USDA Natural Resources Conservation Service

Ecological site R078BY081TX
Loamy Upland 19-26" PZ

Last updated: 9/15/2023
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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.

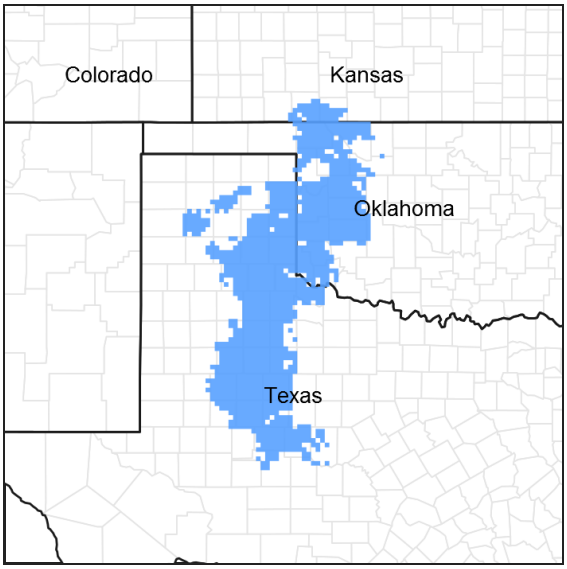


Figure 1. Mapped extent

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): 078B–Central Rolling Red Plains, Western Part

MLRA 78B is characterized by strongly dissected, rolling plains with prominent ridges and valleys and rolling to steep irregular topography. Loamy soils are generally well drained, range from shallow to deep, and developed in sediments of Triassic and Permian age.

LRU notes

NA

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

These sites occur on moderately deep soils on uplands. Reference vegetation includes tallgrasses with midgrasses, forbs and few shrubs. Abusive grazing practices may lead to a shift in the plant community and a decline in the

more palatable tallgrass species. Without fire or alternative brush management, woody species may increase on the site.

Associated sites

R078BY080TX	**Loamy Bottomland 19-26" PZ** Deep loamy soils on floodplains
R078BY084TX	**Rough Breaks 19-26" PZ** Shallow soils on breaks
R078BY090TX	**Shallow Clay 19-26" PZ** Shallow clay soils on uplands
R078BY072TX	**Clay Loam 19-26" PZ** Deep clay loam soils on uplands
R078BY076TX	**Gyp 19-26" PZ** Shallow soils over Gypsum

Similar sites

R078CY056OK	**Loamy Upland** Loamy Upland site in 78C

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Schizachyrium scoparium* (2) *Andropogon hallii*

Physiographic features

This site occurs as convex, gently sloping ridgetops in conjunction with long, moderately steep slopes, small canyons and draw bottoms. It is a rolling upland site with moderate to steep slopes with ongoing geologic erosion.

Table 2. Representative physiographic features

Landforms	(1) Plains > Hillslope (2) Plains > Hill
Runoff class	Negligible to medium
Flooding frequency	None
Ponding frequency	None
Elevation	457–1,006 m
Slope	0–30%
Ponding depth	0 cm
Water table depth	0 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of the western rolling plains is dry, sub-humid with hot summers and mild winters. Temperatures often reach 100 degrees F for several consecutive days during summer. Cold spells with temperatures less than 20 degrees F only last short periods of time. The soil is not frozen below the 3-inch depth for more than 2 to 3 days. Humidity is low during the winter and early spring months. Sometimes relative humidity is high enough to make summer days seem uncomfortable. Most of the precipitation comes in the form of rain and that in the spring and

early summer principally. May is the wettest month followed by June. July and August are dryer and much hotter. Rainfall often comes as intense showers of relatively short duration. Rainfall rate per hour is often high and runoff is significant. Infiltration is diminished due to lack of opportunity time. The growing season begins in April and ends with the first killing frost in November. There is little snowfall with the average being about 10 inches. Rainfall averages about 22 inches.

There is a 70% chance that yearly precipitation will fall between 16 and 24 inches. About 55% of the time, the yearly rainfall is below the mean. Dry spells during the growing season are common and long-term droughts occur in cycles of about 20 years. Native vegetation is principally warm season.

