Ecological site R085AY189TX
Very Shallow 30-38" PZ

Last updated: 9/21/2023
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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): 085A–Grand Prairie

The Grand Prairie MLRA is characterized by predominately loam and clay loam soils underlain by limestone and shale. Topography transitions from steeper ridges and summits of the Lampasas Cut Plain on the southern end to the more rolling hills of the Fort Worth Prairie to the north. The Arbuckle mountain area in Oklahoma is also within this MLRA.

Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA Ag Handbook 296.

Ecological site concept

This site occurs on shallow gravelly soils over caliche or limestone. The reference vegetation consists of native midgrasses and forbs with very few shrubs. These sites can be very sensitive to drought conditions due to the low water holding capacity of the soils. In the absence of fire or other brush management, woody species such as ashe juniper may increase on the site.

Associated sites

R085AY179TX	**Clayey Slope 30-38** This site has soils having greater depth, usually >40”, than the Very Shallow site.
R085AY185TX	**Shallow 30-38" PZ** This site has soils having greater depth, usually 10 – 20 inches, than the Very Shallow site.

Similar sites

R085BY098OK	**Very Shallow 38-42 PZ** Very shallow site in the Arbuckle Uplift portion of MLRA 85.
R085AY563TX	**Shallow Clay 30-38" PZ** Shallow clay soils

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Bouteloua curtipendula* (2) *Tridens muticus*

Physiographic features

This site occurs on interfluves and crests of hillslopes in the Grand Prairie. This site is characteristically a water shedding site. Slopes are typically less than 12 percent.

Table 2. Representative physiographic features

Landforms	(1) Hills > Ridge (2) Hills > Hill
Runoff class	High to very high
Ponding frequency	None
Elevation	500–1,900 ft
Slope	1–12%
Aspect	Aspect is not a significant factor

Climatic features

The climate is subhumid subtropical and is characterized by hot summers 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. The average first frost should occur around November 5 and the last freeze of the season should occur around March 19.

The average relative humidity in mid-afternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 75 percent of the time possible during the summer and 50 percent in winter. The prevailing wind direction is from the south and highest windspeeds occur during the spring months.

Approximately two-thirds of annual rainfall occurs during the April to September period. Rainfall during this period generally falls during thunderstorms, and fairly large amounts of rain may fall in a short time. The driest months are usually July and August.

Table 3. Representative climatic features

Frost-free period (characteristic range)	194-208 days
Freeze-free period (characteristic range)	216-243 days
Precipitation total (characteristic range)	32-38 in
Frost-free period (actual range)	190-209 days
Freeze-free period (actual range)	209-245 days
Precipitation total (actual range)	31-39 in
Frost-free period (average)	201 days
Freeze-free period (average)	230 days
Precipitation total (average)	35 in

Climate stations used

- (1) BENBROOK DAM [USC00410691], Fort Worth, TX

- (2) CLEBURNE [USC00411800], Cleburne, TX
- (3) WHITNEY DAM [USC00419715], Clifton, TX
- (4) DENTON MUNI AP [USW00003991], Ponder, TX
- (5) DECATUR [USC00412334], Decatur, TX
- (6) EVANT 1SSW [USC00413005], Evant, TX
- (7) LAMPASAS [USC00415018], Lampasas, TX
- (8) BROWNWOOD 2ENE [USC00411138], Early, TX

Influencing water features

This site is not influenced by water from wetlands or streams. While this site may receive some run off from adjacent sites upslope, it also sheds water to sites down slope. In reference condition, the presence of midgrasses should allow for infiltration into the soil. However, water holding capacity may be low due to the shallow gravelly soils.

Wetland description

NA

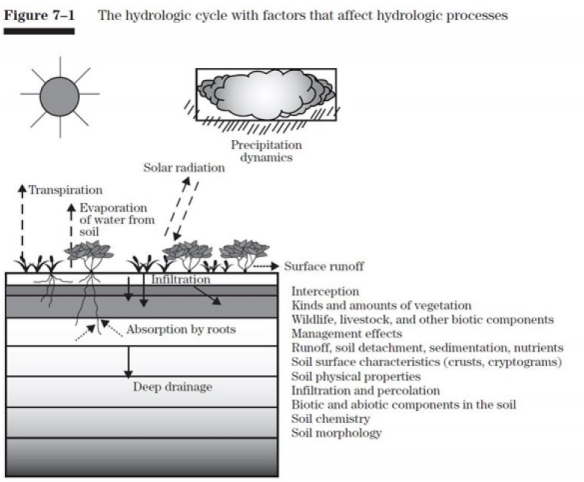


Figure 8.

