USDA Natural Resources Conservation Service

Ecological site R086BY002TX
Claypan Prairie

Last updated: 9/21/2023
Accessed: 05/11/2025

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.

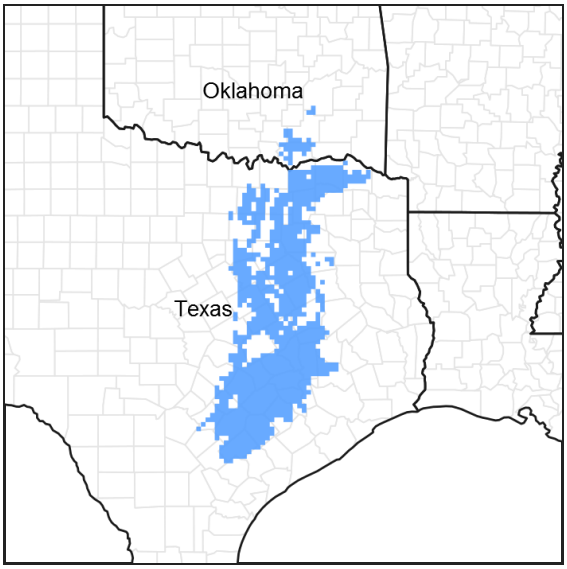


Figure 1. Mapped extent

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): 086B–Texas Blackland Prairie, Southern Part

MLRA 86B, the Southern Part of the Texas Blackland Prairie is located in east-central Texas. It makes up about 2,925 square miles (7,585 square kilometers). The towns of Brenham, Caldwell, La Grange, Schulenberg, Hallettsville, and Navasota are in the eastern part while Lincoln, Benchley, and Normangee are in the western part. The area supports tall and mid-grass prairies, but improved pasture, croplands, and urban development account for the majority of the acreage.

Classification relationships

USDA-Natural Resources Conservation Service, 2006.
-Major Land Resource Area (MLRA) 86B

Ecological site concept

The Claypan Prairie is characterized by loamy surface soils underlain by dense, hard clays. This "claypan" restricts air and water movements, as well as root penetration.

Associated sites

R086BY001TX	**Chalky Ridge** The Chalky Ridge site is often upslope from the Claypan Prairie site. It differs from the site by having shallow soils and low soil fertility.
R086BY005TX	**Blackland** The Blackland site is often adjacent to the Claypan Prairie site. It differs from the site by having a deeper clay soils and higher production.
R086BY006TX	**Loamy Bottomland** The Claypan Prairie Site occupies large flats and provides runoff water to the Loamy Bottomland Site.
R086BY007TX	**Clayey Bottomland** The Claypan Prairie Site occupies large flats and provides runoff water to the Clayey Bottomland Site.
R086BY003TX	**Clay Loam** The Claypan Prairie site is often adjacent to the Clay Loam site. It differs from the Clay Loam site by having a fine sandy loam soil surface layer.

Similar sites

R086AY003TX	**Northern Claypan Prairie** Similar sites but different MLRA.
R086AY004TX	**Southern Claypan Prairie** Similar sites but different MLRA.

Table 1. Dominant plant species

Tree	(1) *Quercus stellata* (2) *Celtis laevigata var. reticulata*
Shrub	(1) *Symphoricarpos orbiculatus* (2) *Smilax rotundifolia*
Herbaceous	(1) *Schizachyrium scoparium* (2) *Sorghastrum nutans*

Physiographic features

This site occurs as nearly level to sloping upland. It usually lies on flatter slopes than blackland sites.

Table 2. Representative physiographic features

Landforms	(1) Plains > Ridge
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None
Elevation	200–500 ft
Slope	0–10%
Aspect	Aspect is not a significant factor

Climatic features

The climate for MLRA 86B is humid subtropical and is characterized by hot summers, especially in July and August, and relatively mild winters. Tropical maritime air controls the climate during spring, summer and fall. In winter and early spring, frequent surges of Polar Canadian air cause sudden drops in temperatures and add considerable variety to the daily weather. When these cold air masses stagnate and are overrun by moist air from the south, several days of cold, cloudy, and rainy weather follow. Generally, these occasional cold spells are of short duration with rapid clearing following cold frontal passages. The summer months have little variation in day-to-day weather

except for occasional thunderstorms that dissipate the afternoon heat. The moderate temperatures in spring and fall are characterized by long periods of sunny skies, mild days, and cool nights. Rainfall during the spring and summer months generally falls during thunderstorms, and fairly large amounts of rain may fall in a short time. High intensity rains of short duration are likely to produce rapid runoff almost anytime during the year. The amount of rain that falls varies considerably from month-to-month and from year-to-year.

