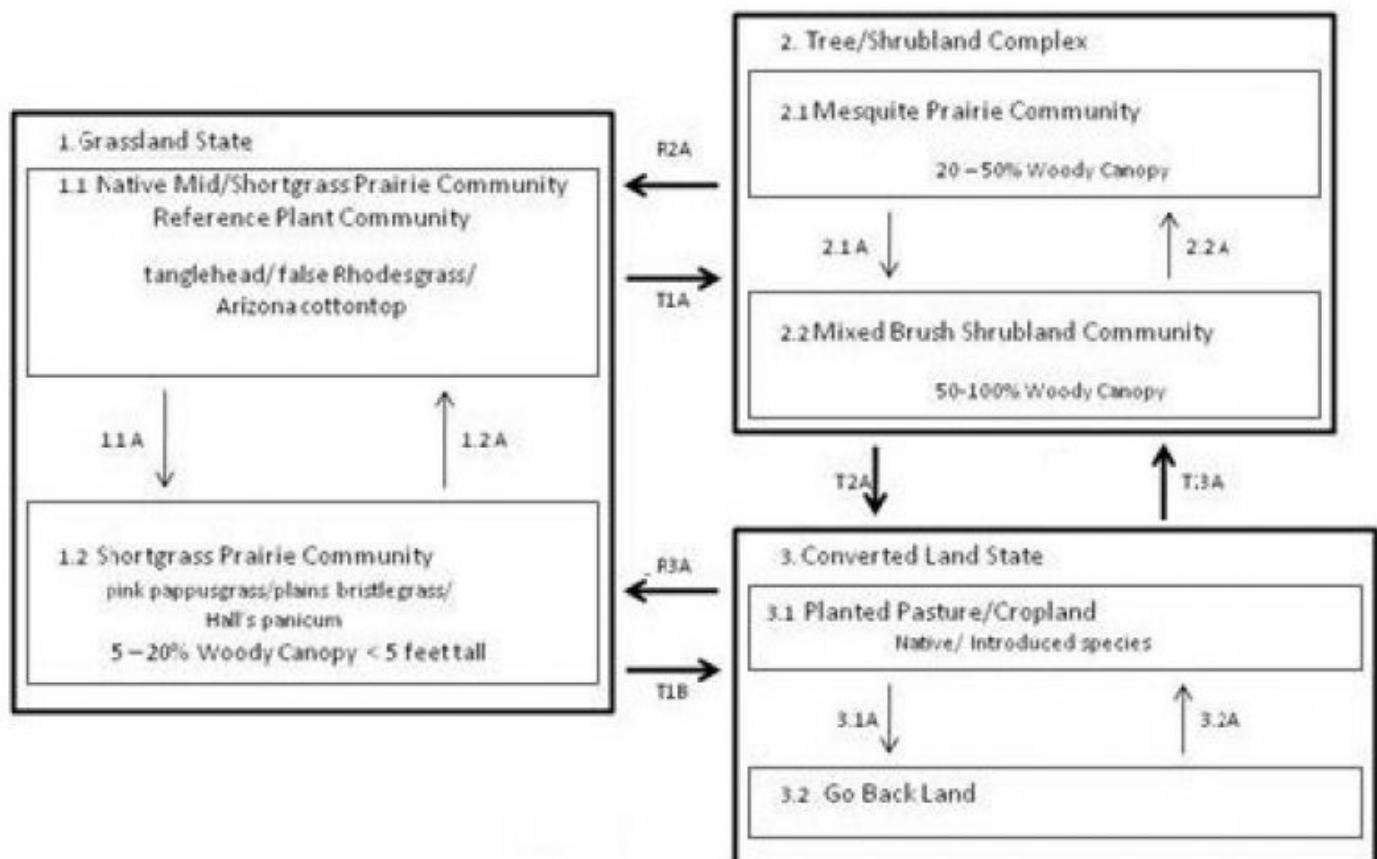
The Lower Rio Grande (MLRA 83D) was a disturbance-maintained system. Prior to European settlement (pre-1825), fire and grazing were the two primary forms of disturbance. Grazing by large herbivores included antelope, deer, and small herds of bison. The infrequent but intense, short-duration grazing by 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 area.