Table 3. Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	225 days
Precipitation total (average)	660 mm

Influencing water features

These are upland sites with moderate to moderately steep slopes. Runoff is from moderate to rapid. Water moves down the slopes and into drainages which are small canyons or draws. Percent runoff in relation to infiltration is high. If cover is adequate, erosion rates are still moderately high on the steep terrain. If inadequate vegetative cover is present, sheet and gully erosion becomes excessive and sedimentation downstream is significant. These sites may become droughty without sufficient cover to allow for proper infiltration to occur.

Wetland description: This site is not a wetland and no wetlands are associated with it.

Wetland description

NA

Soil features

The soils of the loamy prairie site are moderately shallow to deep reddish loams, silt loams and very fine sandy loams. The silt content of these soils is relatively high. The slopes vary from as little as 3% on the convex ridgetops and draw bottoms to as much as 20% on the slopes. Runoff is rapid on the steeper slopes and moderate on the more gently slopes. The soils are moderately permeable and have from moderately low to moderate water holding capacity.

Fertility is from low to moderate. Gypsum content of the soils averages about 2-3%. Bands of gypsum are often found in the exposed walls of drainages. Some gypsum fragments are sometimes found on the surface. The water erosion potential is high when cover is poor. Gullies are common. Geologic erosion is evident. This site occurs in the western Rolling Plains of Texas and Oklahoma. These soils are classified as Typic Haplustepts.

Major Soil Taxonomic Units correlated to this site include: Woodward, Quinlan, and Obaro soils series with loam, silt loam, and very fine sandy loam variations.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and siltstone (2) Colluvium–sandstone and siltstone
Surface texture	(1) Loam (2) Sandy loam (3) Very fine sandy loam
Family particle size	(1) Loamy

Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	51–203 cm
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	8.89–21.59 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–8%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The reference plant community for this site is tallgrass and midgrass communities along with a good forb component and a few shrubs. The vegetation on the slopes is little bluestem (*Schizachyrium scoparium*) dominant with some smaller amounts of Indiangrass (*Sorghastrum nutans*), sand bluestem (*Andropogon gerardii*) and sideoats grama (*Bouteloua curtipendula*). The vegetation on the convex ridgetops is sideoats grama, blue grama (*Bouteloua gracilis*), and a smaller amount of little bluestem. The draws and canyon bottoms are similar to the slopes but generally have slightly more Indiangrass present. The warm-season grasses are C-4 metabolism plants, while the cool-season grasses have C-3 metabolism.

Soil and slope affect vegetation more than other factors. The soil on the ridgetops tends to be deeper and less erosion has occurred over time. There is usually less calcium carbonate present in the surface layer than in the same soil series on the slopes. The more calcium carbonate present, the more little bluestem usually found. The high gyp content of the soils also favors little bluestem. The ridgetops have always been subject to more grazing pressure, even when bison were the primary grazers. Even on the best managed ranches, this distinction in plant communities can be seen.

Fire has played a major role in the development of the plains grassland region. The taller grass species, especially sand bluestem (*Andropogon hallii*), Indiangrass, and little bluestem respond very positively to occasional fire. The midgrasses and shortgrasses are more fire neutral in response. Shrubs were damaged by fire and thereby are kept in check. It is difficult for shrubs to compete with thick stands of tallgrasses and the fuel loads for fire were such that fires were more damaging to woody plants in pre-settlement times. Most grassland ecologists speculate that fires occurred perhaps every 7 to 12 years on the average. Fire frequency varied of course with the random way fires occurred. Tallgrasses benefited by having old growth removed that had built up in good rainfall years. Old plants that were becoming moribund were replaced by younger plants and the nutrient cycling process was enhanced. Diversity was increased as the fire stimulated forb growth. Wildlife came to the burned areas and grazed the fresh vegetative growth. Shrubs resprouted and offered higher quality browse. Fire helped to maintain plant community balance in keeping with the sites capabilities.

Climatic fluctuations affect annual vegetative production from year to year. Generally speaking, plant communities developed in this fluctuating set of conditions and have adapted to them. The possible exception is that of serious long term drought which occur at times, perhaps only two or three times in a century. Long-term drought (those lasting greater than 5 years) along with abusive grazing may effect plant community balance to such a degree that the former vegetative state may not be quick to be restored.

