

## Ecological site R086BY004TX Eroded Blackland

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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.

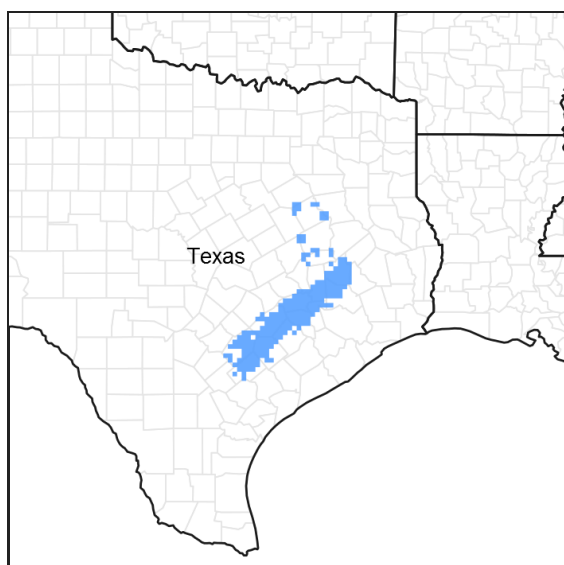


Figure 1. Mapped extent

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): 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 Eroded Blackland is characterized by an eroded surface horizon. The biomass productivity is not as high as the Blackland site due to the erosion that has partially, or completely, removed the A horizon.

## Associated sites

R086BY005TX	<b>Blackland</b> The Blackland site is in the same landscape position and often adjacent.
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## Similar sites

R086BY005TX	<b>Blackland</b> The Eroded Blackland site is similar to the Blackland site by having similar soil types and topography. It differs by having extensive erosion indicated by a partial or lost A horizon, active rills and/or gullies, and lower production.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Schizachyrium scoparium</i> var. <i>frequens</i> (2) <i>Sorghastrum nutans</i>

## Physiographic features

The site consists of gently sloping to moderately steep soils on uplands. Uncultivated areas often have narrow microridges and microvalleys that extend up and down the slope. The slope gradients range from 1 to 20 percent but are usually 5 to 12 percent. As a result of the various stages of erosion that occur on these sites, vegetative cover can vary significantly.

Table 2. Representative physiographic features

Landforms	(1) Plains > Ridge
Runoff class	Very high
Flooding frequency	None
Ponding frequency	None
Elevation	46–198 m
Slope	5–12%
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Not specified
Flooding frequency	Not specified
Ponding frequency	Not specified
Elevation	Not specified
Slope	1–20%

## 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 4. Representative climatic features**

Frost-free period (average)	254 days
Freeze-free period (average)	280 days
Precipitation total (average)	1,067 mm

## Climate stations used

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

This site consists of deep and moderately deep soils which have been damaged by erosion. The soils are calcareous clays over slowly permeable marls. The soils have high shrink-swell properties and crack when dry. Rainfall is absorbed rapidly until the soil becomes wet and the cracks close. When the soil is wet, adequate plant cover is needed to promote infiltration and minimize surface runoff and erosion. The soils are fertile and can store moderate to high amounts of water. The major soil for this Latium, with minor mapunits of Ellis and Ferris within the MLRA boundaries.

**Table 5. Representative soil features**

Parent material	(1) Residuum—shale
Surface texture	(1) Clay
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–35%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm

Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	3–6%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

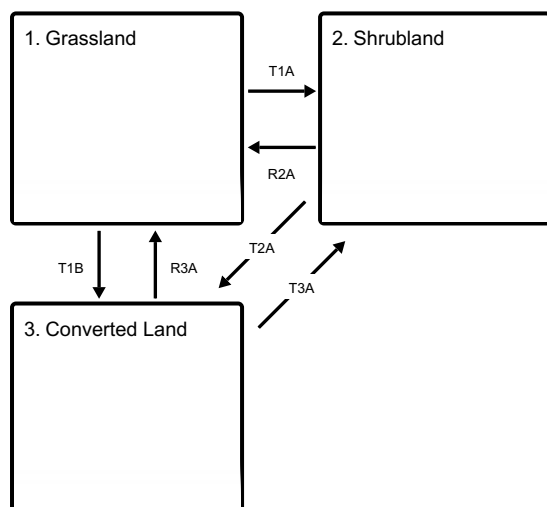
The Eroded Blackland site is a fire-influenced mosaic of tallgrass and midgrass plant communities, interspersed with a high diversity of perennial forbs and occasional woody shrubs and trees. Prior to European settlement (pre-1825), fire and infrequent but intense, short-duration grazing by large herbivores (mainly bison and to a lesser extent pronghorn antelope) were important natural landscape-scale disturbances that suppressed woody species and invigorated herbaceous species. The herbaceous prairie species adapted to fire and grazing disturbances by maintaining below-ground penetrating tissues.

