USDA Natural Resources Conservation Service

Ecological site R083BY015TX
Saline Clay

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.

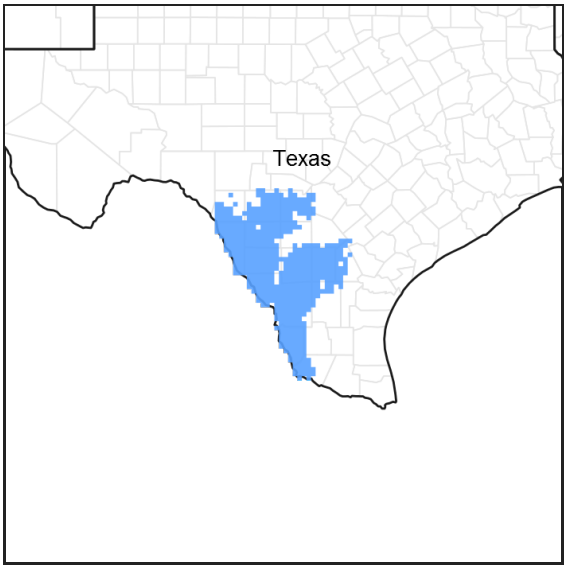


Figure 1. Mapped extent

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): 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 Saline Clay sites are affected by salts in the soil profile. Heavy clays, coupled with salts, create a specialized plant community adapted to this unique environment.

Associated sites

R083BY003TX	**Gravelly Ridge**
R083BY016TX	**Saline Clay Loam**
R083BY025TX	**Clay Loam**
R083BY011TX	**Claypan Prairie**
R083BY012TX	**Ramadero**
R083BY018TX	**Clay Flat**

Similar sites

R083DY015TX	**Saline Clay**

Table 1. Dominant plant species

Tree	(1) *Prosopis glandulosa*
Shrub	(1) *Atriplex canescens* (2) *Celtis ehrenbergiana*
Herbaceous	(1) *Sporobolus wrightii* (2) *Sporobolus airoides*

Physiographic features

These nearly level to gently undulating soils occur on ridges and interfluves on the Coastal Plains. The soils formed in thick beds of calcareous, saline and/or sodic clayey residuum sediments. In places, these sediments are interbedded with shale, siltstone and sandstone. Slope ranges from 0 to 5 percent. Elevation ranges from 200 to 600 feet. This area is comprised of inland, dissected coastal plains.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Ridge (2) Coastal plain > Interfluve
Runoff class	High to very high
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	200–600 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) EAGLE PASS 3N [USC00412679], Eagle Pass, TX
- (2) ZAPATA 1 S [USC00419976], Zapata, TX
- (3) DEL RIO INTL AP [USW00022010], Del Rio, TX
- (4) CATARINA [USC00411528], Asherton, TX
- (5) CRYSTAL CITY [USC00412160], Crystal City, TX
- (6) DEL RIO 2 NW [USC00412361], Del Rio, TX
- (7) FALCON DAM [USC00413060], Roma, TX
- (8) LAREDO 2 [USC00415060], Laredo, TX

Influencing water features

During high intensity rainfalls, lower elevations of this site may flood for brief periods.

Wetland description

N/A.

Soil features

The soils are moderately deep to very deep, moderately well to well drained, very slowly permeable to impermeable, slightly to strongly alkaline affected by salts. Surface color ranges from light brownish gray to brown. Some soils have high shrink-swell and a presence of gypsum. Soil series correlated to this site include: Catarina, Cotulla, Esseville, Lasalle, Maverick, Mercedes, Montell, Veleno, and Viboras.

Table 4. Representative soil features

Parent material	(1) Residuum–mudstone (2) Alluvium–mudstone
Surface texture	(1) Clay
Family particle size	(1) Fine
Drainage class	Moderately well drained to well drained
Permeability class	Very slow to slow
Soil depth	20–80 in
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	2–7 in

Calcium carbonate equivalent (0-40in)	2–20%
Electrical conductivity (10-40in)	4–32 mmhos/cm
Sodium adsorption ratio (0-40in)	0–40
Soil reaction (1:1 water) (0-40in)	7.4–8.9
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–1%

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.

