USDA Natural Resources Conservation Service

Ecological site R083BY004TX
Shallow Sandy Loam

Last updated: 9/19/2023
Accessed: 04/23/2024

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.

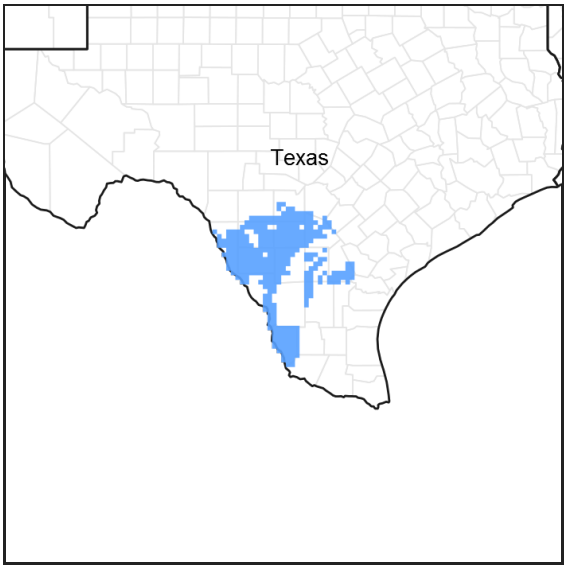


Figure 1. Mapped extent

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): 083B–Western Rio Grande Plain

Major Land Resource Area (MLRA) 83B It makes up about 9,285 square miles (24,060 square kilometers). The border towns of Del Rio, Eagle Pass, Laredo, and Zapata are in this MLRA. Interstate 35 crosses the area just north of Laredo. The Amistad National Recreation Area is just outside this MLRA, northwest of Del Rio, and the Falcon State Recreation Area is southeast of Laredo. Laughlin Air Force Base is just east of Del Rio. This area is comprised of inland, dissected coastal plains.

Classification relationships

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

Ecological site concept

The Shallow Sandy Loam has soils that are shallow to very shallow, gently sloping, with neutral to moderate alkalinity. The reference plant community is a grassland with some woody species.

Associated sites

R083BY003TX	**Gravelly Ridge**
R083BY019TX	**Gray Sandy Loam**
R083BY025TX	**Clay Loam**
R083BY001TX	**Igneous Hill**

Similar sites

R083AY004TX	**Shallow Sandy Loam**
R083CY004TX	**Shallow Sandy Loam**
R083DY004TX	**Shallow Sandy Loam**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Acacia rigidula* (2) *Yucca torreyi*
Herbaceous	(1) *Bothriochloa longipaniculata* (2) *Panicum hallii*

Physiographic features

The site is found on summit and shoulder slopes of ridges on the Coastal Plains. The soils formed in loamy residuum derived from interbedded sandstone of Tertiary age. Slopes are nearly level to gently sloping. Elevation ranges from 200 to 900 feet. This area is comprised of inland, dissected coastal plains.

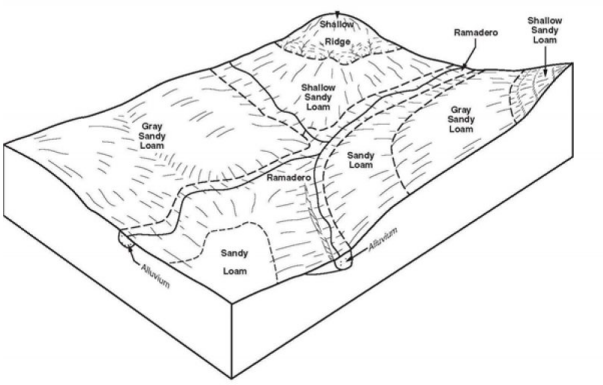


Figure 2.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Ridge
Runoff class	Low to medium
Elevation	200–900 ft
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83B mainly has a subtropical steppe climate along the Rio Grande River and subtropical subhumid climates in La Salle and McMullen counties. Winters are dry and mild and the summers are hot. 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. Most heavy thunderstorm activities occur during the summer months. 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 as the storms dissipate. 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)	231-321 days
Freeze-free period (characteristic range)	313-365 days
Precipitation total (characteristic range)	20 in
Frost-free period (actual range)	214-365 days
Freeze-free period (actual range)	260-365 days
Precipitation total (actual range)	19-21 in
Frost-free period (average)	270 days
Freeze-free period (average)	340 days
Precipitation total (average)	20 in