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 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.

The open grassland in this area supports mid prairie grasses with scattered woody plants, perennial forbs, and legumes on soils in the uplands. Twoflower and fourflower trichloris, plains bristlegrass, and lovegrass tridens are among the dominant grasses on these soils. Desert yaupon, spiny hackberry, and blackbrush are the major woody plants. In bottomland areas, tallgrasses and midgrasses, such as switchgrass, giant sacaton, fourflower trichloris, big sandbur, little bluestem, and southwestern bristlegrass, are dominant. Hackberry, mesquite, elm, and palm trees are the major woody plants. Forbs are important but minor components of all plant communities.

Most of this area is cropland or improved pasture that is extensively irrigated. Large acreages of rangeland are grazed mainly by beef cattle and wildlife. The major crops are cotton, grain sorghum, citrus, onions, cabbage, and other truck crops. Almost all the crops are grown under irrigation. Hunting leases for white-tailed deer, quail, white-winged dove, and mourning dove are an important source of income in the area. Some of the major wildlife species in this area are white-tailed deer, javelina, coyote, fox, bobcat, raccoon, skunk, opossum, jackrabbit, cottontail, turkey, bobwhite quail, scaled quail, white-winged dove, and mourning dove.

## State and transition model



### Legend

- 1.1A – Heavy Continuous Grazing, No Fire, No Brush Management
- 1.2A – Prescribed Grazing, Prescribed Burning, Brush Management
- 2.1A – Heavy Continuous Grazing, No Fire, Brush Invasion
- 2.2A – Prescribed Grazing, Prescribed Burning, Brush Management
- 3.1A – Heavy Continuous Grazing, No Fire, Brush Invasion
- 3.2A – Brush Management, Prescribed Burning, Prescribed Grazing, **Seeding**
- 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
- R3A – Brush Management, Prescribed Burning, Prescribed Grazing, **Seeding**

### State 1 Grassland

#### Dominant plant species

- catclaw acacia (*Acacia greggii*), shrub
- spiny hackberry (*Celtis ehrenbergiana*), shrub
- tanglehead (*Heteropogon contortus*), grass
- Arizona cottontop (*Digitaria californica*), grass

## Community 1.1

### Native Mid/Shortgrass Prairie

This Native Mid/Shortgrass Prairie Community (1.1) developed under natural disturbance regimes spanning thousands of years. Composition of midgrasses makes up about 60 percent of annual production, shortgrasses approximately 30 percent, and associated forbs and shrubs make up the remainder. Annual forbs occur in varying amounts in response to grazing intensity, fire, drought, or excessive precipitation. The herbaceous plant structure will vary depending mainly on weather conditions and grazing pressure, but a mix of healthy mid and shortgrass species will maintain enough ground cover to facilitate water infiltration into the soil and outcompete shrub species for light and nutrients. The differences in rainfall will cause subtle changes in plant community and overall productivity. Although the values provided in this report are representative, doing an onsite inventory of plant community and production when planning management decisions will help land managers make sound decisions based on actual conditions on the ground.

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

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2018	3363	4035
Forb	112	168	224
Shrub/Vine	112	146	179
Tree	—	22	45
<b>Total</b>	<b>2242</b>	<b>3699</b>	<b>4483</b>