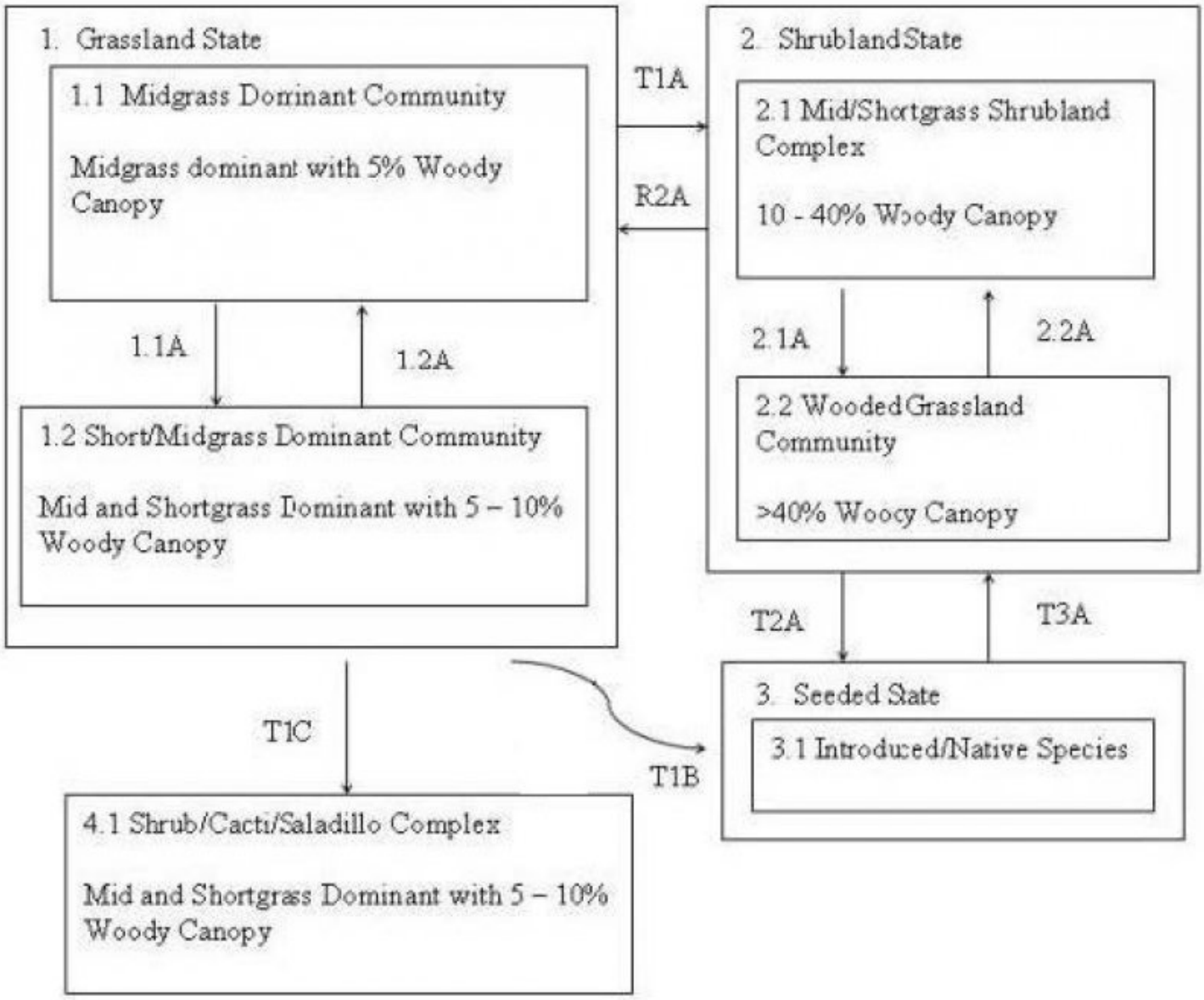
The plant communities of this site are dynamic varying in relation to fire, periodic drought, and wet cycles. Periodic fires were set by either Native Americans or started naturally by lightning. Fire did not play as important a role on this site as in deeper more productive sites due to lower production 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).

