USDA Natural Resources Conservation Service

Ecological site R083AY016TX
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.

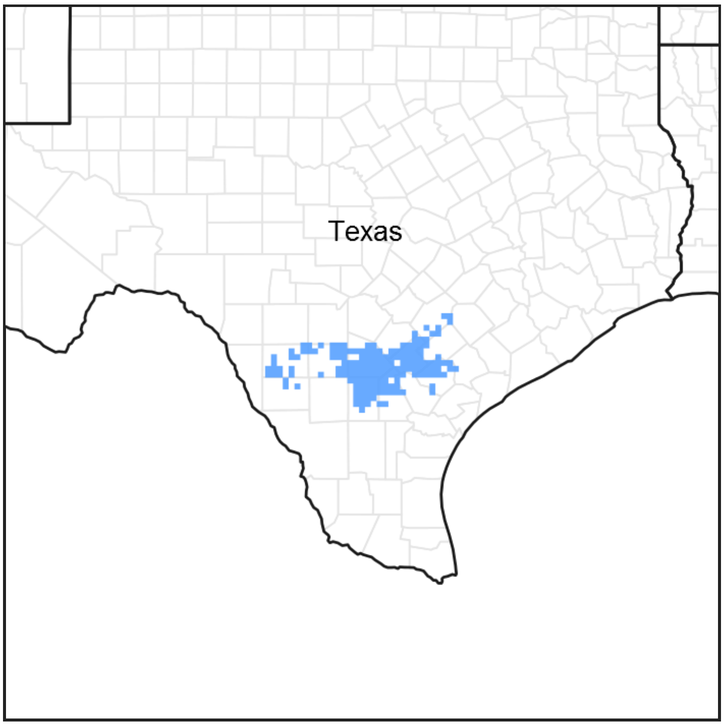

Figure 1. Mapped extent

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

Associated sites

R083AY017TX	**Blackland**
R083AY024TX	**Tight Sandy Loam**
R083AY027TX	**Western Clay Loam**

Similar sites

R083BY016TX	**Saline Clay Loam**

Table 1. Dominant plant species

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

Physiographic features

These soils are on side slopes or shoulders of interfluves. Slopes range from 0 to 8 percent. 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	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) MATHIS 4 SSW [USC00415661], Mathis, TX
- (6) PLEASANTON [USC00417111], Pleasanton, TX
- (7) UVALDE 3 SW [USC00419268], Uvalde, TX

- (8) BEEVILLE 5 NE [USC00410639], Beeville, TX
- (9) CROSS [USC00412125], Tilden, TX
- (10) GOLIAD [USC00413618], Goliad, TX
- (11) LYTLE 3W [USC00415454], Natalia, TX
- (12) TILDEN 4 SSE [USC00419031], Tilden, TX
- (13) HONDO MUNI AP [USW00012962], Hondo, TX
- (14) CHEAPSIDE [USC00411671], Gonzales, TX
- (15) CUERO [USC00412173], Cuero, TX
- (16) HONDO [USC00414254], Hondo, TX
- (17) NIXON [USC00416368], Stockdale, TX
- (18) CHARLOTTE 5 NNW [USC00411663], Charlotte, TX
- (19) FOWLERTON [USC00413299], Fowlerton, TX
- (20) PEARSALL [USC00416879], Pearsall, TX
- (21) POTEET [USC00417215], Poteet, 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 deep to very deep, well drained, moderately slowly to very slowly permeable derived from calcareous clayey or loamy residuum weathered from sandstone and claystone. Soil series correlated to this site include: Campbellton and Schattel.

Table 4. Representative soil features

Parent material	(1) Residuum–shale
Surface texture	(1) Clay loam (2) Loam (3) Sandy clay loam (4) Clay
Family particle size	(1) Fine
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to very slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%

Available water capacity (0-101.6cm)	10.16–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–25%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–2%
Subsurface fragment volume >3" (Depth not specified)	0–1%

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. Whitetail 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