**Table 6. Ground cover**

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	0-1%
Grass/grasslike foliar cover	70-90%
Forb foliar cover	5-10%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-25%
Surface fragments >0.25" and <=3"	0-4%
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%	5-10%
>0.15 <= 0.3	0-1%	0-1%	10-40%	5-10%
>0.3 <= 0.6	0-1%	0-1%	40-100%	5-10%
>0.6 <= 1.4	0-1%	—	30-70%	—
>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) develops because of continued heavy grazing, an absence of the historic fire regime, and lack of brush management. The grass community in this phase is less productive and has less litter than the Mid/Shortgrass Prairie (1.1). Shortgrasses are very common and bare ground will increase and vary depending on grazing use and rainfall. The ability to support the historic fire regime is diminished and the shrub community will begin to increase over time. This plant community phase can quickly transition from a grass-dominated community to a shrub community if conditions do not favor herbaceous production. When this site occurs on water shedding positions the plant community will look similar to the Tight Sandy Loam ecological site because the soil surface can form a crust and runoff increases. In this phase, reduced rainfall and prolonged droughts will begin to have more of an impact on plant production. As midgrasses decrease, shortgrasses such as red grama, Hall's panicum (*Panicum hallii*), and perennial threeawns increase. Annual and perennial forbs often increase as a result of decreased competition for sunlight and moisture. This phase will quickly transition to the Tree/Shrubland Complex (2) if herbaceous plant production does not increase and shrub density grows.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1513	2270	3026
Shrub/Vine	504	785	1065
Forb	168	224	280
Tree	56	84	112
<b>Total</b>	<b>2241</b>	<b>3363</b>	<b>4483</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 midgrasses that dominate the landscape are highly preferred by livestock and are easily eliminated from the plant community with heavy continuous grazing. Once shortgrass species begin to dominate the herbaceous community, environmental factors like an increase in bare ground and water runoff will begin to favor the invasion of woody species. The historic fire regime has also been changed so that intermittent fires every three to eight 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 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. Mechanical or chemical brush management is also feasible and relatively economical because this community has less than a 20 percent shrub canopy. 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

- honey mesquite (*Prosopis glandulosa*), shrub
- catclaw acacia (*Acacia greggii*), shrub
- spiny hackberry (*Celtis ehrenbergiana*), shrub

## Community 2.1

### Mesquite Prairie

A threshold has been crossed between the Grassland State (1) and the Tree/Shrubland Complex (2). This Mesquite 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 also hasten this process. The shift from the Grassland Community (1) to the Mesquite Prairie Community (2.1) can happen within a period of 5 to 10 years under certain conditions. Mesquite will be the first woody species to invade this site, but other woody species, such as granjeno and lime pricklyash, will occur as part of the plant community. The woody species will begin to form mottes which will grow in size and density. In this state the herbaceous plant community is quickly becoming less productive and as a result bare ground increases. This can become a problem the soil surface begins to crust and creates conditions that are not conducive to grass or forb germination. Unpalatable perennial forbs like dogweed (*Thymophylla penchaeta*) and false broomweed will invade. During rainfall events, more water will runoff of the site depending on its landscape position and slope, instead of entering the soil and becoming available to the plants. This will favor the shrubby species and break the water and nutrient cycles that promote herbaceous production.

Table 9. Annual production by plant type



Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1121	1681	2242
Shrub/Vine	897	1345	1793
Tree	112	168	224
Forb	112	168	224
<b>Total</b>	<b>2242</b>	<b>3362</b>	<b>4483</b>

Figure 13. Plant community growth curve (percent production by month).  
TX5130, Short/Midgrass Shrubland Complex 20-50% woody canopy.  
Shrubland Community with 20-50% woody canopy..

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

## Community 2.2

### Mixed Brush Shrubland

Over time, with continued heavy grazing, no fire, and no brush management the Sandy Loam ecological site will be transformed into a Mixed Brush Shrubland Complex (2.2) with canopies from 50 to 100 percent. Average canopy height in this state ranges from 10 to 20 feet with motte size and spacing varying from less than 2 feet to more than 30 feet depending on the age of the shrub community and the strength of the herbaceous plants. Shrub species like lotebush (*Ziziphus obtusifolia*), desert yaupon, agarito (*Mahonia trifoliolata*), and armagosa (*Castela erecta*) will increase and can create dense shrub mottes with very little understory herbaceous production. Extended droughts will hasten this process. In this state, grass production is severely limited, and no amount of deferred grazing will restore the plant community to the Grassland state. The herbaceous production is dominated by threeawn species, Hall's panicum, red grama (*Bouteloua trifida*), and annual forbs and grasses. The same grass species present in the Grassland state (1) can be found in this community phase, but they will be much less productive and more infrequent. Livestock management also becomes problematic in this plant community because of drastically reduced grass production.