Table 3. Representative climatic features

Frost-free period (average)	254 days
Freeze-free period (average)	280 days
Precipitation total (average)	42 in

Climate stations used

- (1) BRENHAM [USC00411048], Brenham, TX
- (2) HALLETTSVILLE 2 N [USC00413873], Hallettsville, TX
- (3) FLATONIA 4SE [USC00413183], Moulton, TX
- (4) LEXINGTON [USC00415193], Lexington, TX
- (5) WASHINGTON SP [USC00419491], Navasota, TX

Influencing water features

The plant community of this site is not influenced by a stream.

Wetland description

Wetlands are not associated with this site.

Soil features

The soils of this site are deep, noncalcareous sandy loams and clay loams. The topsoil is underlain at rather shallow depths by dense, hard, clayey material which restricts air, water movement, and root growth. The soils take in water slowly, but can hold large amounts of water and plant nutrients. The soils of this site give up water grudgingly to growing plants. Plants may wilt even though the soil has a comparatively high moisture content. Heavy surface crusts develop in the absence of good vegetative cover.

Soils correlated to the site include: Boonville, Bremond, Cadell, Crockett, Davilla, Flatonia, Hallettsville, Mabank, Normangee, Wilson, Zack, and Zulch.

Table 4. Representative soil features

Parent material	(1) Residuum–shale and siltstone (2) Alluvium–mudstone
Surface texture	(1) Fine sandy loam (2) Loam (3) Sandy clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained
Soil depth	50–80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–8 in

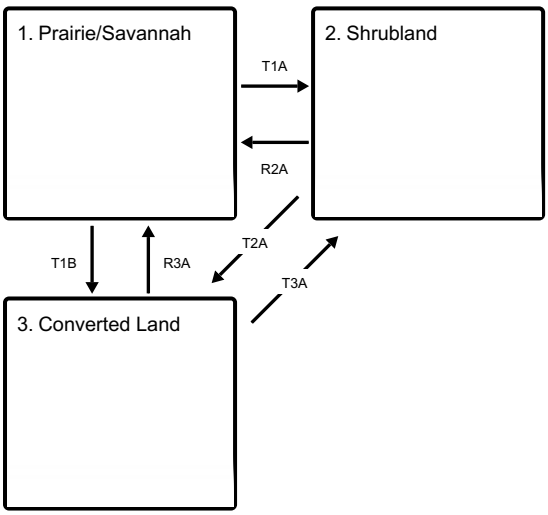
Calcium carbonate equivalent (0-40in)	0–20%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–10
Soil reaction (1:1 water) (0-40in)	5.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	1–7%
Subsurface fragment volume >3" (Depth not specified)	0–2%

Ecological dynamics

This tallgrass prairie site evolved and was maintained by the grazing and herding effects of native large ungulates, by rodents and rabbits, and by insects as well as the occurrence of periodic fire. Extreme climatic fluctuations over time may also have been important in the maintenance of the historic plant community. This site seems to be a transitional site between the Blackland (MLRA 86) sites and the Claypan Savannah (MLRA 87) sites. It contains plant species that are common to sites in both MLRAs. Continuous overgrazing by confined livestock or wildlife and the suppression of fire degrades the reference plant community. Continuous grazing will remove big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and preferred forbs such as Engelmann's daisy (*Engelmannia peristenia*), Illinois bundleflower (*Desmanthus illinoensis*), gayfeather (Liatris spp.), and compass plant (Silphium spp.). These plants will be replaced by less productive perennial and annual grasses and forbs including silver bluestem (*Bothriochloa laguroides*), windmillgrass (Chloris spp.), threeawns (Aristida spp.), croton (Croton spp.), annual broomweed (*Amphiachyris dracunculoides*), and snow on the prairie (*Euphorbia bicolor*). With continued overgrazing, no brush management, and the absence of fire, a community dominated by woody species including mesquite (*Prosopis glandulosa*), post oak (*Quercus stellata*), hackberry (Celtis spp.), winged elm (*Ulmus alata*), and eastern red cedar (*Juniperus virginiana*) will replace the grassland.