The Eroded Blackland Site was historically dominated by little bluestem (*Schizachyrium scoparium*) and Indiangrass (*Sorghastrum nutans*), with big bluestem (*Andropogon gerardii*) and switchgrass (*Panicum virgatum*) acting as localized dominants. Midgrasses such as sideoats grama (*Bouteloua curtipendula*), Texas wintergrass (*Nassella leucotricha*), hairy grama (*Bouteloua hirsuta*), and dropseeds (*Sporobolus* spp.) are also abundant. A wide variety of forbs add to the diverse native plant community. Scattered live oak (*Quercus virginiana*) and hackberry (*Celtis* spp.) trees are also native to the region. On many areas of the Eroded Blacklands, cedar elm (*Ulmus crassifolia*), eastern red cedar (*Juniperus virginiana*) and honey mesquite (*Prosopis glandulosa*) dominate.

The tallgrass prairie is the reference community, but improper grazing will result in a reduction of tallgrass dominance and an increase in composition of midgrasses, unpalatable forbs, and woody species. Woody species can dominate the site in less than 50 years with improper management. Continued degradation of the site will result in the site crossing a threshold to a midgrass/shortgrass community characterized by unpalatable grasses and shrubs. Bare ground, erosion, and water flow patterns will increase, and forage production will decline. The natural vegetation on this site is predominantly tall warm-season perennial bunchgrasses with lesser amounts of midgrasses and shortgrasses.

## State and transition model

### Ecosystem states



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

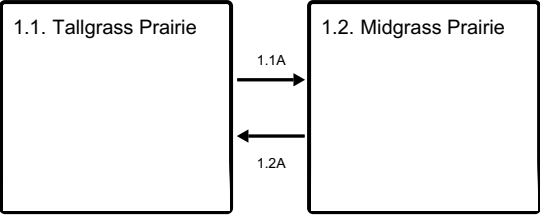
**T1B** - Brush management, crop cultivation, pasture planting, nutrient management, pest management

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

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

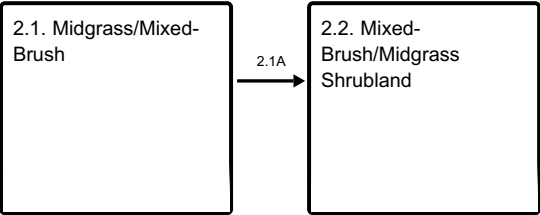
- R3A** - Fire, brush management, proper grazing, range planting
- T3A** - No fire, no brush management, heavy continuous grazing, no pest management

**State 1 submodel, plant communities**



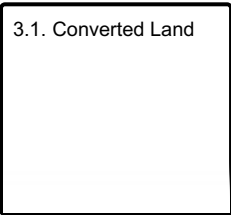
- 1.1A** - No fire, no brush management, improper grazing management, drought
- 1.2A** - Fire, brush management, proper grazing

**State 2 submodel, plant communities**



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

**State 3 submodel, plant communities**



**State 1  
Grassland**

Two communities exist in the Grassland State: the 1.1 Tallgrass Prairie Community and the 1.2 Midgrass Prairie Community. Community 1.1 is characterized by tallgrasses dominating the understory and woody species covering less than five percent of the area. Community 1.2 is characterized by midgrass dominance, but the woody species cover is 5 to 25 percent, with some species attaining heights of three feet.

**Community 1.1  
Tallgrass Prairie**



The Tallgrass Prairie Community is dominated by warm-season perennial tallgrasses, particularly little bluestem. Other important grasses include: Indiangrass, big bluestem, switchgrass, vine mesquite (panicum obtusum), silver bluestem (*Bothriochloa laguroides*), tall dropseed (*Sporobolus compositus*), and Texas wintergrass. Warm-season perennial midgrasses constitute most of the remaining species composition. The warm-season perennial forb component varies from 5 to 15 percent of the community composition depending on climatic patterns and local precipitation. Forbs commonly found include Engelmann’s daisy (*Engelmannia peristenia*), Maximilian sunflower (*Helianthus maximiliani*), and halfshrub sundrop (*Calylophus serrulatus*). Typical, but infrequent, shrub and tree species found in the reference community include species of bumelia (*Sideroxylon* spp.), hackberry, elm, and live oak. The reference grassland community will transition to a midgrass-dominated community under the stresses of improper grazing. The first species to decrease in dominance will be the most palatable and/or least grazing tolerant grasses and forbs (Indiangrass, big bluestem, and Engelmann’s daisy). This will initially result in an increase in composition of little bluestem, which will increase its dominance. If improper grazing management continues, little bluestem will decrease and midgrasses such as silver bluestem and sideoats grama will increase in composition. Less palatable forbs will increase at this stage.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1709	3138	4567
Forb	196	364	532
Shrub/Vine	112	196	280
Total	2017	3698	5379