Table 10. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	1177	1905	2634
Tree	448	673	897
Grass/Grasslike	560	701	841
Forb	56	84	112
<b>Total</b>	<b>2241</b>	<b>3363</b>	<b>4484</b>

Figure 15. 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

## Pathway 2.1A

### Community 2.1 to 2.2

Without diligent brush management along with prescribed grazing and other conservation practices this phase will inevitably transition from a Mesquite Prairie Community (2.1) to a Mixed Brush Shrubland Complex (2.2). This transition can happen within a 10-year period and is based on an increase of woody canopy cover to more than 50 percent and a severe decrease in herbaceous plant production. An increase in shrub diversity will also occur.

Shortgrasses and forbs will dominate the herbaceous vegetation and while this transition may be desirable for some wildlife, it will be detrimental for a cattle or livestock operation.

Pathway 2.2A  
Community 2.2 to 2.1

Major inputs, both chemical and mechanical, are often required to restore this community to the Mesquite Prairie Community (2.1). Often with this community, mechanical means such as root plowing and raking are utilized along with dozing and grubbing to create a mosaic of brush mottes that allow herbaceous plants to thrive. Species like mesquite and huisache will re-sprout if not removed completely from the ground. 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. Follow-up conservation practices such as Individual Plant Treatment (IPT) 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.

State 3  
Converted Land

Dominant plant species

- buffelgrass (*Pennisetum ciliare*), grass

Community 3.1  
Planted Pasture/Cropland

To go from the Mixed Brush Shrubland Complex (2.2) to the Converted Land State, (3) mechanical brush management must be applied. Typically, rootplowing and raking are utilized to remove the woody vegetation. A seedbed is then prepared, and the area is planted into grass or crops. Typical crops planted on this site include small grains, oats, or feed grains like sorghum and hay grazer. If introduced species are planted with the addition of moderate to high rates of commercial fertilizer this site can be productive. Because these soils are productive, this site has historically been planted to buffelgrass or introduced bluestems. Inputs such as fertilizer, herbicide, and adequate precipitation or irrigation 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 invade as soon as the pasture is established. Not only is there a long-lived seed source of mesquite, huisache, and other woody species, additional seed are brought in by grazing animals and domestic livestock.

Table 11. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2242	3363	4483
Total	2242	3363	4483

Figure 17. 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 cropped and left to fallow without management inputs. It can also develop after a mechanical brush management practice has been applied during poor weather conditions or not followed up with appropriate management practices. It is typified by the dominance of woody species, very little

herbaceous grass production, high amounts of annual forbs and grasses, and large areas covered by tree-leaf litter, bare ground, and low plant diversity. Because of the seed bank present in the soil and the constant addition of new seed from grazing/browsing animals and seed eating birds, re-infestation of woody seedlings happens in a relatively short time period of two to five years. Typically, pastureland will transition to the Mesquite Prairie Community (2.1) and not to Go Back Land (3.2).

**Figure 18. 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/Cropland (3.1) to Go Back Land (3.2) can occur when crop fields are left to fallow without management. Generally, pasture will transition to the Tree/Shrubland Complex (2) and not to the Go Back Land plant community.

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

Many land managers may want to utilize this site as cropland or pastureland. To achieve this transition land clearing practices such as dozing and raking will be necessary. After the land has been cleared and an appropriate seedbed prepared, the crop or 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 5 to 10 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. This will create a more favorable environment with bare ground and open spaces for woody plants to germinate and grow. If the woody component is not managed it will begin to dominate the landscape and out-compete grasses and forbs for water, sunlight, and other resources.

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

Land managers may want to utilize this site as cropland or pastureland. To achieve this transition from the Grassland State (1), brush management and heavy disking with a Rhome disk, or other heavy implement, will be necessary to incorporate the vegetation into the soil. Prescribed burning can also be used prior to the disking operation to eliminate excessive vegetation. After the land has been cleared and an appropriate seedbed prepared, the crop or pasture can be planted.

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

Major inputs, both chemical and mechanical, are often required to restore the Tree/Shrubland Complex State (2) to the Grassland State (1). The same techniques used to transition to the Mesquite Prairie Community (2.1) are used, but much more brush is typically cleared allowing the majority of the site to revert to a Mid/Shortgrass Prairie Community (1.1). Depending on local conditions, it may also be necessary to prepare an appropriate seedbed and re-introduce a seed source for desired native plant species through range planting.