The reference plant community is a mosaic of midgrass-dominated grassland with a few trees or shrubs. The one tallgrass component is big sacaton (*Sporobolus wrightii*). This plant, along with alkali sacaton (*Sporobolus airoides*), makes up over 50 percent of the herbaceous production in some landscape settings. Other midgrasses common to this site include false Rhodesgrass (*Trichloris crinita*), silver bluestem (*Bothriochloa laguroides*), plains bristlegrass (*Setaria macrostachya*), Arizona cottontop (*Digitaria californica*), pink pappusgrass (*Pappophorum bicolor*), and Texas bristlegrass (Setaria texanus). Shortgrasses such as curly mesquite (*Hilaria belangeri*) were always a part of this plant community and increased or decreased from year-to-year due to drought, fire, and major episodic grazing events. Other shortgrasses include hooded windmillgrass (*Chloris cucullata*), Hall's panicum (*Panicum hallii*), and whorled dropseed (*Sporobolus pyramidatus*).

Common forbs include erect dayflower (*Commelina erecta*), golden dalea (*Dalea aurea*), hairy tubetongue (*Justicia pilosella*), and sensitive briar (Mimosa spp.). The occasional woody plants present include four-wing salt bush (*Atriplex canescens*), allthorn goatbush (*Koeberlinia spinosa*), lotebush (*Ziziphus obtusifolia*), and spiny hackberry (*Celtis ehrenbergiana*). An occasional stunted honey mesquite (*Prosopis juliflora*) may also be present. The Saline Clay is a droughty site due to salinity and the sodium content in the soil profile. If this site is denuded by grazing, extended long-term drought, or other catastrophic events, the soil will blow or wash away. As a result of herbaceous cover loss, both salinity and sodium content increases in the surface profile. Once in this condition, recovery long-term and slow.

State and transition model



Legend

1.1A – Heavy Continuous Grazing, No Fire, No Brush Management
1.2 A – Prescribed Grazing, Prescribed Burning, Brush Management (Chemical)
2.1A – Heavy Continuous Grazing, No Fire, Brush Invasion
2.2A – Prescribed Grazing, Prescribed Burning, Brush Management (Chemical)
R2A – Brush Management (Chemical), Prescribed Burning, Prescribed Grazing
T3A – Heavy Continuous Grazing, No Fire, Brush Invasion
T1A – Heavy Continuous Grazing, No Fire, Brush Invasion
T1B – Brush Management, Pasture Planting, Range Planting, Prescribed Grazing
T1C – Heavy Continuous Grazing, Soil Disturbance
T2A – Brush Management, Range Planting, Pasture Planting, Prescribed Grazing

Figure 8. STM

State 1
Grassland

Dominant plant species

- big sacaton (*Sporobolus wrightii*), grass

- alkali sacaton (*Sporobolus airoides*), grass

Community 1.1
Midgrass Dominant

The Saline Clay was dominated by midgrasses with a minor component of shortgrasses. Big sacaton and alkali sacaton make up a significant percentage of the herbaceous production. It should be noted that early ranchers and grazers (mid-to-late 1700's) burned this site frequently to remove old stubble and increase the palatability of the midgrasses. In addition to the sacatons, false Rhodesgrass, plains bristlegrass, Arizona cottontop, and silver bluestem were also an important midgrass component. There were some shortgrasses present, but they make up a small percentage of total herbaceous production. There are scattered trees and shrubs like mesquite and pricklypear. This community was maintained by periodic intense fire and grazing by large herbivores. If this site is overgrazed and excessive grazing continues, the midgrass community will be replaced by increased amounts of shortgrasses and more soil will be exposed. Some of the first midgrasses to disappear will be the sacatons, followed by false Rhodesgrass, plains bristlegrass, and Arizona cottontop. Shortgrasses that increase with this grazing pressure include curly mesquite, hooded windmillgrass, and whorled dropseed. If overgrazing continues, red grama, Texas varilla, whorled dropseed, and annuals will dominate the site. Patches of bare ground will begin to appear and grow larger, becoming susceptible to erosion.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1030	2475	3500
Shrub/Vine	50	75	100
Tree	50	75	100
Forb	25	50	75
Total	**1155**	**2675**	**3775**