Climate stations used

- (1) CATARINA [USC00411528], Asherton, TX
- (2) DEL RIO 2 NW [USC00412361], Del Rio, TX
- (3) EAGLE PASS 3N [USC00412679], Eagle Pass, TX
- (4) CRYSTAL CITY [USC00412160], Crystal City, TX
- (5) ZAPATA 1 S [USC00419976], Zapata, TX
- (6) DEL RIO INTL AP [USW00022010], Del Rio, TX
- (7) FALCON DAM [USC00413060], Roma, TX
- (8) LAREDO 2 [USC00415060], Laredo, TX

Influencing water features

Water features do not influence this site.

Wetland description

N/A

Soil features

The soils are shallow to very shallow, well drained, and slowly permeable to impermeable over a paralithic horizon. The pH is neutral to moderate alkaline. The surface texture is fine sandy loam. The surface matrix is very slight to strongly effervescent. Soil series correlated to this site include: Dilley, Lacoste, Randado, and Verick.

Table 4. Representative soil features

Parent material	(1) Residuum–sedimentary rock
Surface texture	(1) Fine sandy loam
Family particle size	(1) Loamy

Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	8–20 in
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	0–8%
Available water capacity (0-20in)	1–2 in
Calcium carbonate equivalent (0-20in)	0–30%
Electrical conductivity (0-20in)	0–2 mmhos/cm
Sodium adsorption ratio (0-20in)	0–2
Soil reaction (1:1 water) (0-20in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–12%
Subsurface fragment volume >3" (Depth not specified)	0–4%

Ecological dynamics

The accounts of early explorers and settlers suggest that the Rio Grande Plains was likely a vast mosaic of open grassland, savannah, and shrubland. While moving in 1691 out of Maverick County and into Zavala County, Don Domingo de Teran found after crossing the Nueces River “the country was level and covered with mesquites and cats’ claw.” In 1849, Michler described south Texas as “concerning the land both on the Frio and the Leona, from these rivers back, that it may be divided into four parallel strips-the first, next to the river, consisting of heavy timber, and a heavy black soil, the second, a mesquite flat, of small width, and the soil of a lighter nature, and very fertile; the third, a range of low hills, covered with loose stones, and thick chaparral; the fourth, a wide-open prairie.” Lehman indicates, “thus while it is quite true that the Rio Grande Plains once had fewer woody plants and more grass than now, it is also true that an ample seed stock of shrubs and trees has been widely distributed for as long as man has known.” The vegetation structure likely varied from place-to-place depending on topography, soil properties, and time since the last major disturbance.