### **Transition T2A**

## State 2 to 3

Land managers may want to utilize this site as cropland or 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 crop or pasture can be planted.

## Transition T3A

## State 3 to 2

If the Go Back Land Community (3.2) is left alone, eventually the woody plants will create a moderate to heavy canopy. At this point, the desired understory grasses, forbs, and/or crops will be shaded out and the site will transition into a Tree/Shrubland Complex (2).

## 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>			673–1345	
	tanglehead	HECO10	<i>Heteropogon contortus</i>	224–504	–
	false Rhodes grass	TRCR9	<i>Trichloris crinita</i>	224–504	–
	multiflower false Rhodes grass	TRPL3	<i>Trichloris pluriflora</i>	224–504	–
2	<b>Midgrasses</b>			1121–2242	
	silver beardgrass	BOLA2	<i>Bothriochloa laguroides</i>	168–448	–
	hooded windmill grass	CHCU2	<i>Chloris cucullata</i>	168–448	–
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	168–448	–
	pink pappusgrass	PABI2	<i>Pappophorum bicolor</i>	168–448	–
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	168–448	–
3	<b>Shortgrasses</b>			224–448	
	threeawn	ARIST	<i>Aristida</i>	34–84	–
	Texas grama	BORI	<i>Bouteloua rigidiseta</i>	34–84	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	34–84	–
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	34–84	–
	curly-mesquite	HIBE	<i>Hilaria belangeri</i>	34–84	–
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	34–84	–
	lovegrass tridens	TRER	<i>Tridens eragrostoides</i>	34–84	–
	slim tridens	TRMU	<i>Tridens muticus</i>	34–84	–
<b>Forb</b>					
4	<b>Forbs</b>			112–224	
	Forb, annual	2FA	<i>Forb, annual</i>	22–56	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	22–56	–
	Arkansas dozedaisy	APSK	<i>Aphanostephus skirrhobasis</i>	22–56	–
	Illinois bundleflower	DEIL	<i>Desmanthus illinoensis</i>	22–56	–
	bushsunflower	SIMSI	<i>Simsia</i>	22–56	–
	silverleaf nightshade	SOEL	<i>Solanum elaeagnifolium</i>	22–56	–
<b>Shrub/Vine</b>					
5	<b>Shrubs</b>			112–179	

	catclaw acacia	ACGR	<i>Acacia greggii</i>	22–56	–
	spiny hackberry	CEEH	<i>Celtis ehrenbergiana</i>	22–56	–
	Brazilian bluewood	COHO	<i>Condalia hookeri</i>	22–56	–
	Texan hogplum	COTET	<i>Colubrina texensis</i> var. <i>texensis</i>	22–56	–
	Texas lignum-vitae	GUAN	<i>Guaiacum angustifolium</i>	22–56	–
	desert yaupon	SCCU4	<i>Schaefferia cuneifolia</i>	22–56	–
	lime pricklyash	ZAFA	<i>Zanthoxylum fagara</i>	22–56	–
	lotebush	ZIOB	<i>Ziziphus obtusifolia</i>	22–56	–
<b>Tree</b>					
6	<b>Trees</b>			0–45	
	honey mesquite	PRGLG	<i>Prosopis glandulosa</i> var. <i>glandulosa</i>	0–45	–

## 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 (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 (3 to 5 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 flat topography of this site, erosion is minimal, however on more sloping aspects (greater than three percent), erosion may be very significant. This site provides little water for aquifer recharge because when wet, infiltration is very slow.

## **Recreational uses**

Hunting and photography are common activities.

## **Wood products**

In the Grassland State, no wood products are available. In a Shrubland State, the site may produce many large mesquite trees and these are often cut for firewood and barbecue.

## **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.

## **Other references**

AgriLife. 2009. Managing Feral Hogs Not a One-shot Endeavor. AgNews, April 23, 2009.  
<http://agnews.tamu.edu/showstory.php?id=903>.

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

Bestelmeyer, B. T., J.R. Brown, K. M. Havstad, R. Alexander, G. Chavez, and J. E. Herrick. 2003. Development and use of state-and-transition models for rangelands. *Journal of Range Management*, 56(2):114-126.