### Community 1.2 Midgrass Prairie



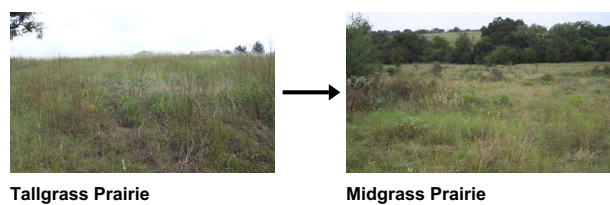
The Migrass Prairie Community develops in the absence of fire or mechanical or chemical brush management

treatments. It is usually the result of abandonment following cropping or yearly continuous grazing. Mesquite is the dominant woody plant on the site but Eastern red cedar, prickly ash (*Zanthoxylum clava-herculis*), cedar elm, bumelia, 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 (*Chloris* spp.), 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 (*Amphiachyris dracunculoides*), and snow on the prairie are common occupants. If the woody canopy has not exceeded 25 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 25 percent, chemical or mechanical brush control must be applied to move the transitional community back towards the reference plant community.

Table 7. Annual production by plant type

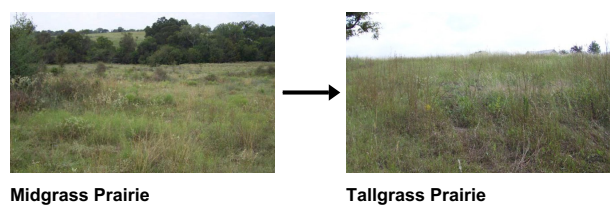
Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1485	2578	3699
Tree	336	560	785
Forb	196	336	448
Total	2017	3474	4932

### Pathway 1.1A Community 1.1 to 1.2



The Tallgrass Prairie Plant Community will shift to the Mesquite/Midgrass Prairie Plant 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 five 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 Midgrass Prairie 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 five 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 Midgrass/Mixed-Brush Community and the 2.2 Mixed-Brush/Midgrass Shrubland Community. Community 2.1 is characterized by an increase in midgrasses and an overstory canopy of between 25 and 50 percent. Community 2.2 is characterized by midgrasses, shortgrasses, and low forbs with an overstory canopy cover exceeding 50 percent.

### Community 2.1 Midgrass/Mixed-Brush



The Midgrass/Mixed-Brush Community presents a 25 to 50 percent woody plant canopy, with cedar elm, juniper, hackberry, and mesquite as the dominant species. This community type is the result of continuous improper grazing management and a lack of fire or other brush management. In areas where high deer densities occur, heavy browsing can decrease preferred woody plants. There is a continued decline in diversity of the grassland component and an increase in woody species and unpalatable forbs. Once the brush canopy exceeds 30 to 35 percent, annual understory production is very limited and is generally made up of unpalatable shrubs, grasses, and forbs within tree and shrub interspaces. Annual herbage production decreases due to a decline in soil structure and organic matter and shifts toward the woody component. All unpalatable woody species increase in size and density. Honey mesquite is an early increaser throughout the MLRA. Reference midgrasses decrease, but still remain the dominant component, while shortgrasses such as buffalograss and bermudagrass increase. Remnants of the reference grasses and forbs along with unpalatable invaders occupy the interspaces between shrubs. Cool-season species such as Texas wintergrass, plus other grazing-resistant species, can be found under and around woody plants. Plant vigor and productivity of the grassland component is reduced due to grazing pressure and competition for nutrients and water from woody plants. Common herbaceous species include threeawns (*Aristida* spp.), hairy grama (*Bouteloua hirsuta*), and upright prairie coneflower (*Ratibida columnifera*). Buffalograss, western ragweed (*Ambrosia psilostachya*), and common bermudagrass are persistent increasers until shrub density reaches maximum canopy.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	897	1569	2214
Tree	560	897	1261
Forb	224	392	560
<b>Total</b>	<b>1681</b>	<b>2858</b>	<b>4035</b>