State and transition model

Ecosystem states



T1A - No fire, no brush management, improper grazing management, drought

T1B - Brush management, crop cultivation, pasture planting, nutrient management, pest management

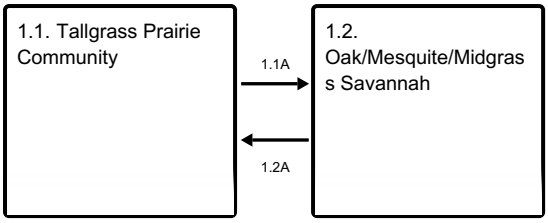
R2A - Fire, brush management, proper grazing, range planting

T2A - Brush management, crop cultivation, pasture planting, nutrient management, pest management

R3A - Fire, brush management, proper grazing, range planting

T3A - Brush management, crop cultivation, pasture planting, nutrient management, pest management

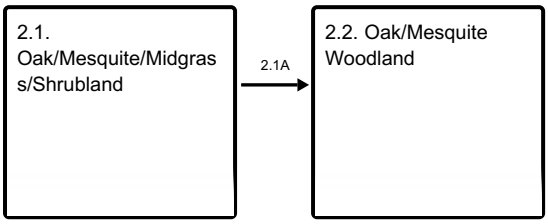
State 1 submodel, plant communities



1.1A - No fire, no brush management, improper grazing management, drought

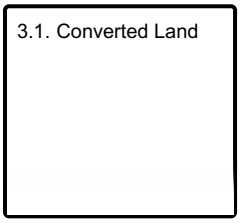
1.2A - Fire, brush management, proper grazing

State 2 submodel, plant communities



2.1A - No fire, no brush management, improper grazing management, drought

State 3 submodel, plant communities



State 1
Prairie/Savannah

Two communities exist in the Prairie/Savannah State: the 1.1 Tallgrass Prairie Community and the 1.2 Oak/Mesquite/Midgrass Savannah Community. Community 1.1 is characterized by tallgrasses dominating the understory, with woody cover less than 10 percent. Community 1.2 is characterized by a decrease in tallgrasses and an increase in midgrasses and forbs. Woody cover increases to 10 to 20 percent.

Community 1.1
Tallgrass Prairie Community

The reference plant community of this site is a prairie or very open savannah. Live oak (*Quercus virginiana*), winged elm, or hackberry may occur along water courses or in scattered mottes and provide 5 to 10 percent canopy cover. Large, old post oak trees may be widely scattered over this site. The herbaceous plant community is dominated by little bluestem and Indiangrass which usually constitutes 50 to 65 percent of the total annual yield. Switchgrass, big bluestem, Florida paspalum (*Paspalum floridanum*), sideoats grama (*Bouteloua curtipendula*), silver bluestem, and tall dropseed (*Sporobolus compositus*) are important components of the warm season grass population. Virginia wildrye (*Elymus virginicus*), Canada wildrye (*Elymus canadensis*), and Texas wintergrass (*Nassella leucotricha*) are components of the cool season grass population. Important forbs include Engelmann's daisy, gayfeather (Liatris spp.), bundleflower, prairie petunia (*Ruellia humilis*), and yellow neptunia (*Neptunia lutea*). Grazing prescriptions that permit acceptable grazing periods and allow adequate rest periods along with prescribed fire every three to five years are important in the maintenance of the reference plant community and the prairie landscape structure. Continuous overgrazing, or over-rest, and the absence of fire tend to favor a vegetative shift towards woody species such as mesquite, elm, hackberry, post oak, persimmon (*Diospyros virginiana*), and honey locust (*Gleditsia triacanthos*). Without corrective measures, this shift will continue to the Oak/Mesquite/Midgrass Savannah Community.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2400	3600	4800
Forb	300	450	600
Tree	150	225	300
Shrub/Vine	150	225	300
Total	**3000**	**4500**	**6000**

