USDA Natural Resources Conservation Service

Ecological site R077AY012TX
Sandy Loam 16-22" PZ

Last updated: 9/11/2023
Accessed: 11/09/2024

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.

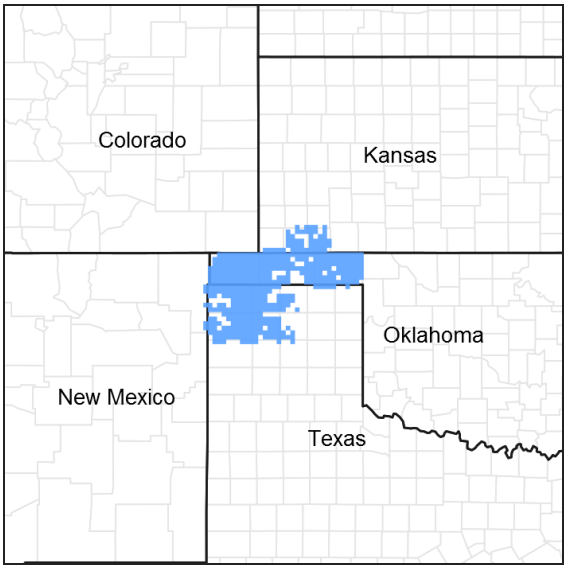


Figure 1. Mapped extent

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): 077A–Southern High Plains, Northern Part

MLRA 77A is characterized by nearly level plains with playa depressions and sloping breaks along rivers and creeks. Soils are generally deep, fine-textured, and occur in a mesic soil temperature regime.

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 sandy loam and fine sandy loam soils on uplands. Reference vegetation consists of midgrasses with some shortgrasses and forbs. Sand sagebrush is the visibly dominant woody species. Without periodic fire, the woody canopy may increase. Abusive grazing practices may cause a decline in the more palatable midgrasses.

Associated sites

R077AY011TX	**Sand Hills 16-22" PZ** Undulating to steep, poorly developed sandy soils on dunes. Structureless subsoils of sand and loamy sand. Combination of tall grasses and shrubs dominant, with with areas of bare ground.
R077AY666TX	**Sandy 16-22" PZ** Gently undulating to rolling soils on sand sheets and dunes with surface textures of loamy fine sand and coarse-loamy or fine-loamy argillic horizons. Tall- and midgrass dominant with few forbs and shrubs. Sandy sites have lower production potential.

Similar sites

R077EY066TX	**Sandy Loam 16-24" PZ** A similar site in MLRA 77E with soils formed in a slightly warmer thermic soil temperature regime.
R077AY015KS	**Loamy Upland 16-22" PZ** Nearly level to gently sloping soils with loam or silt loam surfaces and fine-loamy or fine-silty argillic horizons formed on loess plains or sand sheets on adjacent positions. Mid- and tallgrass species with forbs and very few woody species.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia filifolia*
Herbaceous	(1) *Bouteloua curtipendula* (2) *Schizachyrium scoparium*

Physiographic features

The Sandy Loam site occurs on nearly level to gently sloping plains. The soils are formed from loamy eolian sediments of late Pleistocene to Holocene age. Slope ranges from 0 to 3 percent and generates little runoff. Use is mainly cultivated cropland with much of the area under irrigation and some native mixed grass rangeland.

Table 2. Representative physiographic features

Landforms	(1) Plains > Sand sheet
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	2,500–4,500 ft
Slope	0–3%
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	2,300–4,990 ft
Slope	0–3%

Climatic features

Climate is a cold semi-arid steppe (Koppen-Geiger classification BSk). Summers are hot and winters are cold. Temperature extremes are common. Humidity is generally low, and short-term droughts are common. Humidity is generally low and evaporation high. Average annual wind speed is 12 mph with highest winds in early spring. The

prevailing wind direction is south. Summertime brings strong high pressure systems that build into heat domes with highs in the upper 90 to mid-100 degree F range. Evaporation in summer is high and open pan evaporation exceeds 6 feet per year. Early autumn temperatures are mild, with Canadian and Pacific cold fronts bringing cold air in mid-autumn throughout winter. Arctic air can settle in and dominate for several weeks during winter with very cold air in place for 2 to 3 weeks at a time.

Most of the precipitation comes in the form of rain from May through September. Rainfall events often occur as intense showers of relatively short duration. Snowfall average is about 15 inches but is also variable from 8 to 36 inches annually. Long term droughts are likely to occur every 15 to 20 years and may last 4 to 5 years. Mean precipitation is around 19 inches but varies significantly from year to year. Rainfall amounts over the last 100 years have varied from as little as 9 inches to as much as 37 inches. The probability is about 70% that precipitation will fall between 14 inches and 23 inches. Growing season averages 180 days. Average first frost is around October 17, and the last freeze of the season occurs around April 21.

Table 4. Representative climatic features

Frost-free period (characteristic range)	143-156 days
Freeze-free period (characteristic range)	175-190 days
Precipitation total (characteristic range)	18-21 in
Frost-free period (actual range)	138-163 days
Freeze-free period (actual range)	169-194 days
Precipitation total (actual range)	18-22 in
Frost-free period (average)	150 days
Freeze-free period (average)	182 days
Precipitation total (average)	19 in

Climate stations used

- (1) BOISE CITY 2 E [USC00340908], Boise City, OK
- (2) ELKHART [USC00142432], Elkhart, KS
- (3) LIBERAL [USC00144695], Liberal, KS
- (4) DUMAS [USC00412617], Dumas, TX
- (5) STRATFORD [USC00418692], Stratford, TX
- (6) GOODWELL 2 E [USW00003055], Goodwell, OK
- (7) HUGOTON [USC00143855], Hugoton, KS
- (8) PERRYTON [USC00416950], Perryton, TX
- (9) SPEARMAN [USC00418523], Spearman, TX

Influencing water features

Non-stream characteristics: Sandy loam soils allow for moderately rapid infiltration. With poor cover, minor gullies may form from water concentration. Plant available water in the soil is moderately high.