Figure 10. Plant community growth curve (percent production by month). TX4800, Midgrass Dominant Community. Warm-season midgrasses with forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	2	10	20	20	5	8	15	10	6	2

Community 1.2
Mid/Shortgrass Dominant

This community results from continued heavy grazing over time and results in reduction of the midgrasses and an increase in the volume of shortgrasses. Big and alkali sacaton along with false Rhodesgrass, plains bristlegrass and Arizona cottontop make up significantly less volume of herbaceous production. These are replaced by pink pappusgrass, hooded windmillgrass, curly mesquite, and whorled dropseed.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	900	2000	3000
Shrub/Vine	75	100	200
Tree	50	75	100
Forb	25	75	100
Total	**1050**	**2250**	**3400**

Figure 12. Plant community growth curve (percent production by month). TX4805, Mid/Shortgrass Dominant Community. Mid and shortgrasses with increasing trees and shrubs..

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

Pathway 1.1A
Community 1.1 to 1.2

A shift to the 1.2 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

This community can be taken back to community 1.1 through the use of prescribed grazing and prescribed burning.

State 2
Shrubland

Dominant plant species

- blackbrush acacia (*Acacia rigidula*), shrub
- Schaffner's wattle (*Acacia schaffneri*), shrub

Community 2.1
Mid/Shortgrass Shrubland Complex

This plant community develops because of continued heavy grazing which reduces biomass production and litter accumulation. Fire frequency and intensity is greatly reduced. Other subtle impacts occur on the site as water, mineral, and energy cycles are altered. Midgrasses are significantly reduced and the sacatons, false Rhodesgrass, silver bluestem, Arizona cottontop, and other palatable midgrasses may be absent. Midgrasses such as pink pappusgrass, white tridens, hooded windmillgrass and sand dropseed are the most common midgrasses. Shortgrasses such as curly mesquite, buffalograss, whorled dropseed, and Hall’s panicum are more common than in the reference community and represent a higher percentage of herbaceous production. Due to reduced grass canopy, decreased fire frequency, and more exposed soil surface, woody species begin to increase on the site. Early woody increasers may include blackbrush acacia, twisted acacia, lotebush, javelina bush, allthorn goatbush, prickly pear, and mesquite.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	750	1000	2000
Shrub/Vine	150	250	325
Forb	75	125	200
Tree	75	125	175
Total	**1050**	**1500**	**2700**

Figure 14. Plant community growth curve (percent production by month). TX4801, Mid/Shortgrasses Shrubland Community. Mid and shortgrasses with forbs and 20-50% woody canopy..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	2	10	20	20	5	8	15	10	6	2

Community 2.2

Wooded Grassland

Figure 15. 2.2 Wooded Grassland Community

This community is somewhat similar to community 2.1 except that midgrasses only grow within the woody shrubs and are dominated by shortgrasses such as curly mesquite, buffalograss, whorled dropseed, and Hall's panicum. In this community, fire is a rare occurrence due to woody canopy and drastically reduced fine fuel loads. Woody shrubs such as blackbrush acacia, twisted acacia, spiny hackberry, allthorn goatbush, lotebush, guayacan, prickly pear, and appear throughout. Many wildlife species find this community suitable and some landowners manage towards this community.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	400	700	1500
Shrub/Vine	300	500	700
Tree	100	150	250
Forb	75	125	200
Total	**875**	**1475**	**2650**