Table 6. Ground cover

Tree foliar cover	0-10%
Shrub/vine/liana foliar cover	0-10%
Grass/grasslike foliar cover	30-60%
Forb foliar cover	5-10%
Non-vascular plants	0%
Biological crusts	0%
Litter	10-20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	10-20%

Table 7. Soil surface cover

Tree basal cover	0-10%
Shrub/vine/liana basal cover	0-5%
Grass/grasslike basal cover	10-30%
Forb basal cover	1-3%
Non-vascular plants	0%
Biological crusts	0%
Litter	30-40%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	10-20%

Table 8. Canopy structure (% cover)

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

Community 1.2
Oak/Mesquite/Midgrass Savannah

This community develops in the absence of fire or mechanical or chemical brush management treatments. It is usually the result of yearly continuous grazing. Oaks and mesquite are the dominant woody plants on the site but eastern red cedar, prickly ash (*Zanthoxylum clava-herculis*), cedar elm, bumelia (*Sideroxylon lanuginosum*), coralberry (*Symphoricarpos orbiculatus*), and netleaf hackberry may also occur. Remnants of little bluestem and Indiangrass may still occur, but the herbaceous component of the community becomes dominated by lesser producing grasses and forbs. Silver bluestem, windmillgrass, white tridens (*Tridens albescens*), fall witchgrass (*Digitaria cognata*), threeawn (Aristida sp.), Texas wintergrass, prickly pear (Opuntia sp.), tasajillo (Opuntia leptocaulis), western ragweed (*Ambrosia psilostachya*), croton (Croton sp.), annual broomweed, and snow on the prairie are common occupants. The woody canopy is from 10 to 20 percent, therefore prescribed burning on a three to five year interval in conjunction with prescribed grazing is a viable option for returning this community to a tallgrass prairie that may resemble the reference plant community. If this site continues to be heavily grazed and no prescribed burning is taking place, this community will transition into the Shrubland State.

Table 9. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1800	2700	3600
Forb	300	450	600
Shrub/Vine	300	450	600
Tree	150	225	300
Total	**2550**	**3825**	**5100**

Pathway 1.1A
Community 1.1 to 1.2

The Tallgrass Prairie Community will shift to the Oak/Mesquite/Midgrass Prairie Community when there is continued growing-season stress on reference grass species. These stresses include improper grazing management that creates insufficient critical growing-season deferment, excess intensity of defoliation, repeated, long-term growing-season defoliation, long-term drought, and/or other repeated critical growing-season stress. Midgrasses and woody species are generally endemic species released by disturbance. Woody species canopy exceeding 10 percent and a species shift from tallgrass to midgrass composition indicate a transition. The driver for the shift is heavy grazing, no fire, no brush management, and/or abandonment.

Pathway 1.2A
Community 1.2 to 1.1

The Oak/Mesquite/Midgrass Savannah Community will return to the Tallgrass Prairie Community under grazing

management that provides sufficient critical growing season deferment in combination with proper grazing intensity as long as the seedbank or seed source is still present. Favorable moisture conditions will facilitate or accelerate this transition. The understory component may return to dominance by tallgrasses in the absence of fire or brush control. However, reduction of the woody component to reference conditions of 10 percent or less canopy cover will require inputs of fire or brush control.

State 2
Shrubland

Two communities exist in the Shrubland State: the 2.1 Mesquite/Midgrass Shrubland Community and the 2.2 Oak/Mesquite Woodland Community. Community 2.1 is characterized by an increase in shade-tolerant grass and an overstory canopy from 20 to 40 percent. Community 2.2 is characterized by cool-season grasses, especially Texas wintergrass, and a greater than 40 percent canopy cover.