Soil features

Representative soil components for this ecological site include: Maloterre

These soils are very shallow, somewhat excessively drained, moderately slow permeable soils that formed in residuum weathered from limestone.

Table 4. Representative soil features

Parent material	(1) Residuum–limestone (2) Residuum–mudstone
Surface texture	(1) Gravelly clay loam (2) Gravelly loam (3) Very gravelly clay loam (4) Very gravelly loam (5) Clay loam (6) Loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to moderate
Soil depth	3–10 in
Surface fragment cover <=3"	5–50%

Surface fragment cover >3"	0–10%
Available water capacity (0-40in)	0–1 in
Calcium carbonate equivalent (0-40in)	40–80%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	10–60%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The reference plant community for the Very Shallow site is a midgrass prairie. The grasses that are most commonly occurring are sideoats grama (*Bouteloua curtipendula*), silver bluestem (*Bothriochloa laguroides*), slim tridens (*Tridens muticus*), rough tridens (*Tridens muticus* var. muticus) and tall dropseed (*Sporobolus compositus*). Smaller amounts of little bluestem (*Schizachyrium scoparium*) is also present. The very shallow clay loam textured soils over limestone bedrock in a rainfall regime of 30 to 38 inches favors a midgrass prairie community. Up to one third of the site may have soil so thin that only short lived annuals are present. Very few shrubs and trees were present on this site, historically. The woody component consisted of live oak (*Quercus fusiformis*), Texas red oak (*Quercus buckleyi*), elm species (Ulmus spp.), plum species (Prunus spp.), hackberry (*Celtis occidentalis*) and bumelia (*Sideroxylon lanuginosum*). Both buffalo impact and fires were dominant forces to maintain the historic midgrass prairie. Large herds of buffalo would intensely graze this site and then not come back for many months or even years, usually following the burned areas. Animal impacts were a key to maintaining the open midgrass prairie. Large concentrated buffalo herds along with fires that occurred frequently enough to kill seedlings, prevented the woody plant encroachment.

To a large extent the way the site changes and how fast the site evolves depends on the location in relation to the edges of the MLRA and adjacent woody vegetation. Generally, sites located within a short distance to other brush encroached areas tend to change in the absence of fire toward a mesquite/juniper brushland community fairly rapid once the woody plants start while sites located further away would take longer to shift into a different plant community. Woody plants have increased over the past 100 to 150 years on virtually all of the shallow sites located nearest the breaks. Where there is a seed source close by, Ashe juniper (*Juniperus ashei*) and eastern redcedar (*Juniperus virginiana*) will readily invade the site. The juniper first occurs under fences, trees and other places where songbirds tend to rest. In many areas, juniper has become a significant invasive species, especially if prescribed burning is not used. The grasses are palatable and nutritious and the site provides year round grazing. The most limiting soil factor is soil depth. In very dry periods, the soils can appear rather droughty. When good rainfall is received, the site produces well.

Climate and soils are the most important and limiting factors affecting grass vegetation on the site. However, fire played a role in the ecology of the site as is true for most of the grasslands. The main effect of fire on this site was to suppress woody shrubs and cacti. The fires of pre-settlement days were probably more severe due to more fuel being available leading to more damaging to woody plants. The grass species such as little bluestem, big bluestem (*Andropogon gerardii*) and Indiangrass (*Sorghastrum nutans*) are considered fire neutral as far as their response to fire. Fire stimulated forbs growth if the timing was right and usually creates more plant diversity in this site for one or two years post-burn. Then the grasses tend to crowd out the forbs and plant diversity decreases. Forbs also need spring moisture which is perhaps the major triggering factor. Prescribed fire is sometimes used as a tool to promote plant diversity, mainly for wildlife. Fire will usually not produce much mortality in older, resprouting, woody plants. After brush has been chemically or mechanically controlled, fire can be used effectively to suppress re-growth. Small juniper less than 3 feet in height can be easily killed by fire. Fuel loads are often the most limiting factor for the effective use of prescribed burning on this site. Once woody plants become mature (larger) or form dense stands,

the use of fire is limited. Woody plant suppression using safe approved herbicides or mechanical treatment is generally more practical, with prescribed playing a role as follow-up.