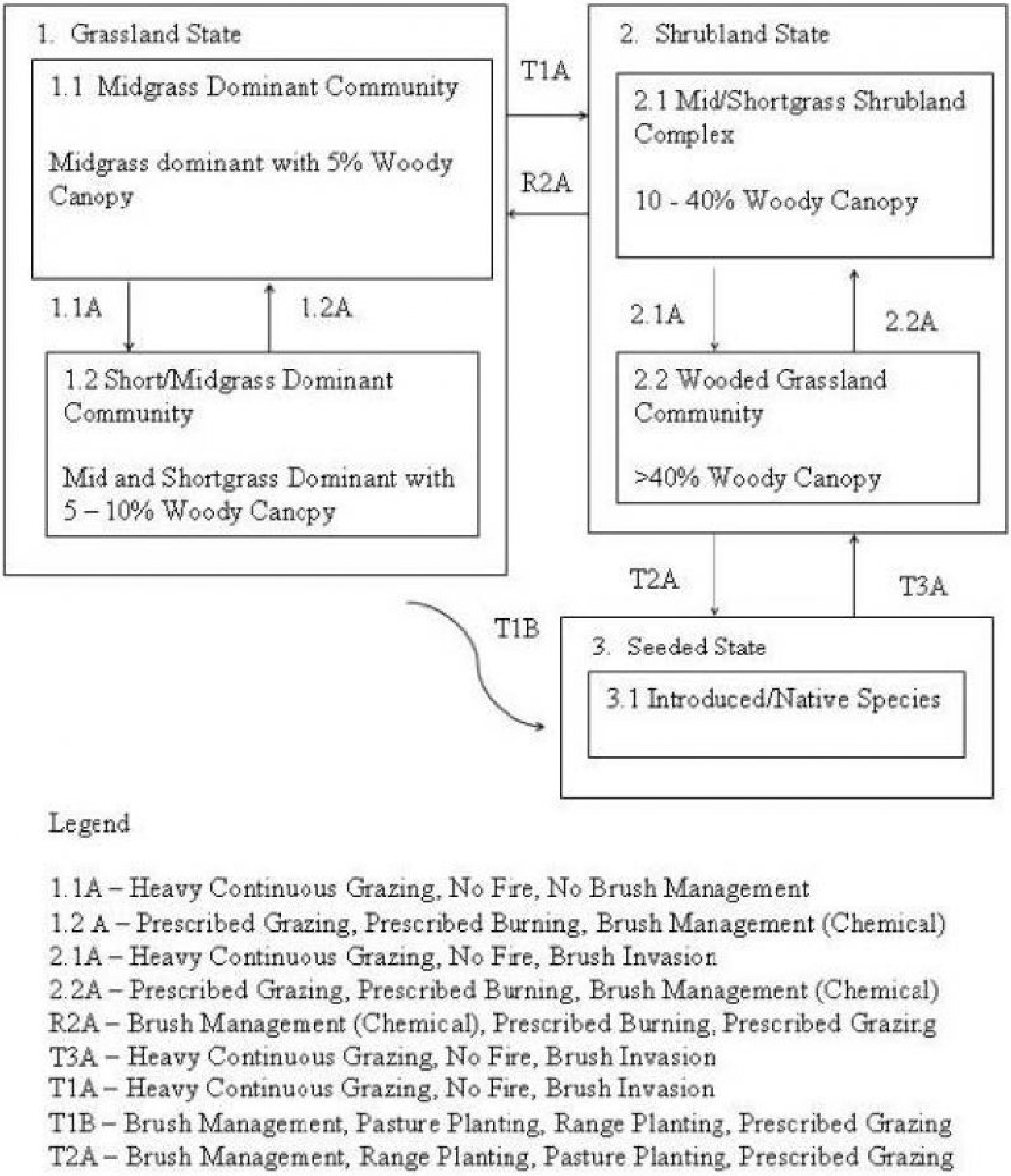

Figure 8. STM

State 1
Grassland

Dominant plant species

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

- alkali sacaton (*Sporobolus airoides*), 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

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 12. 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 1.2A
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

- pink pappusgrass (*Pappophorum bicolor*), grass
- Arizona cottontop (*Digitaria californica*), grass

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, 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 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

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 16. 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 2.2A
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 18. 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. 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 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	–
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	112–336	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	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	–
	Texas cottontop	DIPA6	*Digitaria patens*	28–112	–
	slim tridens	TRMUM	*Tridens muticus var. muticus*	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	–
	buffalograss	BODA2	*Bouteloua dactyloides*	22–56	–
	fall witchgrass	DICO6	*Digitaria cognata*	6–56	–
	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	–
	Forb, annual	2FA	*Forb, annual*	1–6	–
	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	–
Shrub/Vine					
8	**Shrubs/Vines**			168–280	
	lotebush	ZIOB	*Ziziphus obtusifolia*	22–78	–
	Brazilian bluewood	COHO	*Condalia hookeri*	11–56	–
	blackbrush acacia	ACRI	*Acacia rigidula*	11–56	–
	spiny hackberry	CEEH	*Celtis ehrenbergiana*	22–56	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	11–22	–
	catclaw acacia	ACGRG3	*Acacia greggii var. greggii*	11–22	–
	pricklypear	OPUNT	*Opuntia*	11–22	–
	desert yaupon	SCCU4	*Schaefferia cuneifolia*	6–11	–
	lime pricklyash	ZAFA	*Zanthoxylum fagara*	6–11	–
	Texas lignum-vitae	GUAN	*Guaiacum angustifolium*	6–11	–
	clapweed	EPAN	*Ephedra antisyphilitica*	6–11	–
	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	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	1–11	–
	javelina bush	COER5	*Condalia ericoides*	1–6	–
	catclaw acacia	ACGRW	*Acacia greggii var. wrightii*	2–6	–

	Shrub, other	2S	*Shrub, other*	1–6	–
	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	–
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, 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

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

Information presented was derived from the revised Range Site, literature, limited NRCS clipping data (417s), field observations, and personal contacts with range-trained personnel.

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Approval

Bryan Christensen, 9/19/2023

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.

Author(s)/participant(s)	Vivian Garcia, RMS, NRCS, Corpus Christi, Texas
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.

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2. **Presence of water flow patterns:** Somewhat, because of location on toe slopes of hills and ridges.

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

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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.

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5. **Number of gullies and erosion associated with gullies:** None.

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None.

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.

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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.

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

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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.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** 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.

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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.
