USDA Natural Resources Conservation Service

Ecological site R083BY016TX
Saline Clay 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.

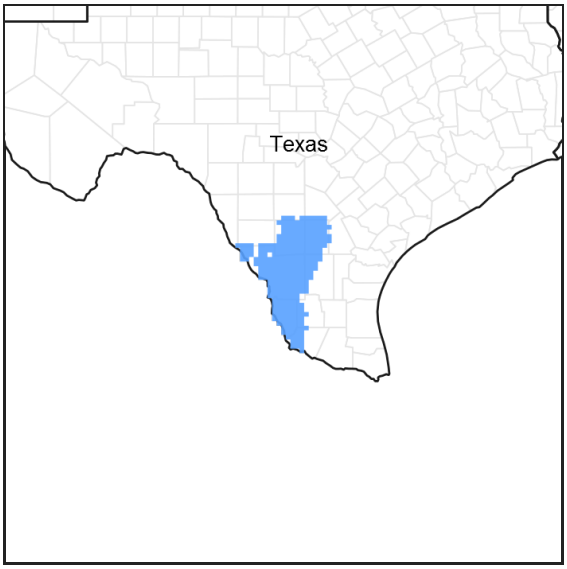


Figure 1. Mapped extent

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): 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 Loam has clay loam surface textures coupled with salts. The presence of salts creates a unique plant community.

Associated sites

R083BY003TX	**Gravelly Ridge**
R083BY015TX	**Saline Clay**
R083BY018TX	**Clay Flat**
R083BY009TX	**Clayey Bottomland**

Similar sites

R083AY016TX	**Saline Clay Loam**

Table 1. Dominant plant species

Tree	(1) *Prosopis glandulosa*
Shrub	(1) *Ziziphus obtusifolia* (2) *Celtis ehrenbergiana*
Herbaceous	(1) *Sporobolus airoides* (2) *Setaria texana*

Physiographic features

These nearly level to gently sloping soils are on ridges and interfluves on inland, dissected coastal plains. Slopes range from 0 to 5 percent but are mostly less than 3 percent. The soil formed in calcareous, saline, clay and clay loam residuum from soft-shale. Elevation ranges from 200 to 600 feet.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Ridge (2) Coastal plain > Interfluve
Runoff class	Low to medium
Flooding frequency	None
Ponding frequency	None
Elevation	61–183 m
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)	508 mm

Frost-free period (actual range)	214-365 days
Freeze-free period (actual range)	260-365 days
Precipitation total (actual range)	483-533 mm
Frost-free period (average)	270 days
Freeze-free period (average)	340 days
Precipitation total (average)	508 mm

Climate stations used

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

Influencing water features

Water features do not influence this site.

Wetland description

N/A.

Soil features

The soils are very deep, well drained, slowly permeable to impermeable with neutral to moderately alkaline pH. Shrink-swell potential is high. Normally, salinity and sodicity levels become elevated within 30 inches of the surface. Soils correlated to this site include: Altita, Charco, and Moglia.

Table 4. Representative soil features

Parent material	(1) Residuum–shale
Surface texture	(1) Sandy clay loam (2) Clay loam
Family particle size	(1) Fine-loamy
Drainage class	Well drained
Permeability class	Slow to moderate
Soil depth	203 cm
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–12.7 cm
Calcium carbonate equivalent (0-101.6cm)	0–25%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (15.2-139.7cm)	5–40

Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–7%
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.