With abusive grazing practices, the vigorous sideoats grama will become lower in vigor while the secondary successional species such as silver bluestem and slim tridens will begin to increase along with an increase of encroaching woody plants. Little bluestem is tolerant of some fairly heavy grazing for long periods. At some point, a threshold is crossed and the ground cover is opened up resulting in bare places where weedy species become established. Western ragweed (*Ambrosia psilostachya*), crotons (*Croton capitatus*) and cool-season annuals will quickly increase on the site when the primary grass species are in a weakened condition. The seeds of many woody species are consumed by birds and when passed through the digestive system and excreted in their droppings. This serves as an excellent seedbed and the seeds readily establish. Grazing management alone probably has minimal effect on the proliferation of woody plants, but a good cover of perennial grasses likely provides shading and minimizes the seed to soil contact the mesquite beans need to be allowed to become established. Prescribed fire provides a much better method to control the spread of woody plants. Selective individual plant removal of mesquite and/or juniper is simple and economical when plants are just beginning to show up on the site. When the rapid increase of number of plants occur, the number of woody plants per acre will soon become too numerous for individual plant treatment (IPT) to be feasible. Prescribed grazing with a moderate stocking rate can sustain the grass species composition and maintain annual production near reference levels. The very shallow site can be abused to the point that the perennial warm-season grasses thin out and the lower successional grasses along with annual grasses and forbs begin to dominate. This process of degradation usually takes many years and is further exacerbated by summer drought and above average winter moisture.

Long term droughts that occur only three to four times in a century can effect some change in historic plant communities when coupled with abusive grazing. Short-term droughts are common in the area and usually do not have a lasting effect in changing stable plant communities, although annual production can be affected. When a brush canopy becomes established which shades the ground sufficiently, this canopy cover tends to favor cool-season annual species. Once a state of brush and cool-season annuals is reached, recovery to a good perennial warm-season grass cover is unlikely without major input with brush management and range planting.

In summary, the change in states of vegetation depend on the type of grazing management applied over many years, and the rate of invasion and establishment of woody species. The effects of seasonal moisture and short term dry spells become more pronounced after the site crosses thresholds to a lower ecological condition. Plant communities that consist of warm-season perennial grasses such as little bluestem and the associated species of the reference community are able to persist and withstand climatic extremes with only minor shifts in the overall plant community.

