USDA Natural Resources Conservation Service

Ecological site R083AY004TX
Shallow Sandy Loam

Last updated: 9/19/2023
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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 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

R083AY022TX	**Loamy Sand**
R083AY001TX	**Igneous Hill**
R083AY023TX	**Sandy Loam**
R083AY026TX	**Eastern Clay Loam**
R083AY003TX	**Gravelly Ridge**
R083AY005TX	**Shallow**

Similar sites

R083BY004TX	**Shallow Sandy Loam**
R083CY004TX	**Shallow Sandy Loam**
R083DY004TX	**Shallow Sandy Loam**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Yucca torreyi* (2) *Prosopis glandulosa*
Herbaceous	(1) *Heteropogon contortus* (2) *Panicum hallii*

Physiographic features

These nearly level to gently sloping soils are on broad, low ridges on inland, dissected coastal plains. Slope ranges 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 > Hill (3) Coastal plain > Ridge
Runoff class	Medium to very high
Elevation	61–305 m
Slope	0–8%
Aspect	Aspect is not a significant factor

Climatic features

MLRA 83A is subtropical, subhumid on the western boundary and subtropical humid on the eastern boundary. Winters are dry and mild and the summers are hot and humid. Tropical maritime air masses predominate throughout spring, summer, and fall. Modified polar air masses exert considerable influence during winter, creating a continental climate characterized by large variations in temperature. Average precipitation for MLRA 83A is 20 inches on the western boundary and 35 inches on the eastern boundary. Peak rainfall, because of rain showers, occurs late in spring and a secondary peak occurs early in fall. Heavy thunderstorm activities increase in April, May, and June. July is hot and dry with little weather variations. Rainfall increases again in late August and September as tropical disturbances increase and become more frequent. Tropical air masses from the Gulf of Mexico dominate during the spring, summer, and fall. Prevailing winds are southerly to southeasterly throughout the year except in December when winds are predominately northerly.

Table 3. Representative climatic features

Frost-free period (characteristic range)	223-251 days

Freeze-free period (characteristic range)	263-365 days
Precipitation total (characteristic range)	635-813 mm
Frost-free period (actual range)	208-263 days
Freeze-free period (actual range)	254-365 days
Precipitation total (actual range)	610-940 mm
Frost-free period (average)	235 days
Freeze-free period (average)	314 days
Precipitation total (average)	737 mm

Climate stations used

- (1) CARRIZO SPRINGS 3W [USC00411486], Carrizo Springs, TX
- (2) DILLEY [USC00412458], Dilley, TX
- (3) FLORESVILLE [USC00413201], Floresville, TX
- (4) KARNES CITY 2N [USC00414696], Karnes City, TX
- (5) LYTLE 3W [USC00415454], Natalia, TX
- (6) PLEASANTON [USC00417111], Pleasanton, TX
- (7) HONDO MUNI AP [USW00012962], Hondo, TX
- (8) BEEVILLE 5 NE [USC00410639], Beeville, TX
- (9) CUERO [USC00412173], Cuero, TX
- (10) GOLIAD [USC00413618], Goliad, TX
- (11) MATHIS 4 SSW [USC00415661], Mathis, TX
- (12) NIXON [USC00416368], Stockdale, TX
- (13) TILDEN 4 SSE [USC00419031], Tilden, TX
- (14) UVALDE 3 SW [USC00419268], Uvalde, TX
- (15) CROSS [USC00412125], Tilden, TX
- (16) FOWLERTON [USC00413299], Fowlerton, TX
- (17) HONDO [USC00414254], Hondo, TX
- (18) PEARSALL [USC00416879], Pearsall, TX
- (19) POTEET [USC00417215], Poteet, TX
- (20) CHARLOTTE 5 NNW [USC00411663], Charlotte, TX
- (21) CHEAPSIDE [USC00411671], Gonzales, 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 shallow to shallow, well drained, moderately permeable soils that formed in loamy residuum over bedrock. The soil series correlated to this site include: Dilley, Lacoste, and Randado.

Table 4. Representative soil features

Parent material	(1) Alluvium–sedimentary rock
Surface texture	(1) Fine sandy loam (2) Sandy clay loam

Family particle size	(1) Loamy (2) Clayey
Drainage class	Well drained
Permeability class	Moderate
Soil depth	30–46 cm
Surface fragment cover <=3"	0–8%
Surface fragment cover >3"	0–3%
Available water capacity (0-101.6cm)	2.54–7.62 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–12%
Subsurface fragment volume >3" (Depth not specified)	0–3%

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. White-tailed deer, wild turkey, bobwhite quail, and dove are the major wildlife species, and hunting leases are a major source of income for many landowners in this area. Introduced pasture has been established on many acres of old cropland and in areas with deeper soils. Buffelgrass is the most common introduced plant on the site and to a lesser extent Bermudagrass, 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