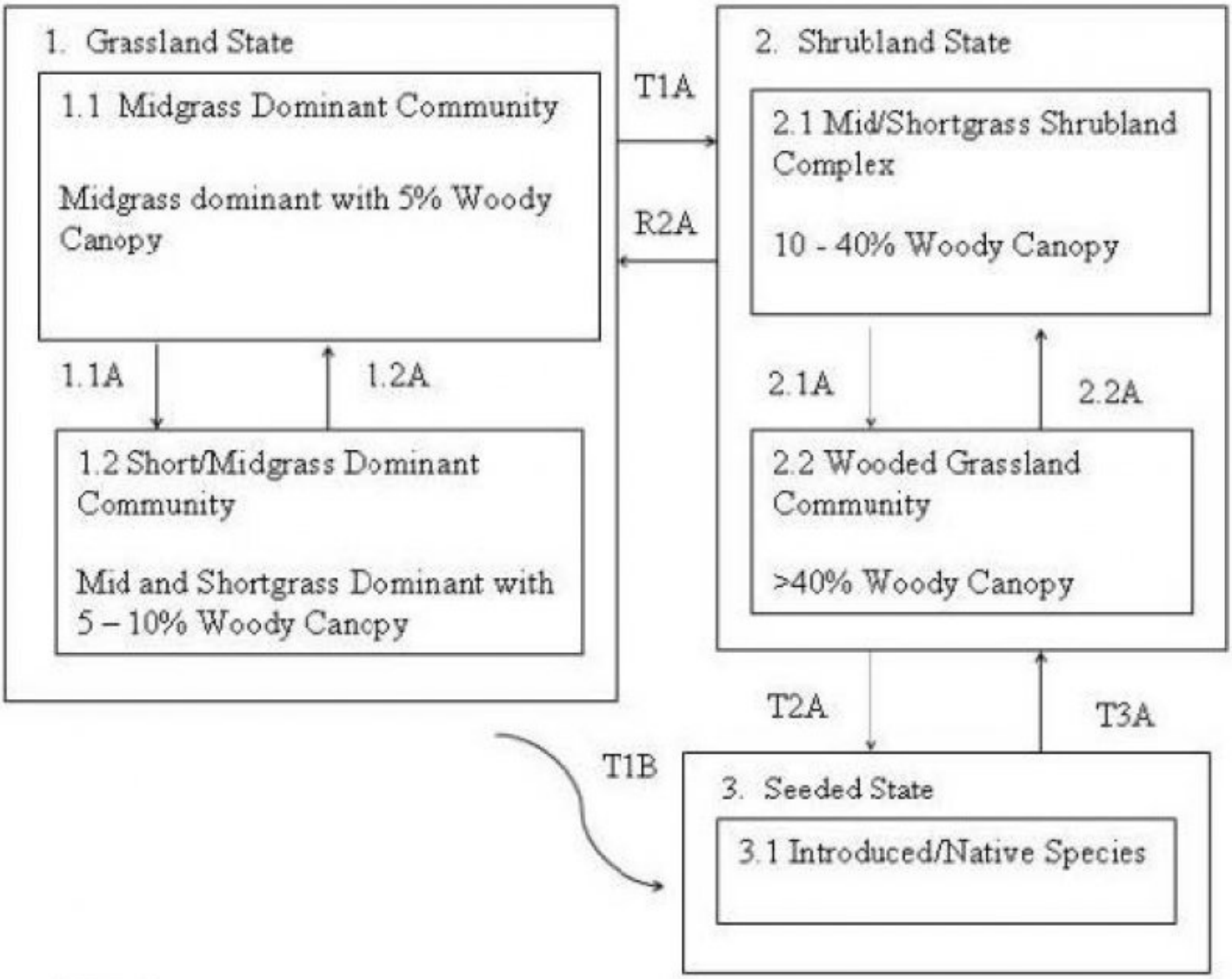
With the arrival of European man, the South Texas area was fenced and, in many instances, stocked beyond its capability to sustain forage. This overstocking led to a reduced fire frequency and intensity, creating an opportunity for woody shrubs to increase across the landscape. As the natural graze-rest 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 Saline Clay Loam is a mosaic of midgrass-dominated grasslands with scattered woody shrubs. The midgrasses include multi-flowered false Rhodesgrass (*Trichloris pluriflora*), two-flowered trichloris (*Trichloris crinita*), Arizona