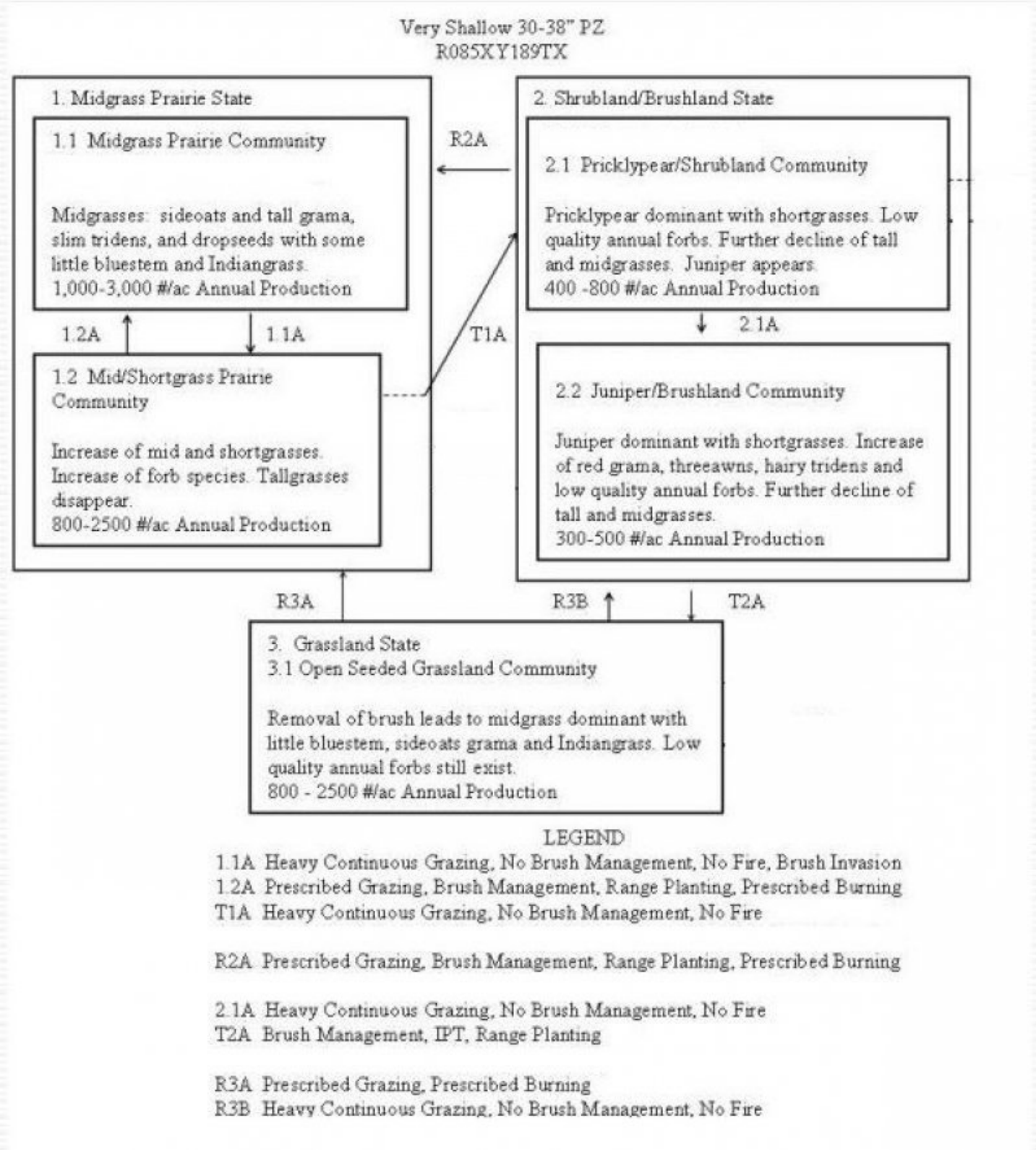
Historically, the site was basically inhabited by grassland wildlife species such as bison, deer, grassland birds and small mammals for a part of their habitat needs. Over the years, as the site has changed to a more mixed grass and shrub community, different wildlife species utilize the site for habitat purposes. Woody plants provide cover for white-tailed deer and bobwhite quail. These wildlife species have both increased along with the brushy plants due to the cover that these plants provide. More forbs are needed to meet these species food requirements and woody plants for browse are important for deer. It is often the objective of many land owners to strike a balance in plant community so that these wildlife species can exist along with domestic livestock. This can be accomplished by a carefully planned grazing and brush management program. It must be realized that managing at a lower successional level may meet some wildlife species requirements very well, but may not be nearly as productive for grazing purposes. The lower successional level may not be as capable of satisfying functions such as nutrient cycling, hydrologic protection, plant community stability or soil protection as well. A proper compromise can be achieved with careful conservation planning that considers all resources as well as goals and objectives set by the land owner.

State and Transitional Pathways: Narrative

The following diagram suggests some pathways that the vegetation on this site might take in response to various treatment or natural stimuli over time. There may be other states or plant communities that are not shown on this diagram. This information is to show that changes in plant community can occur due to management and natural factors and can be changed by implementing certain conservation practices. The plant communities described are commonly observed for this site. Before making plans for plant community manipulation for specific purposes, landowners should consult local professionals for assistance.

Plant community changes are due to many factors. Change may occur slowly or in some cases, fairly rapidly. As vegetative changes occur, certain thresholds are crossed. This means that once a certain point is reached during the transition of one community to another, a return to the first state or previous plant community may not be possible without the input of some form of energy and expense. This often means intervention with practices that are not part of natural processes. An example might be the application of herbicide or mechanical treatment to control some woody species in order to reduce its population and encourage more grass and forbs growth. Merely adjusting grazing practices would probably not accomplish any significant change in a plant community once certain thresholds are crossed. The amount of energy required to effect change in community would depend on the present vegetative state and the desired vegetative state.