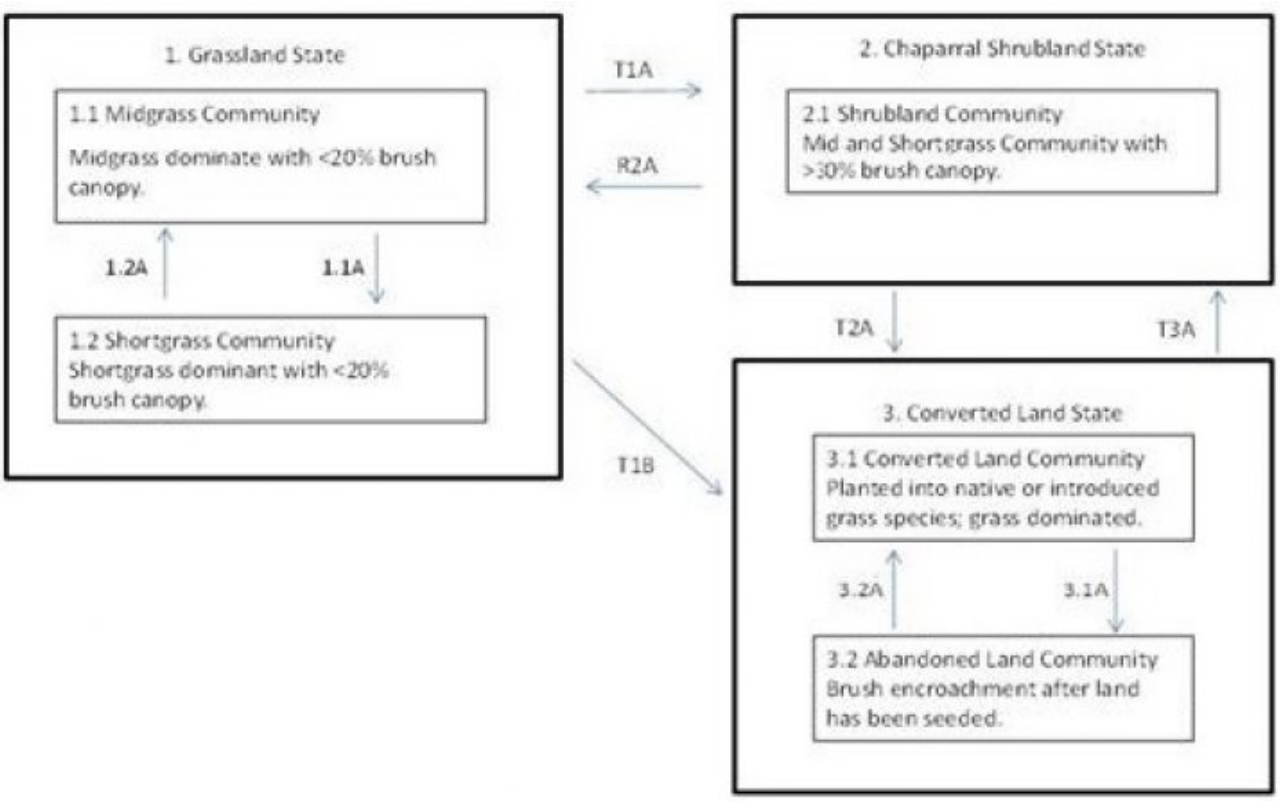
Large numbers of domestic livestock grazed South Texas as early as the mid-1700’s. Formal deeds to properties from the Spanish and Mexican governments came in the late 1760’s with much larger blocks granted in the decades to follow. Lehman indicated, “in 1757, the official Spanish census showed residents of Camargo and Reynosa in the lower Rio Grande owning over 90,000 sheep and goats. By way of contrast, combined numbers of cattle, oxen, horses, mules and burros were less than 16,000.” By the mid-1800’s, according to Lehman’s figures from the U. S. Census of 1889, “there were a minimum of 1,644,268 sheep-fully 45 percent of Texas total population, grazing south of the Nueces River.” According to Inglis, “the Rio Grande Plains had the four-leading sheep producing counties in the state and ten of the top fifteen sheep producing counties were in South Texas. The peak decade was 1880 to 1890, at times exceeding two million head.” These domestic animals were in addition to bison, antelope, deer, and large herds of wild horses. It is obvious from early accounts, that much of the Rio Grande Plains was periodically grazed hard by both domestic animals and wild populations as early as the early to mid-1700’s. It may be that overgrazing by sheep and goats could have suppressed the many shrubs, reduced shrub canopy, and arrested shrub seedlings.

With the arrival of European man, the South Texas area was fenced and, in many instances, stocked beyond its capability to sustain forage. This overstocking led to a reduced fire frequency and intensity, creating an opportunity for woody shrubs to increase across the landscape. As the natural graze-rest cycles were altered and stocking rates continued to exceed the natural carrying capacity of the land, midgrasses were replaced by shortgrasses and the ground cover was opened so additional annual and perennial forbs also increased. Drought certainly enhanced this effect. As prolonged overgrazing continued, shrub cover increased. Shortgrasses became dominant and forage

production decreased. This change in plant cover and structure further decreased fire frequency and intensity, favoring shrub establishment and dominance.