Grazing distribution is difficult to achieve on this site. The topography limits accessibility and the slopes and dissecting draws affect livestock movement. The ridgetops receive a greater share of grazing pressure. This is true today and was likely true when bison were the principal grazers. The slopes are often in better condition ecologically due to more limited grazing pressure. Abusive grazing is first noticed on the ridgetops and draw bottoms. With abusive grazing, the tallgrasses decrease and sideoats grama and blue grama increase in community makeup. Reference community forbs also decline and woody shrubs begin to become more numerous. Sand sagebrush (*Artemisia filifolia*) and mesquite (*Prosopis glandulosa*) both tend to increase with heavy grazing. Mesquite tends to occur more on the ridgetops and sage on the slopes. If the grazing abuse is long-term, then grasses like sand dropseed (*Sporobolus cryptandrus*), perennial threeawn (Aristida spp.), and buffalograss (*Bouteloua dactyloides*) will become more and more prevalent and the sideoats grama will decrease to only a token amount. With further abuse, western ragweed (*Ambrosia psilostachya*) and various annual forbs will become prolific. The blue grama will remain but will become sod bound and very low producing. Once in this degraded state, it is doubtful that a community similar to the reference would be possible to restore, and certainly not with management alone.

The hydrologic function of the site is critically dependent upon the tall and midgrass cover that typifies the reference community. This site yields a good deal of runoff even with good vegetative cover. If cover is poor, then runoff is greatly increased and water erosion is visible. This can create a serious problem with sedimentation downstream. Plant community integrity must be maintained if nutrient cycling is to carry on at maximum levels. This site is a prime example of how productive and functional a site can be with a good plant community and how unproductive and dysfunctional it can be with a degraded community.

The animal community that uses the site for habitat is diverse. In reference condition, this site is ideal habitat for the lesser prairie chicken. There are still a few places where this species can be found on this site. White-tailed deer do use the site but the shrub and tree cover is not sufficient for that specie’s habitat needs. Mule deer utilize the site, and where some shrub cover does occur, bob-white quail will be found. Coyotes, bobcats, jackrabbits, small mammals, and occasional pronghorn will be seen. It is basically a grassland community so most wildlife species are those which inhabit a grassland ecosystem.

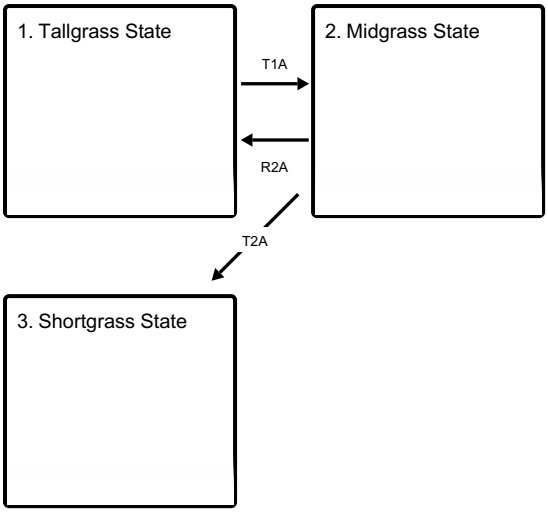
Plant Communities and Transitional Pathways:

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 not shown in the diagram. Those shown are some of the most common states observed. This information is intended to illustrate the changes that can occur in certain circumstances, and may not happen this way in all cases. Local professional guidance should be sought when making plans to manipulate plant communities for specific purposes.