State and transition model



State 1
Midgrass Prairie State - Reference

Dominant plant species

- sideoats grama (*Bouteloua curtipendula*), grass

Community 1.1
Midgrass Prairie Community

Figure 9. 1.1 Midgrass Prairie Community

The interpretive plant community for this site is the midgrass prairie community (1.1). The community is dominated by warm-season perennial midgrasses such as sideoats grama, silver bluestem and slim tridens. Little bluestem is present where cracks in the rock permit deep root growth. Perennial forbs such as sunflowers, prairie clovers, bundleflowers, and daleas are well represented throughout the community. This plant community evolved with a short duration of heavy use by large herbivores followed by long rest periods due to herd migration following occasional fire. With heavy grazing pressure and the removal of fire, this plant community will change into a Midgrass/Shortgrass Prairie Community (1.2), a Pricklypear/Shrubland Community (2.1) or Mesquite/Juniper Brushland Community (2.2). The changes within the grassland communities can change fairly rapid while the communities having an increase of woody plants are somewhat slower.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	900	1800	2700
Forb	100	200	300
Shrub/Vine	0	0	0
Tree	0	0	0
Total	**1000**	**2000**	**3000**

Figure 11. Plant community growth curve (percent production by month). TX6012, Midgrass Prairie. Midgrass Prairie with increase of forbs, shrubs, and trees (5% canopy)..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	2	18	23	17	6	4	16	6	3	2

Community 1.2
Midgrass/Shortgrass Prairie Community

Figure 12. 1.2 Midgrass/Shortgrass Prairie Community

This transition state occurs with yearlong grazing and without fire or brush management. The sideoats grama will start to disappear from the plant community. Invader brush species (mesquite, juniper, pricklypear, etc.) appears on-site and becomes established. Cedar elm (*Ulmus crassifolia*), bumelia (*Sideroxylon lanuginosum*), and hackberry (Celtis spp.) also start to increase. Texas wintergrass (*Nassella leucotricha*) increases as brush canopy increases. The plant community consists of less than 10 percent canopy of woody plants. Continuous grazing by domestic livestock has accelerated the shift towards the Shrubland/Brushland State (2.1 and 2.2). The Midgrass/Shortgrass prairie community (1.2) can revert back to the Midgrass prairie (1.1) with prescribed burning and/or prescribed grazing. Without prescribed burning and/or prescribed grazing, this plant community would continue to shift toward the Pricklypear/Shrubland Community (2.1) or Messquite-Juniper/Brushland Community (2.2).

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	640	1320	2000
Forb	160	330	500
Shrub/Vine	0	0	0
Tree	0	0	0
Total	**800**	**1650**	**2500**

Figure 14. Plant community growth curve (percent production by month). TX6017, Midgrass/Shortgrass Prairie Community. Midgrasses and Shortgrasses dominate the site with forbs and less than ten percent woody canopy..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	2	18	23	17	6	4	16	6	3	2

Pathway 1.1A
Community 1.1 to 1.2

Midgrass Prairie Community → **Midgrass/Shortgrass Prairie Community**

With heavy continuous grazing pressure, no brush management, no fires, and invasion of brush species, the Midgrass Prairie Community shifts to the Mid/Shortgrass Prairie Community.

Pathway 1.2A
Community 1.2 to 1.1

Midgrass/Shortgrass Prairie Community

Midgrass Prairie Community

With the application of various conservation practices such as Prescribed Grazing, Brush Management, Range Planting, and Prescribed Burning, the Mid/Shortgrass Prairie Community can revert back to the Midgrass Prairie Community.

Conservation practices

Brush Management
Prescribed Burning
Range Planting
Prescribed Grazing

State 2
Shrubland/Brushland State

Dominant plant species

- Ashe's juniper (*Juniperus ashei*), tree
- buffalograss (*Bouteloua dactyloides*), grass

Community 2.1
Pricklypear/Shrubland Community

Figure 15. 2.1 Pricklypear/Shrubland Community

The Pricklypear/Shrubland Community (2.1) consists of midgrasses with 10 to 20 percent pricklypear canopy and other woody plants. The soils of this site are underlain with hard unfractured limestone. As this community progresses, prickly pear continues to invade the site along with other woody plants. Warm-season perennial tallgrasses such as Indiangrass and switchgrass have all but disappeared. Brush canopy continues to increase dramatically from the reference plant community. Texas wintergrass, three-awn species (Aristida spp.) and annual grasses continue to increase. Continuous grazing by domestic livestock has accelerated the vegetative shift towards the Juniper/Brushland Community (2.2). The shift to this plant community has occurred due to the absence of fire or other means of brush suppression coupled with abusive grazing. The grass species that dominate the site are mostly annuals and cool-season species. This Pricklypear/Shrubland community (3) can be reverted back to near historic condition by some means of brush suppression and good grazing management. Without this type of

treatment on this plant community, the site will continue to shift toward more dense stands of cactus.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Forb	200	300	400
Grass/Grasslike	200	300	400
Shrub/Vine	40	60	80
Tree	40	60	80
Total	**480**	**720**	**960**