### Community 2.2 Mixed-Brush/Midgrass Shrubland





The Mixed-Brush/Midgrass Shrubland Community is the result of many years of improper grazing, lack of periodic fires, and/or a lack of proper brush management. Cedar elm, honey mesquite, or juniper may dominate this community, which has greater than 50 percent woody canopy cover. It is now essentially a dense shrubland. With continued heavy cattle grazing and/or browsing and no brush control, the trees and shrubs can exceed 70 percent canopy cover, and potentially reach almost 100 percent cover. Some remnant midgrasses and opportunistic shortgrasses, annual forbs, and perennial forbs occupy the woody plant interspaces. Characteristic grasses are buffalograss (*Bouteloua dactyloides*) and fall witchgrass. Texas wintergrass and annuals are found in and around tree/shrub cover. Grasses and forbs make up 35 percent or less of the annual herbage production. Common forbs include dotted gayfeather (*Liatis punctata*), annual broomweed, croton (*Croton* spp.), western ragweed, upright prairie coneflower, Mexican sagewort (*Artemisia ludoviciana*), and sensitive-briar (*Mimosa* spp.). At its most extreme, this community takes on a woodland appearance: large woody species with understory dominated by low production grasses, sedges, and forbs that have low palatability and high shade tolerance. Excessive cattle grazing tends to create a different response and structure to the community than does excessive deer or goat grazing. Excessive cattle grazing also accelerates invasion of shrubs because it creates conditions where young shrubs increase in vigor and size while palatable grasses decrease in vigor and abundance. Excess deer or goat grazing tends to create a dominance of large trees by removing both young shrubs and the young twigs and branches that grow below the browse line on larger shrubs and trees. While large trees will continue to increase in size, they will have very little production below the browse line. The site becomes dominated by large trees with little forage available for livestock or wildlife. Large trees with little understory provide much less soil protection than do dense stands of grass. As soils erode, understory species have reduced potential to revegetate the site. The bare area under the browse line creates a situation that provides poor forage conditions and poor visual cover for wildlife.

Table 9. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Tree	336	785	1233
Grass/Grasslike	140	308	504
Forb	84	196	308
<b>Total</b>	<b>560</b>	<b>1289</b>	<b>2045</b>

Pathway 2.1A  
Community 2.1 to 2.2



The Midgrass/Mixed-Brush Community will transition to the Mixed-Brush/Midgrass Shrubland with continued heavy grazing, no fire, no brush management and/or abandonment. Indicators of the transition include an increased

species composition of shortgrasses and low forbs with trees becoming more mature and occupying over 50 percent of the canopy.

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 10. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	4483	6725	8967
Forb	280	560	841
Total	4763	7285	9808

Transition T1A  
State 1 to 2

The Grassland 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 25 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 Grassland 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 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tallgrass</b>			813–2158	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	813–2158	–
2	<b>Tallgrass</b>			504–1345	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	504–1345	–
	switchgrass	PAV12	<i>Panicum virgatum</i>	504–1345	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	504–1345	–
3	<b>Midgrass</b>			308–813	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	308–813	–
	silver beardgrass	BOLA2	<i>Bothriochloa laguroides</i>	308–813	–
	Texas wintergrass	NALE3	<i>Nassella leucotricha</i>	308–813	–