The plant communities of this site are dynamic varying in relation to fire, periodic drought, and wet cycles. Periodic fires were set by either Native Americans or started naturally by lightning. Fire did not play as important a role on this site as in deeper more productive sites due to lower production of grasses to burn. Because of large amounts of gravel in the soil, available water holding capacity is greatly reduced. This causes highly variable forage production and minimal grass production during dry years. The historic community of this site was influenced to some extent by periodic grazing by herds of buffalo and wild horses. Herds of buffalo and wild horses would come into an area, graze it down, and then not come back for many months or even years depending upon the availability of water. This long deferment period allowed recovery of the grasses and forbs which served as fuel load. More than likely, fire occurred following years of good rainfall followed by a dry season. The fire frequency for this area is interpreted to be four to six years (Frost, 1998).

State and transition model



Legend

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

Figure 9. STM

State 1
Grassland

The Grassland State consists of approximately 65 to 85 percent grasses, 10 to 30 percent woody plants, and 5 to 15 percent forbs by air-dry weight. For interpretive purposes, the woody crown canopy can be approximately 20 percent. Two community phases exist, the Midgrass Community and the Shortgrass Community.

Dominant plant species

- tanglehead (*Heteropogon contortus*), grass
- pink pappusgrass (*Pappophorum bicolor*), grass

Community 1.1
Midgrass

The reference community consists of approximately 80 percent grasses, 10 percent woody plants, and 10 percent forbs. Dominant grasses are midgrasses, including tanglehead (*Heteropogon contortus*), pink pappusgrass (*Pappophorum bicolor*), whiplash pappusgrass (*Pappophorum vaginatum*), hooded windmillgrass (*Chloris cucullata*), cane bluestem (*Bothriochloa barbinodis*), silver bluestem (*Bothriochloa saccharoides*), longspike beardgrass (*Bothriochloa longipaniculata*), Arizona cottontop (*Digitaria californica*), slender grama (*Bouteloua repens*), hairy grama (*Bouteloua hirsuta*), and plains bristlegrass (*Setaria vulpiseta*). Shortgrasses include hooded windmillgrass, lovegrass tridens (*Tridens eragrostoides*), and curly mesquite. Bush sunflower (*Simsia calva*), orange zexmenia (Wedelia texana), and western ragweed (ambrosia psilostachya) were present in lesser amounts. Woody shrubs common to the site are guajillo (acacia berlandieri), blackbrush (*Acacia rigidula*), spiny hackberry (*Celtis ehrenbergiana*), condalia (*Ziziphus obtusifolia*), and cenizo (*Leucophyllum frutescens*). This community is maintained by periodic grazing and fire, both natural and anthropogenic. The site is productive and maintains a high percentage of ground cover most of the time. During extended droughts, this ground cover of perennial grasses and forbs is often reduced but has the resiliency to recover when favorable climatic conditions return. Runoff of rainfall is medium with good ground cover, but can be quite high following episodic grazing events, fire, or extended drought. The soils of this site are capable of capping when denuded and this condition sheds most of the rainfall. While periodic grazing was a natural component of the ecosystem, overstocking and continuous overgrazing has a strong impact on this site. Because of overgrazing, the midgrasses tend to decrease and are replaced by less palatable species. Slim tridens (*Tridens muticus*), red grama (*Bouteloua trifida*), hairy grama (*Bouteloua hirsuta*), tumble lovegrass, Texas tridens (*Tridens texanus*), and threeawn (*Aristida purpurea*) are major increasers. Because this site is marginal for burning, heavy grazing removes what little fuels could support regular fires.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1000	1750	2500
Shrub/Vine	150	200	300
Forb	50	100	150
Total	**1200**	**2050**	**2950**