Figure 17. Plant community growth curve (percent production by month). TX4804, Wooded Grassland Community, >40% canopy. Midgrasses are found only within thorny shrubs having woody canopies exceeding 40 percent and interspaces are dominated by shortgrasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	2	10	20	20	5	8	15	10	6	2

Pathway 2.1A
Community 2.1 to 2.2

A shift to the to Community 2.2 occurs if brush management is not accomplished. Drought hastens the process. A lack of brush management allows existing brush to gain in stature. Seedlings are introduced through droppings from livestock and wildlife. A reduction in midgrass also corresponds in a reduction of fuel loading needed for fire to effectively suppress woody species, although fire is a questionable at this point.

Pathway 2.2A
Community 2.2 to 2.1

Managerial activities that restore the hydrologic cycle, such as the energy captured by midgrasses, and restored ground cover will tend to move the Community 2.2 toward the Mid/Shortgrass Shrubland Complex (2.1). Selective brush management is needed to accomplish the desired canopy level and spatial arrangement of woody species. Integrated brush management and utilizing historic ecological disturbances such as herbivory and fire in are needed to maintain the desired brush densities. The time to shift back to the 10 to 40 percent canopy is dependent upon

favorable growing conditions and could take three to five years.

State 3
Seeded

Dominant plant species

- Rhodes grass (*Chloris gayana*), grass

Community 3.1
Introduced/Native Species

This community is a result of the land manager planting introduced or native grass species. Seeding with native species is uncommon due to the lack of-availability of seeds that are adapted to saline soils of South Texas. Although this site is infrequently plowed due to salt and sodium content, mechanical manipulation has been done in some instances. When mechanical manipulation is done, the site is usually seeded to bell Rhodesgrass (*Chloris gayana*) or Kleberg bluestem. Either of these species, most commonly Kleberg bluestem, may invade this site when soils are denuded and native grasses are removed by overgrazing. Seeds of both Kleberg bluestem and bell Rhodesgrass are wind borne and a ready seed source is available from public roadways. Once the site is established to either of these species, return to a native state is extremely difficult, if not impossible.

Table 9. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	500	1200	2500
Shrub/Vine	50	75	125
Tree	50	75	125
Forb	25	50	75
Total	**625**	**1400**	**2825**

Figure 19. Plant community growth curve (percent production by month). TX4806, Converted Land Community - Introduced Seeding. Seeded into 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

State 4
Shrub/Cacti/Saladillo Complex

Dominant plant species

- hooded windmill grass (*Chloris cucullata*), grass

Community 4.1
Shrub/Cacti/Saladillo Complex

The pathway to this state is not well understood. Perhaps continuous excessive grazing removes both mid and shortgrasses, as well as woody seedlings, preventing the initial transition to communities 2.1 or 2.2. This community might also be achieved by mechanical manipulation like root-plowing, which destroys woody plants and native herbaceous plants. Regardless of the pathway, this state is dominated by shortgrasses. Cacti and woody shrubs may be present. In this state, there is excessive bare ground and Texas varilla is almost always present. Due to wind and water erosion, plants are often pedastalled. Salts may be present on the soil surface. The water cycle is drastically altered, and this state is in a perennial drought. It is doubtful that Community 4.1 can be changed to any other state.

Table 10. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	100	300	500
Shrub/Vine	200	300	400
Forb	200	300	400
Tree	0	0	0
Total	**500**	**900**	**1300**

Figure 21. Plant community growth curve (percent production by month). TX4807, Shrub/Cacti/Saladillo Complex. Shrubs and Cacti community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1	2	10	20	20	5	8	15	10	6	2

Transition T1A
State 1 to 2

The Grassland State will cross a threshold to Shrubland (State 2) with abusive grazing and without brush management or 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 than the herbaceous plants. Because of the increased canopy, sunlight is being captured by the woody plants and converted to energy instead 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. Planting is usually done following brush management.