Figure 17. Plant community growth curve (percent production by month). TX6013, Prickly pear/Shrubland Community. Midgrasses with pricklypear canopy that exceeds ten percent..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	8	20	25	20	5	3	10	4	1	1

Community 2.2
Mesquite/Juniper Brushland Community

Figure 18. 2.2 Mesquite/Juniper Brushland Community

This plant community is a brushland community (greater than 10% canopy) dominated by mesquite and/or juniper. Pricklypear cactus may also be present. Other species present in small amounts are cedar elm and hackberry. The herbaceous understory is almost nonexistent. Shade tolerant species such as Texas wintergrass tends to dominate the site where mesquite is the major woody species. The soils of this state are underlain with fractured limestone. When the canopy of juniper increases toward a cedar breaks type community, most grasses have almost disappeared. Continuous grazing by domestic livestock has continued to accelerate the shift towards denser brush. The midgrass prairie can be restored by prescribed burning but will require many years of burning due to light fuel load of fine fuel and the absence of seed sources. Chemical control alone is usually a good option for treatment on a large scale. Mechanical treatment of this site along with range planting is generally not a good option due the nature of the very shallow rocky soil. Due to the presence of dense canopy of mesquite and juniper, the amount of grass cover is greatly reduced. This, in turn, reduces forage production.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	135	180	225
Forb	75	100	125
Tree	45	60	75
Shrub/Vine	45	60	70
Total	**300**	**400**	**495**

Figure 20. Plant community growth curve (percent production by month). TX6014, Mesquite/Juniper/Brushland Community. Consist of mixed grasses with greater than 50 percent canopy of woody plants..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	8	20	25	19	5	3	10	4	1	1

Pathway 2.1
Community 2.1 to 2.2

Pricklypear/Shrubland Community

Mesquite/Juniper Brushland Community

With heavy continuous grazing, no brush management, and no fires, the Pricklypear/Shrubland Community would shift to the Juniper/Brushland Community.

State 3
Grassland State

Dominant plant species

- yellow bluestem (*Bothriochloa ischaemum*), grass

Community 3.1
Open Seeded Grassland Community

Figure 21. 3.1 Open Seeded Grassland Community

This state is usually the result of applying mechanical brush control and range planting using one or more introduced grass species. Native species may be a part of the seed mixture but a significant amount of a vigorous introduced species is included. Such introduced species include: Kleingrass (*Panicum coloratum*) or one of the Old

world bluestems (Bothriochloa spp.) such as King Ranch (KR) bluestem (*Bothriochloa ischaemum*), WW-Spar (*Bothriochloa ischaemum*), WW-B Dahl (*Bothriochloa bladhii*) or T-587 (Diachanthium spp.). All of these have been planted on this site as well as coastal bermudagrass (*Cynodon dactylon*). Coastal bermudagrass does not do well on this site.

Table 9. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	680	1400	2125
Forb	80	170	250
Shrub/Vine	25	50	75
Tree	15	30	50
Total	**800**	**1650**	**2500**

Figure 23. Plant community growth curve (percent production by month). TX6015, Open Seeded Grassland Community. This state is usually the result of mechanical brush control and reseeding using one or more native grass species..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	2	18	23	17	6	4	16	6	3	2

Transition T1A
State 1 to 2

With heavy continuous grazing, no brush management, and no fires on a landscape having hard limestone bedrock, the Midgrass Prairie State would shift to the Shrubland State.

Restoration pathway R2A
State 2 to 1

The Shrubland State could revert back to the Midgrass Prairie State through the implementation of various conservation practices such as Prescribed Grazing, Brush Management, and Range Planting.

Transition T2A
State 2 to 3

The Shrubland State shifts to the Grassland State with the application of conservation practices such as Brush Management, Individual Plant Treatments, and Range Planting.

Restoration pathway R3A
State 3 to 1

With Prescribed Grazing and Prescribed Burning, the Grassland State can be reverted to the Midgrass Prairie State.