cottontop (*Digitaria californica*), plains bristlegrass (*Setaria macrostachya*), pink pappusgrass (*Pappophorum bicolor*), silver bluestem (*Bothriochloa laguroides*), and plains lovegrass (*Eragrostis intermedia*). Shortgrasses included hooded windmill grass (*Chloris cucullata*), curly mesquite (*Hilaria belangeri*), and lovegrass tridens (*Tridens eragrostoides*). Forbs common to this site include bush sunflower (*Simsia calva*), orange zexmenia (Wedelia texana), sensitivebriar (Mimosa spp.), and arrowleaf sida (Sida spp.). Woody shrubs common to the site are blackbrush acacia (*Acacia rigidula*), spiny hackberry (*Celtis ehrenbergiana*), condalia (Condalia spp.), four-wing saltbush (*Atriplex canescens*), allthorn (*Koeberlinia spinosa*), goatbush (*Castela erecta* var. texana), and prickly pear (Opuntia spp.).

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
T2A – Brush Management, Range Planting, Pasture Planting, Prescribed Grazing

Figure 8. STM

State 1
Grassland

Dominant plant species

- multiflower false Rhodes grass (*Trichloris pluriflora*), grass
- false Rhodes grass (*Trichloris crinita*), grass

Community 1.1
Midgrass Dominant

The reference plant community is an open grassland dominated by midgrasses including multi-flowered false Rhodesgrass, two-flowered trichloris, alkali sacaton, silver bluestem and Arizona cottontop. There are shortgrasses such as curly mesquite present, but in limited amounts. Perennial forbs including bushsunflower, orange zexmenia, and erect dayflower are common. Scattered individual and mottes of woody plants occurred, making up less than 10 percent of the total composition. These included blackbrush acacia, spiny hackberry, lotebush, and allthorn goatbush. An occasional honey mesquite dotted the landscape. The community is maintained by periodic fires (5 to 10 years), browsing, and grazing.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	953	2690	3811
Shrub/Vine	168	224	280
Forb	112	168	224
Tree	28	56	84
Total	**1261**	**3138**	**4399**

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
Short/Midgrass Dominant

Figure 11. 1.2 Short/Midgrass Dominant Community

This community is resilient, still under the influence of periodic fires, and can easily be transitioned back to community 1.1. This community is stable and maintainable. Continued heavy grazing, coupled with drought cycles, causes the dominant midgrasses to decrease in composition. The opening of the midgrass canopy has caused shortgrasses to increase, forbs to become more abundant, and woody seedlings are able to increase slightly. At this point in time, with reduction in stocking rates, periodic rest, and increased fire frequency, this community can be maintained or shifted back to the previous community. If overgrazing continues, midgrasses will continue to decline, fire frequency and intensity will decrease, and the community will continue to decline toward a totally altered state. Such species as multi-flowered false Rhodesgrass, Arizona cottontop and alkali sacaton are replaced by pink pappusgrass, hooded windmillgrass, plains lovegrass, and perennial three-awn. Shortgrasses like curly mesquite, Hall’s panicum, and sand dropseed also increase.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	897	2130	3363
Shrub/Vine	168	252	280
Forb	112	196	280
Tree	28	84	112
Total	**1205**	**2662**	**4035**

Figure 13. Plant community growth curve (percent production by month). TX4803, Short/Midgrass Dominant Community, 10-15% woody canopy. Short and Midgrass Dominant with 10-15% 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

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
- spiny hackberry (*Celtis ehrenbergiana*), shrub