	vine mesquite	PAOB	<i>Panicum obtusum</i>	308–813	–
	Drummond's dropseed	SPCOD3	<i>Sporobolus compositus</i> var. <i>drummondii</i>	308–813	–
4	<b>Other Grasses</b>			112–252	
	Fendler threeawn	ARPUL	<i>Aristida purpurea</i> var. <i>longiseta</i>	112–252	–
	cedar sedge	CAPL3	<i>Carex planostachys</i>	112–252	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	112–252	–
	plains lovegrass	ERIN	<i>Eragrostis intermedia</i>	112–252	–
	Texas cupgrass	ERSE5	<i>Eriochloa sericea</i>	112–252	–
	Florida paspalum	PAFL4	<i>Paspalum floridanum</i>	112–252	–
	marsh bristlegrass	SEPA10	<i>Setaria parviflora</i>	112–252	–
	Madagascar dropseed	SPPY2	<i>Sporobolus pyramidatus</i>	112–252	–
	white tridens	TRAL2	<i>Tridens albescens</i>	112–252	–
<b>Forb</b>					
5	<b>Forbs</b>			196–532	
	yellow sundrops	CASE12	<i>Calylophus serrulatus</i>	196–532	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	196–532	–
	Engelmann's daisy	ENPE4	<i>Engelmannia peristenia</i>	196–532	–
	coastal indigo	INMI	<i>Indigofera miniata</i>	196–532	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	196–532	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	196–532	–
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	196–532	–
	purple poppymallow	CAIN2	<i>Callirhoe involucrata</i>	112–280	–
	Lindheimer's Indian paintbrush	CAPUL	<i>Castilleja purpurea</i> var. <i>lindheimeri</i>	112–280	–
	scurfpea	PSORA2	<i>Psoralegium</i>	112–280	–
	small-leaf snoutbean	RHPA2	<i>Rhynchosia parvifolia</i>	112–280	–
	Texas lupine	LUTE	<i>Lupinus texensis</i>	112–280	–
	powderpuff	MIST2	<i>Mimosa strigillosa</i>	112–280	–
	yellow puff	NELU2	<i>Neptunia lutea</i>	112–280	–
	nodding beardtongue	PELA10	<i>Penstemon laxiflorus</i>	112–280	–
	button eryngo	ERYU	<i>Eryngium yuccifolium</i>	112–280	–
	snow on the prairie	EUBI2	<i>Euphorbia bicolor</i>	112–280	–
	Texas croton	CRTE4	<i>Croton texensis</i>	112–280	–
	purple prairie clover	DAPU5	<i>Dalea purpurea</i>	84–224	–
	Carolina larkspur	DECA3	<i>Delphinium carolinianum</i>	84–224	–
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	84–224	–
	Texas prairie parsley	POTE3	<i>Polytaenia texana</i>	84–224	–
	Drummond's skullcap	SCDR2	<i>Scutellaria drummondii</i>	84–224	–
	Texas vervain	VEHA	<i>Verbena halei</i>	84–224	–
	Carolina woollywhite	HYSC	<i>Hymenopappus scabiosaeus</i>	84–224	–
<b>Shrub/Vine</b>					
6	<b>Trees, Shrubs, Vines</b>			112–280	
	live oak	QUVI	<i>Quercus virginiana</i>	112–280	–

	cedar elm	ULCR	<i>Ulmus crassifolia</i>	112–280	–
	netleaf hackberry	CELAR	<i>Celtis laevigata</i> var. <i>reticulata</i>	112–280	–
	parsley hawthorn	CRMA5	<i>Crataegus marshallii</i>	56–140	–
	eastern redcedar	JUVI	<i>Juniperus virginiana</i>	56–140	–
	Mexican plum	PRME	<i>Prunus mexicana</i>	56–140	–
	gum bully	SILA20	<i>Sideroxylon lanuginosum</i>	56–140	–
	coralberry	SYOR	<i>Symphoricarpos orbiculatus</i>	56–140	–

## Animal community

As a historic tall grass prairie, this site was occupied by bison, antelope, deer, prairie chickens, quail, turkey, and dove. This site was also used by many species of grassland songbirds, migratory waterfowl, coyotes, and wolves. This site now provides forage for livestock and is still used by quail, dove, migratory waterfowl, migratory and resident grassland birds, and coyotes. Deer use the site when mesquite and associated woody species occur in sufficient densities and proper structure to provide adequate cover.

## 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 passage thunderstorms. Rainfall amounts may be high (three to five inches per event) and events may be 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. Extended periods (60 days) of little to no rainfall during the growing season are common.

## Recreational uses

Recreational uses include hunting, hiking, camping, equestrian, and bird watching.

## Wood products

Honey mesquite, juniper (cedar), and some oak are used for posts, firewood, charcoal, and other specialty wood products.

## Other products

Hay, seed from native grasses, forbs, and legumes.

## 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

## 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.

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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:** Rills are not uncommon for this site. Extent is influenced by length of slope.  

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- 2. Presence of water flow patterns:** Water flow patterns are common due to topography and landscape position.  

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- 3. Number and height of erosional pedestals or terracettes:** Occasional low pedestals or terracettes are expected in association with rills and water flow areas.  

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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 30 percent bare ground randomly distributed.  

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- 5. Number of gullies and erosion associated with gullies:** Some gullies should be expected but should be vegetated and stable.  

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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):** Small to medium-sized litter will move short distances during 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 40 to 60 inches thick with colors from olive gray to dark grayish brown and weak fine, medium fine and moderate blocky structures. SOM is less than 1.0 percent.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This prairie site is dominated by tallgrasses and forbs. With adequate litter and little bare ground, this site provides for maximum infiltration and little runoff under normal rainfall events.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.
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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 > Cool-season grasses >
- Other: Warm-season forbs > Trees > Shrubs/Vines
- 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.
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14. **Average percent litter cover (%) and depth ( in):**
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,800 pounds per acre for below average moisture years to 4,800 pounds per acre for above average moisture years.
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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:** Potential invasive species include yellow bluestems, common Bermudagrass, mesquite, elm, huisache, eastern red cedar, hackberry, osage orange and McCartney rose.



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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.
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