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	1-5%
Grass/grasslike foliar cover	75-85%
Forb foliar cover	5-10%
Non-vascular plants	0%
Biological crusts	0%
Litter	30-60%
Surface fragments >0.25" and <=3"	0%

Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0-10%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	0-1%	0-5%	15-30%	0-5%
>0.5 <= 1	0-1%	2-5%	20-35%	5-10%
>1 <= 2	0-1%	5-10%	40-90%	10-15%
>2 <= 4.5	0-1%	5-10%	10-20%	–
>4.5 <= 13	0-1%	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 11. 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

Figure 12. 1.2 Shortgrass Community

This phase (1.2) of the Grassland State still exhibits a grassland plant structure with a shift to weaker, less palatable shortgrasses. Heavy continuous grazing removes many of the midgrasses from the community. Annual and perennial forbs are more common as weaker plants give way to more bare ground. With continued grazing pressure, increaser grasses become more common across the site. Plant production becomes more erratic. Drought interacts with grazing to trigger mid-to-shortgrass transitions. Termite activity often increases during low rainfall periods to further decrease production and ground cover. Major shrub species include tasajillo (*Cylindropuntia leptocaulis*), blackbrush, twisted acacia (*Acacia tortuosa*), prickly pear (Opuntia spp.), mesquite (prosopis glandulosa), hogplum (*Colubrina texensis*), guayacan (*Guaiacum angustifolium*), and shrubby blue sage (*Salvia ballotiflora*), with a canopy not exceeding 20 percent. The herbaceous community is generally composed of slim tridens, red grama, threeawn species, and other short grasses. The forb community is composed of orange

zexmenia, false ragweed (*Parthenium hysterophorus*), dogweed (Dyssodia spp.), palofoxia (Palofoxia spp.), and many annuals. The shortgrass and forb communities are less productive than the midgrass communities they replace. Reductions in above-ground cover and root biomass make this community more prone to runoff, erosion, and prolong the effects of drought. A reduction in ground cover leads to higher soil temperatures that, in conjunction with the reduction of leaf and root biomass inputs, can cause declines in soil organic matter. This reduces soil water holding capacity and fertility that further affects species composition and production. Fire frequency and intensity in this community is low because of low fine fuel load and continuity. As a result, woody plants are free to increase in size, density, and total cover. When removing grazing pressure, midgrasses can regain dominance on the site and undesirable trends in soil organic matter, fertility, temperature, and erosion can be arrested and reversed. However, this process is very difficult to predict. Restoration of fine fuel biomass and continuity enable use of prescribed fire to reduce the stature and cover of established woody plants. The extent to which the original midgrass community can be re-established will depend on the extent to which soil physical and chemical properties were altered during retrogression.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1000	1750	2500
Forb	50	150	250
Shrub/Vine	100	150	200
Tree	10	25	40
Total	**1160**	**2075**	**2990**

Figure 14. 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

A shift to the Shortgrass Community occurs if the Midgrass Community is weakened by excessive leaf removal. Drought hastens the process. A reduction in midgrass also corresponds in a reduction of fuel loading needed for fire to effectively suppress woody species.

Pathway 1.2A
Community 1.2 to 1.1

Managerial activities that restore the hydrologic cycle, the energy capture by midgrasses, and the restoring ground cover will move the Shortgrass Community (1.2) toward the Midgrass Community (1.1). Utilizing historic ecological disturbances such as herbivory, selective brush management, and fire in constructive amounts can benefit the site. The time to shift back to the Midgrass Community (1.1) is dependent upon favorable growing conditions and could take 5 to 10 years.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

State 2
Chaparral Shrubland

The Chaparral Shrubland State consists of the Shrubland Community. This is a midgrass and shortgrass community with a shrub canopy of mixed brush.