Community 2.1
Mid/Shortgrass Shrubland Complex

Continued heavy grazing, no rest, greatly reduced fire frequency, and increasing shrub canopy cover have altered this community drastically. Midgrasses, though still present, are relegated to a position within the thorny shrubs. Water, energy, and mineral cycles are altered to some extent. Although rainfall still infiltrates within the shrub community, woody plants harvest the water, limiting the amount available for herbaceous production. In addition, light rainfall events are intercepted by woody canopies and stems and evaporate before reaching the soil surface. In this community, fire frequency and intensity are greatly reduced because of reduced fuel loads and litter accumulation. This state can be converted back to State 1 through the use of brush management, prescribed burning, and prescribed grazing. To do so requires significant energy input, outlays of capital, and relatively long periods of time. Because the shrub species are relatively resistant to most herbicides, mechanical methods of brush management are most often utilized. Rootplowing on this site should be avoided because this mechanism brings salt to the surface thereby increasing salinity in the surface horizons. Following brush management, periodic rest periods and appropriate stocking rates will be needed to restore the original plant community.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	616	1457	2354
Shrub/Vine	168	336	392
Forb	84	224	336
Tree	56	112	168
Total	**924**	**2129**	**3250**

Figure 15. 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 16. 2.2 Wooded Grassland Community

The Wooded Grassland Community has woody canopies exceeding 40 percent. Midgrasses are found only within thorny shrubs and interspaces. Curly mesquite, Hall's panicum, whorled dropseed may be the only species present. Fire on the site in this state is almost non-existent. This site can be brought back to state 2.1 but not without extensive input of energy and outlays of capital. Because of the diverse woody community, this site in this state is most often manipulated by roller-chopping to enhance it for white-tailed deer, northern bobwhite, or scaled quail. To further enhance it for wildlife, the woody plant community can be manipulated and grazed to maximize use for target species. Many landowners find managing towards this community for wildlife the most suitable option.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	448	1009	1457
Shrub/Vine	168	392	448
Forb	112	280	336
Tree	56	168	224
Total	**784**	**1849**	**2465**

Figure 18. 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 (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	785	1345	2354
Shrub/Vine	56	112	168
Tree	28	84	140
Forb	28	84	140
Total	**897**	**1625**	**2802**

Figure 20. Plant community growth curve (percent production by month). TX4762, Introduced Grass Community. Planted into introduced grasses for pasture planting..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	20	20	5	10	15	10	5	0

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.

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 10. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Midgrasses**			448–1905	
	alkali sacaton	SPAI	*Sporobolus airoides*	112–560	–
	multiflower false Rhodes grass	TRPL3	*Trichloris pluriflora*	112–504	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	112–336	–
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	112–336	–
	false Rhodes grass	TRCR9	*Trichloris crinita*	56–280	–
	Arizona cottontop	DICA8	*Digitaria californica*	56–168	–
2	**Grasses**			280–953	
	pink pappusgrass	PABI2	*Pappophorum bicolor*	112–392	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	112–280	–
	plains lovegrass	ERIN	*Eragrostis intermedia*	112–280	–