As a site changes in the structure and makeup of the plant community, the changes may be due to management or due to natural occurrences or both. Changes may occur slowly or fairly rapidly depending on the type of events occurring. At some point in time thresholds are crossed. This means that once changes in vegetation have progressed to some certain point, the balance of the community has been altered to the extent that a return to the former vegetative state is generally not possible, that is, not possible without some form of energy being applied in order to make the community respond in that direction. These changes in plant communities occur on all ecological sites with some sites being more resistant to change than others. Also, some sites seem to be more resilient, being more easily restored. Usually, changes in management practices alone, such as different grazing methods, will not result in major changes to the community. An example of energy input that might be required to effect change might be the implementation of chemical brush management and complete growing season rest to reduce domination of woody shrubs and change the community to one or more perennial grasses and forbs. This action might have to be done more than once and might take several years. Such a vegetative shift could surely not be accomplished by regulation of grazing alone. The amount of energy required to effect change would depend on the present vegetative state and the desired state.

State and transition model

Ecosystem states

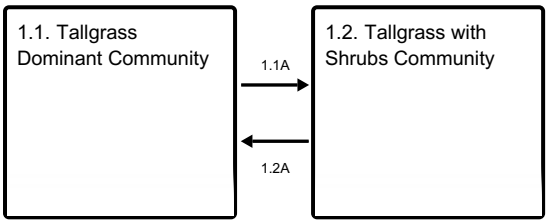


T1A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

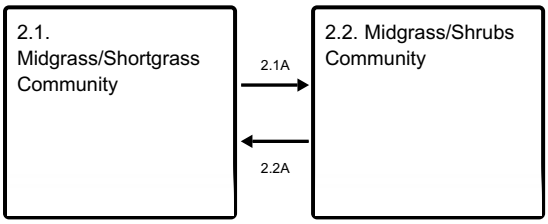
R2A - Adequate rest from defoliation, followed by reintroduction of historic disturbance regimes

T2A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

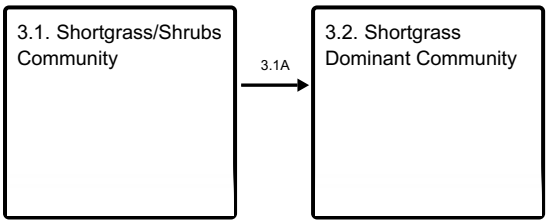
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Tallgrass State

The Tallgrass Dominant Community for the Loamy Upland ecological site is primarily composed of tallgrasses. Little bluestem with smaller amounts of sand bluestem and Indiangrass are the principal species. Midgrasses such as sideoats grama make up a smaller component of the community. There is a variety of forbs but they are overshadowed by the grasses. A few shrubs such as sand sagebrush, skunkbush, and yucca are found but are subordinate to the grasses and are not increasing. There are some isolated cottonwood, hackberry, and western soapberry trees present, mostly along the drainage ways. The Tallgrass with Shrubs Community is still primarily tallgrasses. Little bluestem with smaller amounts of sand bluestem and Indiangrass are the principal species. Midgrasses such as sideoats grama make up a smaller component of the community. There is a variety of forbs but they are overshadowed by the grasses. Shrubs such as sand sagebrush, skunkbush and yucca are increasing

significantly. There are some hardwood trees such as cottonwood, hackberry, and western soapberry trees present mostly along the drainage ways.

Dominant plant species

- little bluestem (*Schizachyrium scoparium*), grass
- sand bluestem (*Andropogon hallii*), grass

Community 1.1
Tallgrass Dominant Community

Figure 4. 1.1Tallgrass Community

The reference plant community is primarily tallgrasses. Little bluestem with smaller amounts of sand bluestem and Indiangrass are the principal species. Midgrasses such as sideoats grama make up a smaller component of the community. There is a variety of forbs but they are overshadowed by the grasses. A few shrubs such as sand sagebrush, skunkbush (*Rhus aromatica*), and yucca (Yucca spp.) are found but are subordinate to the grasses and are not increasing. There are some isolated cottonwood, hackberry, and western soapberry trees present, mostly along the drainage ways.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2466	3194	3755
Forb	112	168	84
Shrub/Vine	34	45	50
Tree	6	6	6
Total	**2618**	**3413**	**3895**

Figure 6. Plant community growth curve (percent production by month). TX2018, Tallgrass prairie - climax. Tall Grass Prairie.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	6	23	24	12	10	10	8	2	1

Community 1.2
Tallgrass with Shrubs Community

Figure 7. 1.2 Tallgrass with Shrubs Community

The Tallgrass with Shrubs Community is still primarily tallgrasses. Little bluestem with smaller amounts of sand bluestem and Indiangrass are the principal species. Midgrasses such as sideoats grama make up a smaller component of the community. There is a variety of forbs but they are overshadowed by the grasses. Shrubs such as sand sagebrush, skunkbush and yucca are increasing significantly. There are some hardwood trees such as cottonwood, hackberry, and western soapberry trees present mostly along the drainage ways.