Dominant plant species

- Christmas cactus (*Cylindropuntia leptocaulis*), shrub
- blackbrush (*Coleogyne ramosissima*), shrub

Community 2.1
Shrubland

Figure 15. 2.1 Shrubland Community

Lack of fire and continued heavy grazing causes a shift to shrublands with greater than 30 percent brush cover. Major shrub species include tasajillo, blackbrush, twisted acacia, prickly pear, mesquite, hogplum, guayacan, shrubby blue sage, and a whole suite of others. The herbaceous community is generally composed of slim tridens, red grama, threeawn species, and other short grasses. The forb community is composed of orange zexmenia, false ragweed, dogweed, palofoxia, and many annuals. At this point, prescribed grazing alone will not restore this community back to the Grassland State (1). During the growing season, light showers are captured in the canopy of the shrubs and evaporate before reaching the soil surface. Energy flow and nutrient use is predominately through the shrubs. Annual forbs can be produced by rainfall at any time of the year. With these conditions, prescribed fire is a very limited option because of a lack of fine fuel load. Without brush management and with continued heavy grazing, woody cover will increase to more than 50 percent canopy. Aggressive brush and grazing management is required to convert the system back to the grassland state. Re-seeding of perennial warm-season grasses may be necessary if the herbaceous component is dominated by shortgrasses and annual forbs.

Table 9. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	150	475	800
Shrub/Vine	350	450	550
Forb	50	100	150
Total	**550**	**1025**	**1500**

Figure 17. 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

State 3
Converted Land

The Converted Land State is the result of mechanical intervention along with range planting to either native or adapted introduced species.

Dominant plant species

- buffelgrass (*Pennisetum ciliare*), grass

Community 3.1
Converted Land

This plant community is developed by applying brush management and seeding. The conversion can actually come from any of the previously mentioned communities where brush needs to be reduced and a seed source added to establish a desired plant community. In some instances, an adequate seed source may already exist in the soil. When rootplowing is applied as brush management on this site, long term forb and woody plant diversity will be greatly reduced. Previous attempts at native seeding in this region were met with mixed results because of the seed source not being locally adapted to the region. Many of the grass species listed in the reference plant community are commercially available from collections made in south Texas. The locally adapted species are expected to be more successful in seeding efforts as compared to seed developed several hundred miles outside the region. However, proper seedbed preparation, planting techniques, and timely rainfall are essential for success. The most common introduced grass species seeded is buffelgrass (Cenchrus ciliare). Seeding this species should be cautiously considered due to its aggressive nature to dominate plant communities and reduce herbaceous diversity. Once planted, conversion of buffelgrass dominated areas back to native grass is extremely difficult and rarely successful. The decision of which species to seed is a management decision based on clearly defined goals for livestock and wildlife. Careful consideration should be taken prior to seeding introduced species. Once introduced species are seeded, it is often difficult or impractical to remove them should objectives change. Because of the residual seed source of woody plants, encroachment is inevitable. To help maintain this plant community, prescribed grazing along with fire and some integrated brush management will be needed.

Table 10. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1000	2000	3000
Shrub/Vine	100	200	300
Forb	50	100	150
Total	**1150**	**2300**	**3450**

Figure 19. Plant community growth curve (percent production by month). TX5133, Converted Land Community - Native Grass Seeding. Developed by applying brush management, land clearing and seeding to any of the other plant communities where brush needs to be reduced and a seed source added to establish the desired plant community. .

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 3.2
Abandoned Land

This community develops from the Converted Land Community (3.1) through neglect or abandonment. Without follow-up brush management, seedlings of shrubs establish and spread. Mesquite, twisted acacia, and pricklypear are the most common woody plants or shrubs found on this site following rootplowing. Maintaining healthy grass cover on the site through prescribed grazing might slow brush seedling encroachment however, brush encroachment at some rate is inevitable. If the seedlings are not managed, the plant community will cross a threshold to the Shrubland State (2) which will require application of chemical or mechanical brush management to reduce the canopy. If left untreated too long, reseeding might be needed to restore the grass. As the canopy of the shrubs expands, grass and forb production will be reduced.