Community 2.1
Oak/Mesquite/Midgrass/Shrubland

This community develops in the absence of fire or mechanical or chemical brush management treatments. It is usually the result of abandonment following cropping or yearly continuous grazing. In addition to the naturally occurring winged elm, hackberry, bumelia (*Sideroxylon lanuginosum*), live oak, and post oak - mesquite and eastern red cedar increase in density and canopy coverage (20 to 40 percent). In some cases, especially in abandoned cropland situations, mesquite may dominate the woody component of the community. Species whose seed is windblown (elm) or animal dispersed (mesquite, eastern red cedar, bumelia) are the first to invade and dominate the site. Remnants of little bluestem and Indiangrass may still occur, but the herbaceous component of the community becomes dominated by lesser producing grasses and forbs. Silver bluestem, windmill grass, white tridens, fall witchgrass, threeawn, Texas wintergrass, Hall's panicum (*Panicum hallii*), western ragweed, croton, annual broomweed, and snow on the prairie commonly occur. If the woody shrub canopy has not exceeded 40 percent, prescribed burning on a three to five year interval in conjunction with prescribed grazing is a viable option for returning this community to a tallgrass prairie that may resemble the reference plant community. If the woody canopy has exceeded 40 percent, chemical or mechanical brush control must be applied to move this transitional community back towards the reference plant community.

Table 10. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1200	1800	2400
Shrub/Vine	450	675	900
Forb	300	450	600
Tree	150	225	300
Total	**2100**	**3150**	**4200**

Table 11. Ground cover

Tree foliar cover	10-40%
Shrub/vine/liana foliar cover	10-20%
Grass/grasslike foliar cover	30-40%
Forb foliar cover	20-30%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	20-40%

Table 12. Soil surface cover

Tree basal cover	15-20%
Shrub/vine/liana basal cover	5-15%
Grass/grasslike basal cover	10-20%
Forb basal cover	5-10%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-20%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	20-40%

Table 13. Canopy structure (% cover)

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

Community 2.2
Oak/Mesquite Woodland

This plant community is dominated by woody species including post oak, mesquite, hackberry, eastern red cedar,

honey locust, prickly ash, and bumelia. Canopy cover exceeds 40 percent. Understory shrubs and vines include coralberry, greenbriar (Smilax sp.), grape (Vitis sp.), prickly pear (Opuntia sp.), and baccharis (*Baccharis halimifolia*). Herbaceous composition and production is directly related to canopy cover. Texas wintergrass, purpletop tridens (*Tridens flavus*), silver bluestem, threeawn, sedges (Carex sp.), croton, and annual broomweed commonly occur. If the site is not abandoned cropland, chemical brush control along with prescribed grazing and prescribed burning is a viable treatment option for moving this community back towards the reference plant community. Mechanical brush control and seeding is usually the most viable treatment option when the objective is to return this state to a community that resembles the reference plant community.

Table 14. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Tree	850	1275	1700
Grass/Grasslike	600	900	1200
Shrub/Vine	500	750	1000
Forb	150	225	300
Total	**2100**	**3150**	**4200**

Table 15. Ground cover

Tree foliar cover	40-60%
Shrub/vine/liana foliar cover	20-40%
Grass/grasslike foliar cover	10-20%
Forb foliar cover	15-30%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-10%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	20-40%

Table 16. Soil surface cover

Tree basal cover	20-40%
Shrub/vine/liana basal cover	15-25%
Grass/grasslike basal cover	5-10%
Forb basal cover	5-10%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-10%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	20-40%

Table 17. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	5-10%	5-10%
>0.5 <= 1	–	–	–	–
>1 <= 2	–	–	5-10%	10-20%
>2 <= 4.5	–	–	5-10%	–
>4.5 <= 13	–	15-25%	–	–
>13 <= 40	40-60%	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Pathway 2.1A
Community 2.1 to 2.2

The Oak/Mesquite/Midgrass Shrubland Community will transition to the Oak/Mesquite Woodland Community with continued heavy grazing, no fire, no brush management and/or abandonment. Indicators of the transition include an increased species composition of cool-season grasses and trees becoming more mature.

State 3
Converted Land

The Converted Land State contains one community, the 3.1 Converted Land Community. The state is characterized by the land manager farming crops or planted grasses.