Transition T1C
State 1 to 4

This transition is not fully understood, but the driver is replacement of midgrasses by shortgrasses and cacti.

Restoration pathway R2A
State 2 to 1

Brush management is the key driver in restoring State 2 back to the Grassland State (1). Reduction in woody canopy below 20 percent will take large energy inputs depending on the canopy cover. A prescribed grazing plan and prescribed burning plan will keep the state functioning.

Transition T2A
State 2 to 3

The transition to the Seeded 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 Seeded State to the Shrubland State is triggered by neglect or no management over long periods of time. Shrubs re-establish from the seed bank and introduction from wildlife and livestock. A complete return to a previous state is not possible if adapted non-native plants have been established.

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
0	**Tallgrass**			100–400	
1	**Midgrasses**			320–1400	
	alkali sacaton	SPAI	*Sporobolus airoides*	100–900	–
	false Rhodes grass	TRCR9	*Trichloris crinita*	75–500	–
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	100–400	–
	southwestern bristlegrass	SESC2	*Setaria scheelei*	50–200	–
2	**Midgrasses**			220–900	
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	100–400	–
	vine mesquite	PAOB	*Panicum obtusum*	100–400	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	0–300	–
	lovegrass tridens	TRER	*Tridens eragrostoides*	75–300	–
	Arizona cottontop	DICA8	*Digitaria californica*	100–300	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	75–300	–
3	**Mid/Shortgrasses**			200–500	
	pink pappusgrass	PABI2	*Pappophorum bicolor*	100–400	–
	white tridens	TRAL2	*Tridens albescens*	100–400	–
	Texas bristlegrass	SETE6	*Setaria texana*	50–200	–
	purple threeawn	ARPU9	*Aristida purpurea*	75–150	–
4	**Shortgrasses**			40–100	
	hooded windmill grass	CHCU2	*Chloris cucullata*	25–150	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	25–100	–
5	**Shortgrasses**			150–200	
	curly-mesquite	HIBE	*Hilaria belangeri*	100–200	–
	buffalograss	BODA2	*Bouteloua dactyloides*	50–150	–
	Hall's panicgrass	PAHA	*Panicum hallii*	25–100	–
	Madagascar dropseed	SPPY2	*Sporobolus pyramidatus*	75–100	–
	Texas grama	BORI	*Bouteloua rigidiseta*	25–50	–
	fall witchgrass	DICO6	*Digitaria cognata*	20–50	–
	red grama	BOTR2	*Bouteloua trifida*	10–25	–
Forb					
6	**Forbs**			15–30	
	whitemouth dayflower	COER	*Commelina erecta*	5–10	–
	Gregg's tube tongue	JUPI5	*Justicia pilosella*	5–10	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	1–5	–
	globemallow	SPHAE	*Sphaeralcea*	1–5	–
	prairie clover	DALEA	*Dalea*	0–5	–
7	**Forbs**			10–45	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–10	–
	woolly globemallow	SPLI	*Sphaeralcea lindheimeri*	5–10	–