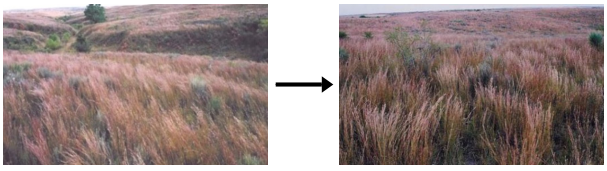
Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2466	3194	3755
Forb	112	168	196
Shrub/Vine	34	45	50
Microbiotic Crusts	17	22	28
Tree	6	6	6
Total	**2635**	**3435**	**4035**

Figure 9. Plant community growth curve (percent production by month). TX2019, Tall/Midgrass prairie with trees, shrubs and forbs. Tall and midgrasses with trees, small shrubs and forbs in near historic climax..

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

Pathway 1.1A
Community 1.1 to 1.2



Tallgrass Dominant Community

Tallgrass with Shrubs Community

With Prescribed Grazing and no fires, the Tallgrass Dominant Community will shift to the Tallgrass with Shrubs Community.

Conservation practices

Prescribed Grazing

Pathway 1.2A
Community 1.2 to 1.1

Tallgrass with Shrubs Community

Tallgrass Dominant Community

With the use of conservation practices such Prescribed Grazing and Prescribed Burning can reverse the transition from the Tallgrass with Shrubs Community back towards the Tallgrass Dominant Community.

Conservation practices

Prescribed Burning
Prescribed Grazing

State 2
Midgrass State

The Midgrass/Shortgrass Community is principally sideoats grama and blue grama with smaller amounts of little bluestem, a few perennial forbs and a few shrubs. In reference conditions it is doubtful that any mesquite would be found on the site but there are commonly a few mesquite present today, even on well managed ranges. The production is less than the tall grass community on the slopes and in the draws. The Midgrass/Shrubs Community occurs on the sloping portion of the site and reflects some grazing pressure. Tallgrass species no longer dominate the site. Midgrasses have increased along with sand sagebrush. Production is less and trend is away from the reference community.

Dominant plant species

- sideoats grama (*Bouteloua curtipendula*), grass
- blue grama (*Bouteloua gracilis*), grass

Community 2.1
Midgrass/Shortgrass Community

Figure 10. 2.1 Midgrass/Shortgrass Community

This plant community is principally sideoats grama and blue grama with smaller amounts of little bluestem, a few perennial forbs and a few shrubs. Historically, it is doubtful that any mesquite would be found on the site but there are commonly a few mesquite present today, even on well managed ranges. The production is less than the tall grass community on the slopes and in the draws. These areas were always more likely to be grazed because of their more gently slopes and their higher position on the landscape. The soils are deeper on this aspect and runoff is generally less due to less sloping terrain.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1345	1793	2130
Forb	112	157	179
Shrub/Vine	34	45	50
Tree	–	6	11
Total	**1491**	**2001**	**2370**

Figure 12. Plant community growth curve (percent production by month). TX2020, Midgrass/Shortgrass with few shrubs. Site comprising of mid and shortgrasses with few shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	15	25	20	5	5	15	8	1	0

Community 2.2
Midgrass/Shrubs Community

Figure 13. 2.2 Midgrass/Shrubs Community

This community occurs on the sloping portion of the site and reflects some grazing pressure. Tallgrass species no longer dominate the site. Midgrasses have increased along with sand sagebrush. Production is less and trend is away from the reference community. With brush management and growing season rest, this community will improve in both species composition and production and will progress back in the direction of the reference community.