Community 3.1
Converted Land

Conversion of the tallgrass prairie to cropland (primarily cotton, corn, and grain sorghum) began in the middle 1800's and continued into the early 1900's. Much of the prairie is in cropland today and includes additional crops of small grains (for grain and livestock grazing), soybeans, and rice. While restoration of this site to a semblance of the tallgrass prairie is possible with seeding, prescribed grazing, and prescribed burning - complete restoration of the reference plant community in a reasonable time is unlikely. If cropping is abandoned, this site is usually planted to introduced grasses and forbs and managed as pastureland. Following crop production or brush control, this site is often planted to native or introduced grasses and legumes for livestock grazing or hay production. Typical species planted include improved Bermudagrass (Cynodon spp.) varieties, dallisgrass (Paspalum dilatam), switchgrass, kleingrass (*Panicum coloratum*), old-world bluestem (Bothriochloa spp.) varieties, and various legume species. Many of the introduced species (Bermudagrass, dallisgrass, old-world bluestem) are invasive - moving by wind, water, and animals. Once established, they are extremely difficult to remove and will hinder the re-establishment of native species. The establishment and maintenance of these species requires cultivation, fertilization, weed control, and prescribed grazing management. Without the yearly application of these cultural practices, this vegetative state will move towards the Shrubland State.

Table 18. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	3000	6000	8000
Total	**3000**	**6000**	**8000**

Transition T1A
State 1 to 2

The Prairie/Savannah State will transition to the Shrubland State when continued heavy grazing pressure, no fire, no brush management, and/or field abandonment continues. The transition is evident when woody species canopy cover exceeds 20 percent and grasses shift composition to more shade-tolerant species.

Transition T1B
State 1 to 3

The transition to the Converted State occurs when the site is plowed for planting crops or pasture. The driver for the transition is the land manager's decision to farm the site.

Restoration pathway R2A
State 2 to 1

Restoration of the Shrubland State to the Prairie/Savannah State requires substantial energy input. Mechanical or herbicidal brush control treatments can be used to remove woody species. A long-term prescribed fire program may sufficiently reduce brush density, particularly if the woody component is dominated by species that are not re-sprouters. However, fire may not be sufficient to remove mature trees. Brush control in combination with prescribed fire, proper grazing management, and favorable growing conditions may be the most economical means of creating and maintaining the desired plant community. If remnant populations of tallgrasses, midgrasses, and desirable forbs are not present at sufficient levels, range planting will be necessary to restore the reference plant community.

Transition T2A
State 2 to 3

The transition to the Converted State occurs when the site is plowed for planting crops or pasture. The driver for the transition is the land manager's decision to farm the site.

Restoration pathway R3A
State 3 to 1

The restoration to State 1 can occur when the land manager ceases agronomic practices. Range planting of native species found in the reference community will be required to bring back a similar community as the State 1 plant composition. The extent of previous soil disturbances will determine how much seedbed preparation will be needed, as well as the ability to be restored. Proper grazing and brush management will be required to ensure success.

Transition T3A
State 3 to 2

The Converted Land State will transition to the Shrubland State by heavy continuous grazing, no fire, no brush management and/or abandonment. Woody species that encroach will eventually grow into the overstory and begin to shade out grasses.

Additional community tables

Table 19. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Tallgrasses**			1800–3550	
	little bluestem	SCSC	*Schizachyrium scoparium*	1800–3550	–
	Indiangrass	SONU2	*Sorghastrum nutans*	1800–3550	–
2	**Tall/Midgrasses**			450–950	
	big bluestem	ANGE	*Andropogon gerardii*	450–950	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	450–950	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	450–950	