Conservation practices

Prescribed Burning
Prescribed Grazing

Transition T3A
State 3 to 2

The Grassland State can shift back to the Shrubland State through heavy continuous grazing, no brush management, and no fires.

Additional community tables

Table 10. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Tallgrass**			100–300	
	little bluestem	SCSC	*Schizachyrium scoparium*	100–300	–
2	**Midgrass**			500–1500	
	sideoats grama	BOCU	*Bouteloua curtipendula*	500–1500	–
3	**Midgrasses**			150–450	
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	50–450	–
	composite dropseed	SPCOC2	*Sporobolus compositus var. compositus*	50–450	–
	slim tridens	TRMU	*Tridens muticus*	50–450	–
4	**Shortgrasses**			100–300	
	purple threeawn	ARPUP9	*Aristida purpurea var. perplexa*	20–300	–
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	20–300	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	20–300	–
	tall grama	BOHIP	*Bouteloua hirsuta var. pectinata*	20–300	–
	buffalograss	BODA2	*Bouteloua dactyloides*	20–150	–
5	**Mid/Shortgrasses**			50–150	
	fall witchgrass	DICO6	*Digitaria cognata*	25–150	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	25–150	–
6	**Midgrasses**			0–1	
	Texas cupgrass	ERSE5	*Eriochloa sericea*	0–1	–
	seep muhly	MURE2	*Muhlenbergia reverchonii*	0–1	–
	vine mesquite	PAOB	*Panicum obtusum*	0–1	–
	Drummond's dropseed	SPCOD3	*Sporobolus compositus var. drummondii*	0–1	–
Forb					
7	**Forbs**			100–300	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–300	–
	white sagebrush	ARLUM2	*Artemisia ludoviciana ssp. mexicana*	0–300	–
	yellow sundrops	CASE12	*Calylophus serrulatus*	0–300	–
	American star-thistle	CEAM2	*Centaurea americana*	0–300	–
	whitemouth dayflower	COER	*Commelina erecta*	0–300	–
	croton	CROTO	*Croton*	0–300	–
	prairie clover	DALEA	*Dalea*	0–300	–
	purple prairie clover	DAPU5	*Dalea purpurea*	0–300	–
	Illinois bundleflower	DEIL	*Desmanthus illinoensis*	0–300	–
	blacksamson echinacea	ECAN2	*Echinacea angustifolia*	0–300	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	0–300	–
	Leavenworth's eryngo	ERLE11	*Eryngium leavenworthii*	0–300	–

	snow on the mountain	EUMA8	*Euphorbia marginata*	0–300	–
	beeblossom	GAURA	*Gaura*	0–300	–
	hoary false goldenaster	HECA8	*Heterotheca canescens*	0–300	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	0–300	–
	bluet	HOUST	*Houstonia*	0–300	–
	coastal indigo	INMI	*Indigofera miniata*	0–300	–
	trailing krameria	KRLA	*Krameria lanceolata*	0–300	–
	dotted blazing star	LIPU	*Liatris punctata*	0–300	–
	Nuttall's sensitive-briar	MINU6	*Mimosa nuttallii*	0–300	–
	yellow puff	NELU2	*Neptunia lutea*	0–300	–
	cobaea beardtongue	PECO4	*Penstemon cobaea*	0–300	–
	groundcherry	PHYSA	*Physalis*	0–300	–
	snoutbean	RHYNC2	*Rhynchosia*	0–300	–
	rhynchosida	RHYNC5	*Rhynchosida*	0–300	–
	blackeyed Susan	RUHI2	*Rudbeckia hirta*	0–300	–
	pitcher sage	SAAZG	*Salvia azurea var. grandiflora*	0–300	–
	compassplant	SILA3	*Silphium laciniatum*	0–300	–
	false gaura	STLI2	*Stenosiphon linifolius*	0–300	–
	white heath aster	SYERE	*Symphyotrichum ericoides var. ericoides*	0–300	–
Shrub/Vine					
8	**Shrubs/Vines**			0–1	
	catclaw acacia	ACGR	*Acacia greggii*	0–1	–
	stretchberry	FOPU2	*Forestiera pubescens*	0–1	–
	fragrant sumac	RHAR4	*Rhus aromatica*	0–1	–
	winged sumac	RHCO	*Rhus copallinum*	0–1	–
Tree					
9	**Trees**			0–1	
	hackberry	CELTI	*Celtis*	0–1	–
	plum	PRUNU	*Prunus*	0–1	–
	Texas live oak	QUFU	*Quercus fusiformis*	0–1	–
	bully	SIDER2	*Sideroxylon*	0–1	–
	Hercules' club	ZACL	*Zanthoxylum clava-herculis*	0–1	–