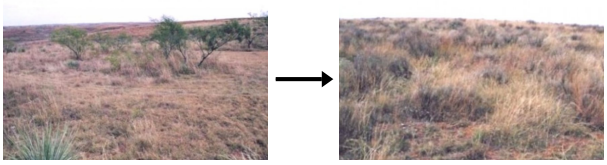
Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1065	1569	1961
Shrub/Vine	112	168	196
Forb	112	140	179
Tree	6	6	11
Total	**1295**	**1883**	**2347**

Figure 15. Plant community growth curve (percent production by month). TX2021, Midgrass/Shrubs. Midgrasses and some remnants of tall grasses with shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	5	8	24	25	12	7	10	5	2	0

Pathway 2.1A
Community 2.1 to 2.2



Midgrass/Shortgrass Community

Midgrass/Shrubs Community

With heavy continuous grazing, no fires, brush invasion, and no brush management, the Midgrass/Shortgrass Community will shift to the Midgrass/Shrubs Community.

Pathway 2.2A
Community 2.2 to 2.1

Midgrass/Shrubs Community

Midgrass/Shortgrass Community

With Prescribed Grazing, Prescribed Burning, and Brush Management, the plant community will shift from the Midgrass/Shrubs Community back to the Midgrass/Shortgrass Community.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

State 3
Shortgrass State

Degraded and low vigor shortgrasses prevail along with annual forbs and grasses. Production is very low. Even with careful management, this site will not be able to be restored to the tall and midgrass community it once supported. The site will probably be limited to short and midgrasses.

Dominant plant species

- threeawn (*Aristida*), grass
- hairy grama (*Bouteloua hirsuta*), grass

Community 3.1
Shortgrass/Shrubs Community

Figure 16. 3.1 Shortgrass/Shrubs Community

This plant community is the result of years of abusive grazing. It occurs most frequently on the ridgetop part of the site. Degraded and low vigor shortgrasses prevail along with annual forbs and grasses. Surface erosion is beginning to occur, infiltration is greatly reduced and runoff is increased. Production is very low. The hydrological functions are poor. This plant community will require several seasons of growing season rest and perhaps some control of competitive plants in order to restore a good grass cover. Even with careful management, this site will not be able to be restored to the tall and midgrass community it once supported. The site will probably be limited to short and midgrasses.

Table 9. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	336	448	673
Forb	112	168	224
Shrub/Vine	34	56	67
Tree	6	6	6
Total	**488**	**678**	**970**

Figure 18. Plant community growth curve (percent production by month). TX2022, Shortgrasses/Annual grasses/Shrubs . Shortgrasses, shrubs, and annuals having low production and being degraded..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	16	27	25	7	4	10	5	1	0

Community 3.2
Shortgrass Dominant Community

This plant community is the result of years of management inputs. This plant community has recovered from the degraded Shortgrass Community with several seasons of growing season rest and control of competitive plants in order to restore a good grass cover. The site will probably be limited to short and midgrasses.

Table 10. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	336	448	673
Forb	112	168	224
Shrub/Vine	34	56	67
Tree	6	6	6
Microbiotic Crusts	–	–	–
Total	**488**	**678**	**970**

Figure 20. Plant community growth curve (percent production by month). TX2050, Shrubs and Shortgrass community. shortgrasses, warm- and cool-season forbs, and short shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	8	16	25	5	5	10	16	8	3

Pathway 3.1A
Community 3.1 to 3.2

With the application of Prescribed Grazing and Brush Management, the Shortgrass/Shrub Community will shift to the Shortgrass Community.

Conservation practices

Brush Management
Prescribed Grazing

Transition T1A
State 1 to 2

Heavy continuous grazing, no fires, and brush invasion occurring in ten or more years will lead the transition from the Tallgrass State to Midgrass State.

Restoration pathway R2A
State 2 to 1

With Prescribed Grazing, Brush Management and Prescribed Burning conservation practices implemented over a five to eight year period, the Midgrass State can be restored to the Tallgrass State.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Transition T2A
State 2 to 3

Heavy continuous grazing and no fires over a twenty-five year period will cause the transition from the Tallgrass State to Midgrass to occur.