	silver beardgrass	BOLA1	*Bothriochloa laguroides ssp. torreyana*	450–950	–
	Canada wildrye	ELCA4	*Elymus canadensis*	450–950	–
	Virginia wildrye	ELVI3	*Elymus virginicus*	450–950	–
	Texas cupgrass	ERSE5	*Eriochloa sericea*	450–950	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	450–950	–
	Florida paspalum	PAFL4	*Paspalum floridanum*	450–950	–
	switchgrass	PAVI2	*Panicum virgatum*	450–950	–
	Drummond's dropseed	SPCOD3	*Sporobolus compositus var. drummondii*	450–950	–
3	**Mid/Shortgrasses**			150–300	
	buffalograss	BODA2	*Bouteloua dactyloides*	150–300	–
	sedge	CAREX	*Carex*	150–300	–
	shortspike windmill grass	CHSU3	*Chloris ×subdolichostachya*	150–300	–
	fall witchgrass	DICO6	*Digitaria cognata*	150–300	–
	Hall's panicgrass	PAHA	*Panicum hallii*	150–300	–
	vine mesquite	PAOB	*Panicum obtusum*	150–300	–
	brownseed paspalum	PAPL3	*Paspalum plicatulum*	150–300	–
	purpletop tridens	TRFL2	*Tridens flavus*	150–300	–
	longspike tridens	TRST2	*Tridens strictus*	150–300	–
Forb					
4	**Forbs**			300–600	
	partridge pea	CHFA2	*Chamaecrista fasciculata*	300–600	–
	compact prairie clover	DACOC	*Dalea compacta var. compacta*	300–600	–
	Illinois bundleflower	DEIL	*Desmanthus illinoensis*	300–600	–
	ticktrefoil	DESMO	*Desmodium*	300–600	–
	blacksamson echinacea	ECAN2	*Echinacea angustifolia*	300–600	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	300–600	–
	Lindheimer's beeblossom	GALI2	*Gaura lindheimeri*	300–600	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	300–600	–
	coastal indigo	INMI	*Indigofera miniata*	300–600	–
	pinkscale blazing star	LIEL	*Liatris elegans*	300–600	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	300–600	–
	yellow puff	NELU2	*Neptunia lutea*	300–600	–
	whitest evening primrose	OEAL	*Oenothera albicaulis*	300–600	–
	beardtongue	PENST	*Penstemon*	300–600	–
	prairie snoutbean	RHLA5	*Rhynchosia latifolia*	300–600	–
	fringeleaf wild petunia	RUHU	*Ruellia humilis*	300–600	–
	fuzzybean	STROP	*Strophostyles*	300–600	–
	winter vetch	VIVI	*Vicia villosa*	300–600	–
5	**Forbs**			25–50	
	prairie broomweed	AMDR	*Amphiachyris dracunculoides*	25–50	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	25–50	–
	groovestem Indian	ARPL4	*Arnoglossum plantagineum*	25–50	–

	plantain				
	milkweed	ASCLE	*Asclepias*	25–50	–
	purple poppymallow	CAIN2	*Callirhoe involucrata*	25–50	–
	downy Indian paintbrush	CAPU11	*Castilleja purpurea*	25–50	–
	hogwort	CRCA6	*Croton capitatus*	25–50	–
	Carolina larkspur	DECA3	*Delphinium carolinianum*	25–50	–
	snow on the prairie	EUBI2	*Euphorbia bicolor*	25–50	–
	Dakota mock vervain	GLBIB	*Glandularia bipinnatifida var. bipinnatifida*	25–50	–
	Carolina woollywhite	HYSC	*Hymenopappus scabiosaeus*	25–50	–
	Texas lupine	LUTE	*Lupinus texensis*	25–50	–
	Nuttall's prairie parsley	PONU4	*Polytaenia nuttallii*	25–50	–
	Drummond's skullcap	SCDR2	*Scutellaria drummondii*	25–50	–
Shrub/Vine					
6	**Vines**			150–300	
	roundleaf greenbrier	SMRO	*Smilax rotundifolia*	150–300	–
	coralberry	SYOR	*Symphoricarpos orbiculatus*	150–300	–
Tree					
7	**Trees**			150–300	
	netleaf hackberry	CELAR	*Celtis laevigata var. reticulata*	150–300	–
	post oak	QUST	*Quercus stellata*	150–300	–
	live oak	QUVI	*Quercus virginiana*	150–300	–
	gum bully	SILAL3	*Sideroxylon lanuginosum ssp. lanuginosum*	150–300	–
	winged elm	ULAL	*Ulmus alata*	150–300	–

Table 20. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Small Grains**			6000–8000	
	oat	AVENA	*Avena*	6000–8000	–
	Italian ryegrass	LOPEM2	*Lolium perenne ssp. multiflorum*	6000–8000	–
	common wheat	TRAE	*Triticum aestivum*	6000–8000	–
2	**Pastureland Species**			3000–7000	
	Bermudagrass	CYDA	*Cynodon dactylon*	3000–7000	–
	switchgrass	PAVI2	*Panicum virgatum*	5000–7000	–
	kleingrass	PACO2	*Panicum coloratum*	4000–6000	–
	bahiagrass	PANO2	*Paspalum notatum*	4000–6000	–
	yellow bluestem	BOIS	*Bothriochloa ischaemum*	4000–6000	–