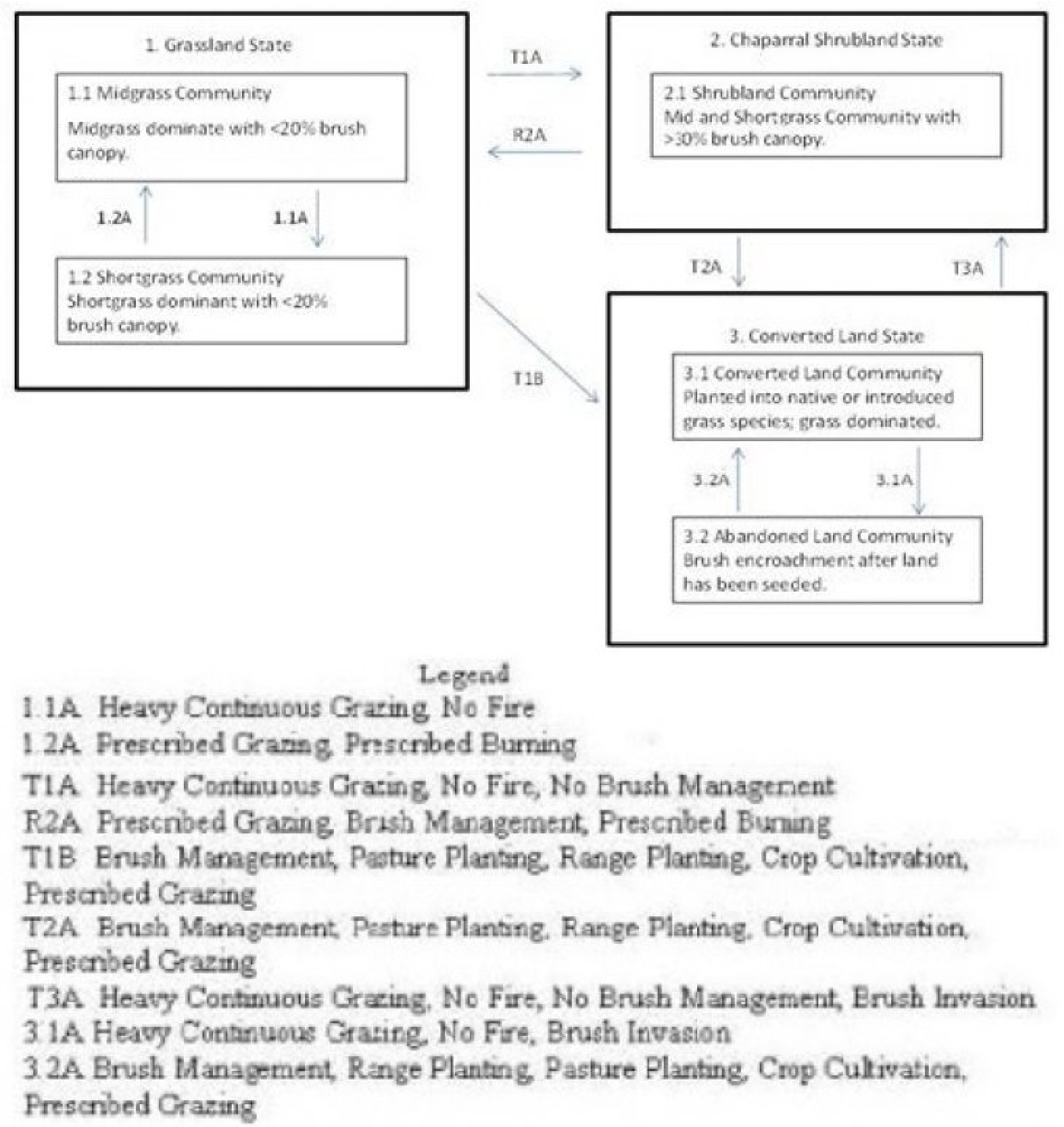

Figure 8. STM

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

- pink pappusgrass (*Pappophorum bicolor*), grass
- tanglehead (*Heteropogon contortus*), 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1121	1961	2802
Shrub/Vine	168	224	336
Forb	56	112	168
Total	**1345**	**2297**	**3306**

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 (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	0-1%	0-5%	15-30%	0-5%
>0.15 <= 0.3	0-1%	2-5%	20-35%	5-10%
>0.3 <= 0.6	0-1%	5-10%	40-90%	10-15%
>0.6 <= 1.4	0-1%	5-10%	10-20%	–
>1.4 <= 4	0-1%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 10. 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

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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1121	1961	2802
Forb	56	168	280
Shrub/Vine	112	168	224
Tree	11	28	45
Total	**1300**	**2325**	**3351**

Figure 12. 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

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

Community 2.1
Shrubland

Lack of fire and continued heavy grazing causes a to shrublands with greater than 30 percent brush cover. Major shrub species include tasajillo, blackbrush, twisted acacia, prickly pear, mesquite, hogplum, guayacan, and shrubby blue sage. 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	168	532	897
Shrub/Vine	392	504	616
Forb	56	112	168
Total	**616**	**1148**	**1681**