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
0	**Tallgrass**			1569–1793	
1	**Tallgrasses**			336–616	
	sand bluestem	ANHA	*Andropogon hallii*	112–280	–
	switchgrass	PAVI2	*Panicum virgatum*	112–280	–
	Indiangrass	SONU2	*Sorghastrum nutans*	112–280	–
2	**Midgrasses**			280–448	
	sideoats grama	BOCU	*Bouteloua curtipendula*	112–280	–
	blue grama	BOGR2	*Bouteloua gracilis*	112–280	–
3	**Cool-Season Grasses**			84–168	
	Canada wildrye	ELCA4	*Elymus canadensis*	28–112	–
	Texas bluegrass	POAR	*Poa arachnifera*	28–112	–
4	**Mid/Shortgrasses**			224–448	
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	0–112	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–112	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	0–112	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	0–112	–
	fall witchgrass	DICO6	*Digitaria cognata*	0–112	–
	composite dropseed	SPCO16	*Sporobolus compositus*	0–112	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	0–112	–
Forb					
5	**Forbs**			112–179	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–45	–
	white sagebrush	ARLUM2	*Artemisia ludoviciana ssp. mexicana*	0–45	–
	yellow sundrops	CASE12	*Calylophus serrulatus*	0–45	–
	purple prairie clover	DAPU5	*Dalea purpurea*	0–45	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	0–45	–
	annual buckwheat	ERAN4	*Eriogonum annuum*	0–45	–
	beeblossom	GAURA	*Gaura*	0–45	–
	trailing krameria	KRLA	*Krameria lanceolata*	0–45	–
	dotted blazing star	LIPU	*Liatris punctata*	0–45	–
	Nuttall's sensitive-briar	MINU6	*Mimosa nuttallii*	0–45	–
	Fendler's penstemon	PEFE	*Penstemon fendleri*	0–45	–
	white milkwort	POAL4	*Polygala alba*	0–45	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	0–45	–
	Drummond's skullcap	SCDR2	*Scutellaria drummondii*	0–45	–
	white heath aster	SYERE	*Symphyotrichum ericoides var. ericoides*	0–45	–
	stiff greenthread	THFII	*Thelesperma filifolium var. intermedium*	0–45	–
Shrub/Vine					

Shrub/Vine					
6	**Shrubs/Vines**			34–50	
	leadplant	AMCA6	*Amorpha canescens*	0–11	–
	sand sagebrush	ARFI2	*Artemisia filifolia*	0–11	–
	vine jointfir	EPPE	*Ephedra pedunculata*	0–11	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	0–11	–
	skunkbush sumac	RHTRT	*Rhus trilobata var. trilobata*	0–11	–
	soapweed yucca	YUGL	*Yucca glauca*	0–11	–
Tree					
7	**Trees**			6–17	
	hackberry	CELTI	*Celtis*	0–17	–
	Pinchot's juniper	JUPI	*Juniperus pinchotii*	0–17	–
	plains cottonwood	PODEM	*Populus deltoides ssp. monilifera*	0–17	–
	western soapberry	SASAD	*Sapindus saponaria var. drummondii*	0–17	–

Table 12. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
0	**Tallgrasses**			224–336	
1	**Mid/Shortgrasses**			841–1177	
	sideoats grama	BOCU	*Bouteloua curtipendula*	420–588	–
	blue grama	BOGR2	*Bouteloua gracilis*	420–588	–
2	**Mid/Shortgrasses**			336–560	
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	0–140	–
	buffalograss	BODA2	*Bouteloua dactyloides*	0–140	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–140	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	0–140	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	0–140	–
	Arizona cottontop	DICA8	*Digitaria californica*	0–140	–
	fall witchgrass	DICO6	*Digitaria cognata*	0–140	–
	vine mesquite	PAOB	*Panicum obtusum*	0–140	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	0–140	–
3	**Cool-season grasses**			34–50	
	Canada wildrye	ELCA4	*Elymus canadensis*	0–28	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–28	–
Forb					
4	**Forbs**			112–179	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–45	–
	lyreleaf greeneyes	BELY	*Berlandiera lyrata*	0–45	–
	yellow sundrops	CASE12	*Calylophus serrulatus*	0–45	–
	purple prairie clover	DAPU5	*Dalea purpurea*	0–45	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	0–45	–
	annual buckwheat	ERAN4	*Eriogonum annuum*	0–45	–
	beeblossom	GAURA	*Gaura*	0–45	–