Animal community

Historical accounts of early Texas explorers indicate that the tallgrass prairie sites were used by bison, deer, antelope, prairie chicken, wolf, mountain lion, and black bear. Wild horses and cattle occupied these prairie sites into the middle 1800's. The conversion of these sites to row crop agriculture altered the habitat and animal communities. The cropland habitats occurring today are more favorable to migratory birds. Deer, bobcat, coyote,

and quail use these sites where woody cover is sufficient. Livestock grazing occurs on these sites that remain in native vegetation or have been converted to pastureland. Stocker cattle use crop stubble and small grain crops.

Hydrological functions

Peak rainfall periods occur in May and June from frontal passage thunderstorms and in September and October from tropical systems, as well as frontal passages. Rainfall amounts may be high (three to five inches per event) and events may become intense. The site is subject to erosion where adequate herbaceous cover is not maintained and on heavy use areas such as roads and livestock trails. Gullies feeding into streams and drains are common on this site where adequate herbaceous cover has not been maintained. Extended periods (60 days) of little to no rainfall during the growing season are common. The hydrology of this site may be manipulated through management to yield higher runoff volumes or greater infiltration to groundwater. Management for less herbaceous cover will favor higher surface runoff while dense herbaceous cover will favor ground water recharge. Potential pollution from sediment, pesticides, and both organic and inorganic fertilizers should always be considered when managing for higher volumes of surface runoff.

Recreational uses

Recreational uses of this site include hunting, camping, bird watching, equestrian, and photography.

Wood products

Mesquite, post oak, and live oak may be harvested for firewood.

Inventory data references

These site descriptions were developed as part a Provisional Ecological Site project using historic soil survey manuscripts, available site descriptions, and low intensity field traverse sampling. Future work to validate the information is needed. This will include field activities to collect low, medium, and high-intensity sampling, soil correlations, and analysis of that data. A final field review, peer review, quality control, and quality assurance review of the will be needed to produce the final document.

Other references

Diggs, G.M., B.L. Lipscomb, and R.J. O'Kennon. 1999. Illustrated Flora of North Central Texas Botanical Research Institute of Texas and Austin College, Fort Worth, TX.

Hatch, S.L, K.N. Gandhi, and L.E. Brown. 1990. Checklist of the vascular plants of Texas. Texas Agricultural Experiment Station, College Station, TX.

Contributors

Mark Moseley
Tyson Hart

Approval

Bryan Christensen, 9/21/2023

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)	Mike Stellbauer, David Polk, Bill Deauman
Contact for lead author	Mike Stellbauer, Zone RMS, NRCS, Bryan, Texas
Date	05/23/2005
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:** Some water flow patterns are normal for this site due to landscape position and slopes.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals or terracettes are uncommon for this site when occupied by the reference community.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect no more than 20 percent bare ground randomly distributed throughout.

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5. **Number of gullies and erosion associated with gullies:** Some gullies associated with seeps, springs and intermittent streams may be present. Head and side slopes should be stable and covered with vegetation.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** This site has slowly permeable soils. On sloping sites, small to medium-sized litter will move short distances with intense storms.

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

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The soil surface is less than 10 inches thick with colors from dark brown sandy loam to dark grayish brown sandy loam and generally weak fine granular structure. SOM is 0.5 to 2.0 percent.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** The savannah of trees, shrubs, vines, grasses, and forbs with adequate litter and little bare ground provides for maximum infiltration and little runoff under normal rainfall events.

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 tallgrasses >>

    Sub-dominant: Warm-season midgrasses > Forbs >

    Other: Shrubs/Vines = Trees

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** There should be little mortality or decadence for any functional groups.

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

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 3,000 pounds per acre for below average moisture years to 6,000 pounds per acre for above average moisture years.

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:** Potential invasive species include yellow bluestems, common Bermudagrass, bahiagrass, mesquite, huisache, elm, eastern red cedar, post oak, and yaupon.

17. **Perennial plant reproductive capability:** All perennial plants should be capable of reproducing, except for periods of prolonged drought conditions, heavy natural herbivory, and intense wildfires.