Table 11. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	700	1250	1800
Shrub/Vine	150	250	350
Forb	50	100	150
Total	**900**	**1600**	**2300**

Figure 21. Plant community growth curve (percent production by month). TX5138, Converted Land Community - Woody Seedling Encroachment. Abandoned croplands and land seeded with exotic or native grasses are prone to encroachment by woody plants and with heavy grazing or the absence of fire, can revert to shrublands..

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

A shift to the Abandoned Land Community occurs when no management activities such as prescribed grazing, brush management, or fire are accomplished as brush invades. Drought worsens the process. A reduction in planted grasses also corresponds in a reduction of fuel loading needed for fire to effectively suppress woody species.

Pathway 3.2A
Community 3.2 to 3.1

Brush management along with prescribed grazing can recover the Converted Land Community. Some replanting may be needed and can be done in conjunction with brush management.

Conservation practices

Brush Management
Prescribed Burning
Range Planting
Prescribed Grazing

Transition T1A
State 1 to 2

The Grassland State will cross a threshold to State 2 Chaparral Shrubland with heavy continuous grazing, no brush management, and subsequently no fire. Severe drought is also a significant factor to accelerate this crossing of a threshold. In State 2 more rainfall is being utilized by woody plants. Because of the increased canopy, sunlight is being captured by the woody plant and converted to energy limiting the growth of the herbaceous plants.

Transition T1B
State 1 to 3

The transition to the Converted Land State is triggered by major ground disturbing mechanical treatment and planting to native or introduced forages (usually following brush management).

Restoration pathway R2A
State 2 to 1

If the management goal is to restore to State 1, significant inputs of energy will be needed. An integrated approach to Brush Management (Scifres, et al., 1985) with mechanical treatment, herbicides, and fire will initially reduce the woody species providing opportunity for at least partial recovery of the hydrologic cycle and the energy cycle. Seeding may be needed and can be done in conjunction with ground disturbance methods of brush management.

Transition T2A
State 2 to 3

The transition to the Converted Land State is triggered by major ground disturbing mechanical treatment and planting to native or introduced forages. Planting is usually done following brush management.

Transition T3A
State 3 to 2

The transition from the Converted Land State to the Chaparral Shrubland State is triggered by neglect or no management over long periods time.

Additional community tables

Table 12. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Bunchgrasses**			800–2000	
	tanglehead	HECO10	*Heteropogon contortus*	100–800	–
	pink pappusgrass	PABI2	*Pappophorum bicolor*	100–600	–
	Texas bristlegrass	SETE6	*Setaria texana*	100–400	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	100–400	–
	longspike beardgrass	BOLO	*Bothriochloa longipaniculata*	100–400	–
	slender grama	BORE2	*Bouteloua repens*	100–400	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	100–400	–
2	**Short grasses**			200–500	
	Hall's panicgrass	PAHA	*Panicum hallii*	50–200	–
	slim tridens	TRMU	*Tridens muticus*	50–150	–
	red grama	BOTR2	*Bouteloua trifida*	50–150	–
	tumble windmill grass	CHVE2	*Chloris verticillata*	0–100	–
	tumble lovegrass	ERSE2	*Eragrostis sessilispica*	0–100	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	10–100	–
	Texas fluffgrass	TRTE2	*Tridens texanus*	10–100	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	10–100	–
	thin paspalum	PASE5	*Paspalum setaceum*	50–100	–
Forb					
3	**Forbs**			50–150	
	fleshy honeysweet	TICA2	*Tidestromia carnosa*	25–75	–
	Lindheimer's hoarypea	TELI	*Tephrosia lindheimeri*	10–50	–
	croton	CROTO	*Croton*	10–50	–
	dutchman's breeches	DICU	*Dicentra cucullaria*	10–50	–
	bladderpod	LESQU	*Lesquerella*	10–50	–
	Mexican oregano	LIGR6	*Lippia graveolens*	10–50	–