	trailing krameria	KRLA	*Krameria lanceolata*	0–45	–
	dotted blazing star	LIPU	*Liatris punctata*	0–45	–
	Nuttall's sensitive-briar	MINU6	*Mimosa nuttallii*	0–45	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–45	–
Shrub/Vine					
5	**Shrubs/Vines**			45–56	
	sand sagebrush	ARFI2	*Artemisia filifolia*	0–17	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	0–17	–
	littleleaf sumac	RHMI3	*Rhus microphylla*	0–17	–
	skunkbush sumac	RHTR	*Rhus trilobata*	0–17	–
	soapweed yucca	YUGL	*Yucca glauca*	0–17	–
Tree					
6	**Trees**			6–11	
	hackberry	CELTI	*Celtis*	0–11	–
	Pinchot's juniper	JUPI	*Juniperus pinchotii*	0–11	–

Animal community

The animal community that inhabits this site is generally composed of species that prefer a grassland ecosystem. Mule deer and occasional white-tailed deer will be observed. Bob-white quail will be found but usually in the draws where some shrub cover is likely to be found. Pronghorn and lesser prairie chicken are species that historically occupied the site in great numbers, but now only small populations are found. Many species of grassland song birds can be observed on the site as well as many small mammals. Predators like coyotes and bobcats are commonly seen.

Hydrological functions

This site is an upland site with considerable sloping terrain. Runoff is at least moderate, even with good vegetative cover. If the cover happens to be poor, as with a shortgrass dominated community, the vegetative retardance is low and runoff is high. Surface and gully erosion can be high on this site in a degraded ecological condition. Sedimentation down stream may occur.

Recreational uses

The site is used for hiking, horseback riding, bird and animal watching, hunting, camping and associated activities.

Wood products

There are no wood products produced on the site.

Other products

None.

Other information

None.

Inventory data references

The information in this document is based on observation of range sites over many years, knowledge of where well

managed rangelands are located, and from the review of data such as NRCS clipping studies, (417 data), old range inventories from ranch plans, and from range site descriptions. Historical accounts have also been reviewed.

Soil Survey Reports for counties in MLRA 78B, NRCS Field Office Technical Guide Section IIE, Range Site Descriptions, The Soil Series Official Descriptions, Ecological Checklist of Vascular Plants of Texas (Texas A&M Exp. Station),
Gould's Grasses of Texas, The Texas Panhandle Frontier by Frederick W. Rathjen, and
personal discussions with Dr. Ronald Sosebee, Texas Tech Dept. of Range, Wildlife and Fisheries, and with Dr. Robert Wright, Professor, Biology Dept., West Texas A&M Univ.

Other references

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Approval

Bryan Christensen, 9/15/2023

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.

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Date	09/04/2007
Approved by	Bryan Christensen
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Slight to moderate.

2. **Presence of water flow patterns:** Slight to moderate.

3. **Number and height of erosional pedestals or terracettes:** Slight to moderate.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20-25% bare ground.

5. **Number of gullies and erosion associated with gullies:** Slight to moderate.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight to moderate.

7. **Amount of litter movement (describe size and distance expected to travel):** Slight to moderate.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderate resistance to surface erosion if adequate vegetation is absent. The soils are moderately susceptible to wind and water erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Loams and silt loams surface with moderately high SOM.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Basal cover and density with small interspaces should make rainfall impact minimal. This site has moderately rapid permeable soils, runoff is medium to high depending on slope and available water holding capacity is medium.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: Warm-season midgrasses >

Sub-dominant: Warm-season tallgrasses = Warm-season shortgrasses = Forbs >

Other: 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):** Plant mortality and decadence is minimal.

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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):** 2,350 to 3,500 pounds per acre.

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

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17. **Perennial plant reproductive capability:** All plant species should be capable of reproduction except during periods of prolonged drought conditions, heavy natural herbivory or intense wildfires.