Briske, B B, B. T. Bestelmeyer, T. K. Stringham, and P. L. Shaver. 2008. Recommendations for development of resilience-based State-and-Transition Models. *Rangeland Ecology and Management*, 61:359-367.

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

Dillehay T. 1974. Late quaternary bison population changes on the Southern Plains. *Plains Anthropologist*, 19:180-96.

Foster, J. H. 1917. Pre-settlement fire frequency regions of the United States: a first approximation. Tall Timbers Fire Ecology Conference Proceedings No. 20.

Frost, C. C. 1995. Presettlement fire regimes in southeastern marshes, peatlands, and swamps. In: Prodeedings, 19th Tall Timbers fire ecology conference, 39-60. Tall Timbers Research Station, Tallahassee, FL.

Fulbright, T. E. and S. L. Beasom. 1987. Long-term effects of mechanical treatment on white-tailed deer browse. *Wildlife Society Bulletin*, 15:560-564.

Hamilton, W. and D. Ueckert. 2005. Rangeland Woody Plant Control: Past, Present, and Future. In: *Brush Management: Past, Present, and Future*, 3-16. Texas A&M University Press. College Station, TX.

Kneuper, C. L., C. B. Scott, and W. E. Pinchak. 2003. Consumption and dispersion of mesquite seeds by ruminants. *Journal of Range Management*, 56:255-259.

Lehman, V. W. 1969. *Forgotten Legions: Sheep in the Rio Grande Plain of Texas*. Texas Western Press, El Paso, TX.

McClendon, T. 1991. Preliminary description of the vegetation of South Texas exclusive of the Coastal Saline

Zones. Texas Journal of Science, 43:13-32.

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

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

Scifres C. J., W. T. Hamilton, J. R. Conner, J. M. Inglis, and G. A. Rasmussen. 1985. Integrated Brush Management Systems for South Texas: Development and Implementation. Texas Agricultural Experiment Station, College Station, TX.

Scifres, C. J. and W. T. Hamilton. 1993. Prescribed burning for brushland management: the South Texas example. Texas A&M Press, College Station, TX.

Smeins, F. E., D. D. Diamond, and W. Hanselka. 1991. Coastal prairie, 269-290. In Ecosystems of the World: Natural Grasslands. Edited by R. T. Coupland. Elsevier Press, Amsterdam, Netherlands.

Snyder, R. A. and C. L. Boss. 2002. Recovery and stability in barrier island plant communities. Journal of Coastal Research, 18:530-536.

Texas Parks and Wildlife Department. 2007. List of White-tailed Deer Browse and Ratings. District 8.

Urbatsch, L. 2000. Chinese tallow tree (*Triadica sebifera* (L.) Small. USDA-NRCS Plant Guide.

Wright, B. D., R. K. Lyons, J. C. Cathey, and S. Cooper. 2002. White-tailed deer browse preferences for South Texas and the Edwards Plateau. Texas Cooperative Extension Bulletin B-6130.

Wright, H.A. and A.W. Bailey. 1982. Fire Ecology: United States and Southern Canada. John Wiley & Sons, Inc., Hoboken, NJ.

## **Contributors**

Gary Harris, MSSSL, NRCS, Robstown, Texas.

## **Approval**

Bryan Christensen, 9/21/2023

## **Acknowledgments**

Technical reviewers and contributors include:

Clark Harshbarger, RSS, NRCS, Robstown

Vivian Garcia, RMS, NRCS, Corpus Christi

Shanna Dunn, RSS, NRCS, Corpus Christi

Jason Hohlt, RMS, NRCS, Kingsville

Tyson Hart, RMS, NRCS, Nacogdoches

Michael Margo, RMS, NRCS, Marfa

## **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)	David Hinojosa, RMS, NRCS, Robstown, TX Jason Hohlt, RMS, NRCS, Kingsville, TX
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 following intense rainfall events.  

---
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 bareground.  

---
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 5 to 14 inches thick with colors ranging from very dark grayish brown to brown with subangular blocky structure. Soil organic matter 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 5% 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:

---

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

---

14. **Average percent litter cover (%) and depth ( in):** 5 to 20 percent litter cover.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 2,000 to 5,500 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:** Mesquite, Old World bluestems, and buffelgrass.

---

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

---