Figure 14. 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1121	2242	3363
Shrub/Vine	112	224	336
Forb	56	112	168
Total	**1289**	**2578**	**3867**

Figure 16. 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	785	1401	2018
Shrub/Vine	168	280	392
Forb	56	112	168
Total	**1009**	**1793**	**2578**

Figure 18. 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 mechanical treatment and planting to native or introduced forages. Planting usually follows 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 (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Bunchgrasses**			897–2242	
	tanglehead	HECO10	*Heteropogon contortus*	112–897	–
	pink pappusgrass	PABI2	*Pappophorum bicolor*	112–673	–
	Texas bristlegrass	SETE6	*Setaria texana*	112–448	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	112–448	–

	longspike beardgrass	BOLO	*Bothriochloa longipaniculata*	112–448	–
	slender grama	BORE2	*Bouteloua repens*	112–448	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	112–448	–
2	**Short grasses**			224–560	
	Hall's panicgrass	PAHA	*Panicum hallii*	56–224	–
	red grama	BOTR2	*Bouteloua trifida*	56–168	–
	slim tridens	TRMU	*Tridens muticus*	56–168	–
	Texas fluffgrass	TRTE2	*Tridens texanus*	11–112	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	11–112	–
	tumble windmill grass	CHVE2	*Chloris verticillata*	0–112	–
	tumble lovegrass	ERSE2	*Eragrostis sessilispica*	0–112	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	11–112	–
	thin paspalum	PASE5	*Paspalum setaceum*	56–112	–
Forb					
3	**Forbs**			56–168	
	fleshy honeysweet	TICA2	*Tidestromia carnosa*	28–84	–
	Lindheimer's hoarypea	TELI	*Tephrosia lindheimeri*	11–56	–
	bladderpod	LESQU	*Lesquerella*	11–56	–
	Mexican oregano	LIGR6	*Lippia graveolens*	11–56	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	11–56	–
	Gray's feverfew	PACO11	*Parthenium confertum*	11–56	–
	palafox	PALAF	*Palafoxia*	11–56	–
	California plantain	PLHO	*Plantago hookeriana*	11–56	–
	croton	CROTO	*Croton*	11–56	–
	dutchman's breeches	DICU	*Dicentra cucullaria*	11–56	–
	pricklyleaf dogweed	THAC	*Thymophylla acerosa*	11–56	–
	Indian blanket	GAPU	*Gaillardia pulchella*	11–28	–
	plains dozedaisy	APRA	*Aphanostephus ramosissimus*	0–28	–
	paperflower	PSILO3	*Psilostrophe*	0–28	–
	stemless evening primrose	OETR2	*Oenothera triloba*	0–11	–
	flax	LINUM	*Linum*	0–11	–
	fineleaf fournerved daisy	TELI3	*Tetraneuris linearifolia*	0–11	–
	winecup	CADI2	*Callirhoe digitata*	0–11	–
	beeblossom	GAURA	*Gaura*	0–11	–
	Texas stork's bill	ERTE13	*Erodium texanum*	0–11	–
	evening rainlily	CODR2	*Cooperia drummondii*	0–11	–
Shrub/Vine					
4	**Shrubs/Vines**			168–336	
	Torrey's yucca	YUTO	*Yucca torreyi*	28–112	–
	Texas barometer bush	LEFR3	*Leucophyllum frutescens*	28–112	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	28–112	–
	guajillo	ACBE	*Acacia berlandieri*	28–112	–
	blackbrush acacia	ACRI	*Acacia rigidula*	28–112	–

	Schaffner's wattle	ACSC2	*Acacia schaffneri*	28–112	–
	Rio Grande beebrush	ALMA9	*Aloysia macrostachya*	11–56	–
	Brazilian bluewood	COHO	*Condalia hookeri*	11–56	–
	Texan hogplum	COTE6	*Colubrina texensis*	11–56	–
	shrubby blue sage	SABA5	*Salvia ballotiflora*	11–56	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	11–56	–
	pricklypear	OPUNT	*Opuntia*	11–56	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	11–56	–
	jointfir	EPHED	*Ephedra*	11–56	–
	stretchberry	FOPU2	*Forestiera pubescens*	11–56	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	11–56	–
	coyotillo	KAHU	*Karwinskia humboldtiana*	11–56	–
	Texas kidneywood	EYTE	*Eysenhardtia texana*	0–45	–
	creosote bush	LATR2	*Larrea tridentata*	0–28	–
	leatherstem	JADI	*Jatropha dioica*	0–28	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	0–28	–

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

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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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
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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.

2. **Presence of water flow patterns:** None, except after heavy rains.

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

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

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

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.

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.

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.

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: Warm season mid grasses>>

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

    Other:

    Additional:

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.

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

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.

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.

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