	ashy pricklyleaf	THTE8	*Thymophylla tephroleuca*	5–10	–
	Texas varilla	VATE2	*Varilla texana*	0–10	–
	fiveneedle pricklyleaf	THPEP	*Thymophylla pentachaeta var. pentachaeta*	0–5	–
	Forb, annual	2FA	*Forb, annual*	0–5	–
	Forb, perennial	2FP	*Forb, perennial*	0–5	–
	prairie false foxglove	AGHE4	*Agalinis heterophylla*	0–5	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	0–5	–
	prairie broomweed	AMDR	*Amphiachyris dracunculoides*	0–5	–
	low silverbush	ARHUH	*Argythamnia humilis var. humilis*	1–5	–
	Rio Grande stickpea	CACO	*Calliandra conferta*	1–5	–
	wild tantan	DEVI3	*Desmanthus virgatus*	1–5	–
	shaggy dwarf morning-glory	EVNU	*Evolvulus nuttallianus*	1–5	–
	silver dwarf morning-glory	EVSE	*Evolvulus sericeus*	1–5	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–5	–
	haplopappus	HAPLO11	*Haplopappus*	1–5	–
	Drummond's goldenbush	ISDR	*Isocoma drummondii*	0–5	–
	Berlandier's nettlespurge	JACA3	*Jatropha cathartica*	1–5	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–5	–
	fanpetals	SIDA	*Sida*	1–5	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–5	–
Shrub/Vine					
8	**Shrubs/Vines**			50–100	
	fourwing saltbush	ATCA2	*Atriplex canescens*	25–50	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	10–20	–
	pricklypear	OPUNT	*Opuntia*	5–20	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	5–10	–
	javelina bush	COER5	*Condalia ericoides*	5–10	–
	clapweed	EPAN	*Ephedra antisyphilitica*	5–10	–
	Texan goatbush	CAERT	*Castela erecta ssp. texana*	5–10	–
	blackbrush acacia	ACRI	*Acacia rigidula*	5–10	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	1–6	–
	Brazilian bluewood	COHO	*Condalia hookeri*	0–5	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	1–5	–
	leatherstem	JADI	*Jatropha dioica*	1–5	–
	crown of thorns	KOSP	*Koeberlinia spinosa*	0–5	–
	Schaffner's wattle	ACSCB	*Acacia schaffneri var. bravoensis*	0–5	–
	whitebrush	ALGR2	*Aloysia gratissima*	0–5	–
	catclaw acacia	ACGRG3	*Acacia greggii var. greggii*	1–5	–
	catclaw acacia	ACGRW	*Acacia greggii var. wrightii*	0–5	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	0–5	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	0–5	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	1–5	

	lotebush	ZIOB	*Ziziphus obtusifolia*	1–3	–
Tree					
9	**Tree**			50–100	
	honey mesquite	PRGL2	*Prosopis glandulosa*	50–100	–

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/Cacti (2/4): 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.

Seeded 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

The grassland and the shrubland communities on this site use all the water from rainfall events that occur. Research has shown that the evapotranspiration rate on the grassland and the shrubland is nearly the same. Very little water could be harvested from this site if the woody plant community is replaced by a grass dominated community.

Recreational uses

White-tailed deer, quail, javelina, and feral hogs are hunted on the site. Bird watching may also be done.

Inventory data references

Two former range site descriptions existed for this site and were referenced. In addition, extensive time was spent with range specialists and district conservationists with the NRCS and ranchers in Webb and LaSalle counties that have years of experience working with this site. Three days were spent in the field on several different ranches to

categorize this site and capture the plant communities. Appreciation is expressed to Jason Hohlt, Flavio Garza, Shanna Dunn, and Kathryn Menke for their help and expertise.

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Contact for lead author	361-409-0609
Date	04/01/2008
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.

3. **Number and height of erosional pedestals or terracettes:** None.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 0 to 5 percent bare ground. Small and non-connected areas.

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):** Minimal and short.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** 0 to 22 inches thick light brownish gray clay, moderately fine granular to very fine angular blocky structure; very hard, friable, sticky, plastic; few siliceous pebbles, threads of gypsum along crack faces; strongly effervescent; slightly alkaline.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** High canopy, basal cover and density with small interspaces should make rainfall impact negligible. This site has well drained soils, deep with 0 to 3 percent slopes which allows negligible runoff and erosion.

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 midgrasses >>

    Sub-dominant: Warm-season shortgrasses >

    Other: Forbs > Trees.

Additional: Forbs make up 5 percent species composition and shrubs/trees compose of 5 percent species composition.

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

14. **Average percent litter cover (%) and depth (in):** Litter is primarily herbaceous.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,155 to 3,775 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, pricklypear, and Texas varilla are the primary invaders.

17. **Perennial plant reproductive capability:** All species should be capable of reproduction, except during periods of prolonged drought conditions, heavy natural herbivory, and/or intense wildfires.