Animal community

The historic midgrass prairie was habitat to migratory bison herds. Deer and turkey were mostly found along the wooded streams occasionally feeding on the open prairie. Large predators such as wolves, coyotes, mountain lions and black bear roamed throughout the area. White-tail deer, turkey, bobcats and coyotes along with resident and migratory birds and small mammals can find suitable habitat today. Domestic livestock is the dominant contemporary grazer of the site. As the prairie changes through the various vegetative states towards the brushland state, the quality of the habitat may improve for some species and decline for others. Appropriate management practices must be applied to maintain a vegetative state in optimum habitat quality for the desired animal species.

Hydrological functions

Hydrologically, the site contributes runoff to the various draws, creeks, and streams that are common in the MLRA.

If the perennial grass cover is maintained in good vigor, then maximum infiltration occurs and runoff is reduced. More water getting into the ground means a healthier, more productive plant community. Due to the shallow soil underlain with limestone, there is limited deep infiltration and during periods of low water use by plants there are numerous seeps. If infiltration is minimal, then the effect is an artificially shallow soil with plant roots retreating to near the soil surface. More perennial grass cover means less runoff may result; but the runoff that does occur is less laden with sediment. Overall watershed protection is enhanced by a healthy grassland community, as is nutrient cycling.

Peak rainfall periods occur in April, May, June, September and October. Rainfall amounts may be high (3 to 10 inches per event) and events may be intense. The soils of this site are shallow and the water holding ability is limited. Periods of 60 plus days of little or no rainfall during the growing season are common. During periods of good rainfall with good grass cover water infiltrates to the limestone rock below and moves to lower elevations and emerges as seeps and springs. The hydrology of this site may be manipulated with 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 favors ground water recharge. Potential movement of soil (erosion), pesticides and both organic and inorganic nutrient applications (fertilizer) should always be considered when managing for higher volumes of surface runoff.

Recreational uses

Hunting, hiking, camping, equestrian, bird watching and off road vehicle use are various recreational uses for the site.

Wood products

None.

Other products

None.

Other information

None.

Inventory data references

Information presented here has been derived from NRCS clipping data and field observations of range trained personnel: James Luton RMS, Montague; William Donham, DC, Weatherford; Kent Ferguson RMS, Weatherford; Dan Caudle

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Acknowledgments

Site Development and Testing Plan:

Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document. Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

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)	Lem Creswell, Zone RMS, NRCS, Weatherford, Texas
Contact for lead author	817-596-2865.
Date	11/01/2005
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None. This site does not usually develop rills due to shallow depths.

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2. **Presence of water flow patterns:** None. This site rarely has follow patterns due to shallow soil depth and surface rocks. Some patterns are expected around surface obstacles.

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3. **Number and height of erosional pedestals or terracettes:** None. Some minor pedestalling may occur in the shallower, lower productiion portions of the site. Rarely should they be over 1/4 inch height.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 5 to 10 percent. Small and non-connected areas.

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5. **Number of gullies and erosion associated with gullies:** None. This site does not develop gullies due to shallow soils

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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):** Minimal and short. Less than 6 inches. Only associated with water flow patterns following extremely high intensity rainfall.

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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):** Stability class ranges from 4 to 6 for both canopy and interspaces.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Dark grayish brown clay loam surface with subrounded to angular pebbles, cobbles and stones. Thickness is about 7 inches. Soil organic matter is 1 to 4 percent.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** High grass canopy and basal cover with very small gaps between plants reduces rainfall impact and slows runoff providing increased time for infiltration. High vegetative cover on this site will result in more water being retained in the soil for platn growth.

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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 >

Other: Warm-season shortgrasses > forbs = cool-season grasses > trees > shrubs/vines

Additional:

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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 dominantly herbaceous.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1000 to 3000 pounds acre. 1000 pounds in below average moisture years, 2000 in "normal" moisture years and 3000 pounds in above average moisture year.

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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:** Mesquite, juniper and pricklypear are the primary invaders.

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