	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	10–50	–
	Gray's feverfew	PACO11	*Parthenium confertum*	10–50	–
	palafox	PALAF	*Palafoxia*	10–50	–
	California plantain	PLHO	*Plantago hookeriana*	10–50	–
	pricklyleaf dogweed	THAC	*Thymophylla acerosa*	10–50	–
	paperflower	PSILO3	*Psilostrophe*	0–25	–
	Indian blanket	GAPU	*Gaillardia pulchella*	10–25	–
	plains dozedaisy	APRA	*Aphanostephus ramosissimus*	0–25	–
	winecup	CADI2	*Callirhoe digitata*	0–10	–
	evening rainlily	CODR2	*Cooperia drummondii*	0–10	–
	beeblossom	GAURA	*Gaura*	0–10	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–10	–
	stemless evening primrose	OETR2	*Oenothera triloba*	0–10	–
	flax	LINUM	*Linum*	0–10	–
	fineleaf fournerved daisy	TELI3	*Tetraneuris linearifolia*	0–10	–
Shrub/Vine					
4	**Shrubs/Vines**			150–300	
	Torrey's yucca	YUTO	*Yucca torreyi*	25–100	–
	Texas barometer bush	LEFR3	*Leucophyllum frutescens*	25–100	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	25–100	–
	guajillo	ACBE	*Acacia berlandieri*	25–100	–
	blackbrush acacia	ACRI	*Acacia rigidula*	25–100	–
	Schaffner's wattle	ACSC2	*Acacia schaffneri*	25–100	–
	Rio Grande beebrush	ALMA9	*Aloysia macrostachya*	10–50	–
	Brazilian bluewood	COHO	*Condalia hookeri*	10–50	–
	Texan hogplum	COTE6	*Colubrina texensis*	10–50	–
	jointfir	EPHED	*Ephedra*	10–50	–
	stretchberry	FOPU2	*Forestiera pubescens*	10–50	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	10–50	–
	coyotillo	KAHU	*Karwinskia humboldtiana*	10–50	–
	shrubby blue sage	SABA5	*Salvia ballotiflora*	10–50	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	10–50	–
	pricklypear	OPUNT	*Opuntia*	10–50	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	10–50	–
	Texas kidneywood	EYTE	*Eysenhardtia texana*	0–40	–
	creosote bush	LATR2	*Larrea tridentata*	0–25	–
	leatherstem	JADI	*Jatropha dioica*	0–25	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–25	–

Animal community

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

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

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

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

Tree/Shrubland (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

In the Shrubland Complex (State 2), annual evapotranspiration from shortgrass/forb herbaceous zones were comparable to those from woody plant patches. Surface runoff and deep drainage were only slightly higher in grass dominated patches (Weltz and Blackburn, 1995). Increasing water yield by converting shrub-dominated areas to grass domination is thus marginal and limited to years when winter and spring rainfall is high. There is little evidence that increases in percolation and surface runoff from converted communities could be reliably captured and dependably made available off-site. The main benefit of brush management is to release moisture in the soil profile to be utilized by herbaceous plants.

Recreational uses

Hunting and bird watching 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.

Author(s)/participant(s)	Vivian Garcia, RMS, NRCS, Corpus Christi, Texas
Contact for lead author	361-241-0609, Corpus Christi Zone Office
Date	04/02/2015
Approved by	Bryan Christensen
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:** None, except after heavy rains.

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3. **Number and height of erosional pedestals or terracettes:** Very few.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10 percent.

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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):** Short, less than foot except during overflow events.

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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 Stability Rating of 5.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Subangulary blocky, less than one percent SOM, A-horizon 2 to 9 inches.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Surface runoff is slight and drainage is higher in grass-dominated patches.

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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: Warm season mid grasses>>

    Sub-dominant: warm season short grasses (SD)>>Forbs (SD) Trees (SD)

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Grasses, because of their growth habit will exhibit some mortality and decadence, though very slight.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,000 to 3,000 air-dry pounder per acres.

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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:** Slim tridens, red grama, threeawn, blackbrush acacia, creosote, guajillo, cenizo, ragweed, pear, and hogplum.

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17. **Perennial plant reproductive capability:** All plants should reproduce each year.