	lovegrass tridens	TRER	*Tridens eragrostoides*	84–224	–
3	**Grasses**			112–504	
	purple threeawn	ARPU9	*Aristida purpurea*	28–224	–
	Texas bristlegrass	SETE6	*Setaria texana*	112–224	–
	southwestern bristlegrass	SESC2	*Setaria scheelei*	56–168	–
	slim tridens	TRMUM	*Tridens muticus var. muticus*	28–112	–
	Texas cottontop	DIPA6	*Digitaria patens*	28–112	–
4	**Shortgrasses**			112–448	
	curly-mesquite	HIBE	*Hilaria belangeri*	56–168	–
	Hall's panicgrass	PAHA	*Panicum hallii*	22–112	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	56–112	–
	fall witchgrass	DICO6	*Digitaria cognata*	6–56	–
	buffalograss	BODA2	*Bouteloua dactyloides*	22–56	–
	Madagascar dropseed	SPPY2	*Sporobolus pyramidatus*	11–22	–
	knot grass	SEREF	*Setaria reverchonii ssp. firmula*	6–11	–
	Texas grama	BORI	*Bouteloua rigidiseta*	0–6	–
	red grama	BOTR2	*Bouteloua trifida*	0–6	–
Forb					
5	**Forbs**			56–112	
	awnless bushsunflower	SICA7	*Simsia calva*	28–56	–
	whitemouth dayflower	COER	*Commelina erecta*	11–22	–
	Gregg's tube tongue	JUPI5	*Justicia pilosella*	6–22	–
6	**Forbs**			28–56	
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	22–45	–
	prairie clover	DALEA	*Dalea*	11–34	–
	globemallow	SPHAE	*Sphaeralcea*	6–22	–
7	**Forbs**			28–56	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	11–56	–
	fanpetals	SIDA	*Sida*	11–34	–
	Forb, perennial	2FP	*Forb, perennial*	6–22	–
	Rio Grande stickpea	CACO	*Calliandra conferta*	6–17	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–17	–
	Drummond's goldenbush	ISDR	*Isocoma drummondii*	0–17	–
	weakleaf bur ragweed	AMCO3	*Ambrosia confertiflora*	6–11	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–11	–
	bristleleaf pricklyleaf	THTE7	*Thymophylla tenuiloba*	6–11	–
	cheeseweed mallow	MAPA5	*Malva parviflora*	1–6	–
	smartweed leaf-flower	PHPO3	*Phyllanthus polygonoides*	1–6	–
	desert goosefoot	CHPR5	*Chenopodium pratericola*	1–6	–
	Texas bindweed	COEQ	*Convolvulus equitans*	1–6	–
	Forb, annual	2FA	*Forb, annual*	1–6	–
Shrub/Vine					
8	**Shrubs/Vines**			168–280	
	lotebush	ZIOB	*Ziziphus obtusifolia*	22–78	–

	blackbrush acacia	ACRI	*Acacia rigidula*	11–56	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	22–56	–
	Brazilian bluewood	COHO	*Condalia hookeri*	11–56	–
	pricklypear	OPUNT	*Opuntia*	11–22	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	11–22	–
	catclaw acacia	ACGRG3	*Acacia greggii var. greggii*	11–22	–
	Schaffner's wattle	ACSCB	*Acacia schaffneri var. bravoensis*	6–11	–
	whitebrush	ALGR2	*Aloysia gratissima*	6–11	–
	Texan goatbush	CAERT	*Castela erecta ssp. texana*	6–11	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	6–11	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	6–11	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	1–11	–
	clapweed	EPAN	*Ephedra antisyphilitica*	6–11	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	6–11	–
	leatherstem	JADI	*Jatropha dioica*	0–6	–
	crown of thorns	KOSP	*Koeberlinia spinosa*	1–6	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	1–6	–
	Texas paloverde	PATE10	*Parkinsonia texana*	1–6	–
	javelina bush	COER5	*Condalia ericoides*	1–6	–
	catclaw acacia	ACGRW	*Acacia greggii var. wrightii*	2–6	–
	Shrub, other	2S	*Shrub, other*	1–6	–
Tree					
9	**Trees**			28–84	
	honey mesquite	PRGL2	*Prosopis glandulosa*	28–84	–

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.

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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Acknowledgments

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Rangeland health reference sheet

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

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Contact for lead author	361-241-0609
Date	03/01/2008
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:** Somewhat, because of location on toe slopes of hills and ridges.

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):** Depth is from 4 to 12 inches, dark grayish brown (10YR 4/2) clay loam or sandy clay loam; moderate fine subangular blocky structure; hard and friable; neutral to mildly alkaline; many fine and medium roots; few fine tubular pores; noncalcareous; SOM is 0 to 3 percent.

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 > Shrubs/Vines > Trees

    Additional: Forbs make up to five percent of species composition, shrubs and trees compose five 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):** 2,250 to 3,750 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:** Woody increasers that invade include blackbrush acacia, lotebush, allthorn goatbush, whitebrush, and prickly pear. Drummond's goldenweed may invade this site heavily. Introduced grasses that may invade include Kleberg bluestem.

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