Wetland description

Soils in this ecological site are not part of wetland ecosystems.

Soil features

Soils are mapped for each county within the MLRA. Mapunits are representations of the major soil series component(s) and named accordingly. Each Mapunit is spatially represented on a digital soils map as polygons of different shapes and sizes. Within these Mapunits, there are often minor soil series components included. These minor components are soils that occur within a Mapunit polygon but are of small extent (15% or less of the Mapunit area). However, it is difficult to separate these minor soils spatially due to the scale of soil mapping.

Ecological sites are correlated at the component level of the soil survey. Therefore, a single Mapunit may contain multiple Ecological Sites just as it may contain multiple soil components. This is important to understand when investigating soils and Ecological Sites. A soil survey Mapunit may be correlated to a single Ecological Site based on the major component; however, there may be inclusions of areas of additional Ecological Sites which are correlated to the minor components of that particular soil Mapunit.

These are very deep sandy loam and fine sandy loam soils with well developed argillic horizons of sandy clay loam or clay loam. They are moderate in fertility, have a medium level of water storage capability, have a moderate infiltration rate, and exhibit negligible to low runoff depending on slope and vegetative cover. They yield water to plants readily and are subject to wind erosion without good cover. If cover is poor and runoff is excessive, significant water erosion can also occur. Plant roots easily penetrate the soil.

Representative soil components for this site include: Belfon fine sandy loam, Bigbow fine sandy loam, and Dalhart fine sandy loam

Table 5. Representative soil features

Parent material	(1) Eolian deposits
Surface texture	(1) Fine sandy loam (2) Sandy loam
Family particle size	(1) Fine-loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	4.3–7.7 in
Calcium carbonate equivalent (0-40in)	0–15%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (0-40in)	0–4%
Subsurface fragment volume >3" (0-40in)	0%

Ecological dynamics

The information contained in the State and Transition Diagram (STD) and the Ecological Site Description was developed using archeological and historical data, professional experience, and scientific studies. The information presented is representative of a very complex set of plant communities. Not all scenarios or plants are included. Key indicator plants, animals and ecological processes are described to inform land management decisions.

The soils, topographic location, climate, periodic droughts and fire influenced the stabilization of the reference plant community on this site as was the case on most all High Plains ecological sites. This plant community as found by European settlers in the early 1800’s developed under the prevailing climate over time along with the soils in their topographic location. Grazing and/or browsing by local and nomadic wildlife influenced the plant community as well.

The resulting plant community was a Midgrass/Shortgrass/Tallgrass Community (1.1). Midgrasses tend to dominate over most of the site with sideoats grama (*Bouteloua curtipendula*) being the overall dominant species, lesser amounts of vine mesquite (*Panicum obtusum*), Arizona cottontop (*Digitaria californica*), plains bristlegrass (*Setaria leucopila*), hooded windmillgrass (*Chloris cucullata*), sand dropseed (*Sporobolus cryptandrus*), tumble windmillgrass (*Chloris verticillata*), silver bluestem (*Bothriochloa laguroides*), hairy grama (*Bouteloua hirsuta*), fall witchgrass (*Digitaria cognata*), gummy lovegrass (*Eragrostis curtipedicellata*), black grama (*Bouteloua eriopoda*), and sand muhly (*Muhlenbergia arenicola*). The dominant tallgrass is little bluestem (*Schizachyrium scoparium*) with lesser amounts of Indiangrass (*Sorghastrum nutans*) and sand bluestem (*Andropogon hallii*). In areas where tighter soils occur, the shortgrasses include blue grama (*Bouteloua gracilis*) and buffalograss (*Bouteloua dactyloides*). Some cool-season grasses occur in small amounts such as western wheatgrass (*Pascopyrum smithii*), Canada wildrye (*Elymus canadensis*) and needle & thread (*Hesperostipa comata*). Typically associated forbs included dotted gayfeather (*Liatris punctata*), prairie clover (*Dalea purpurea*), catclaw sensitivebriar (*Mimosa microphylla*), golden dalea (*Dalea aurea*), gaura (Gaura spp.), rushpea (Hoffmanseggia glauca), Engelmanndaisy (*Engelmannia peristenia*), lyreleaf greeneyes (*Berlandiera lyrata*), sagewort (*Artemisia ludoviciana*), scarlet globemallow (*Sphaeralcea coccinea*), Fendler's penstemon (*Penstemon fendleri*), wild alfalfa (*Psoralidium tenuiflorum*) and numerous annual forbs. Woody species include sand sagebrush (Artemesia filifolia), yucca (*Yucca glauca*), and catclaw mimosa (*Mimosa aculeaticarpa* var. biuncifera). Nutrient cycling, the water cycle, watershed protection and biological functions are functioning at their peak.

Natural fire likely played an important role in the function of most plains sites, especially the tallgrass communities. Tallgrasses such as sand bluestem and little bluestem were dependent upon fire to stimulate them and remove old growth that would accumulate on the soil surface. Fire also kept shrubs from getting too thick. Fire helped to keep a balance between the grasses, forbs and shrubs. Wildlife habitat was improved by opening up canopies and stimulating forb growth. The deep rooted species that grow on the site are not easily damaged by fire. Yucca and shrubs will usually re-sprout, but are suppressed for a time allowing grasses to dominate. If periodic fire does not occur, then the yucca and woody plants will slowly increase and with grazing pressure can begin to dominate the site. Since fire is not always available to be applied, then practices such as brush management may necessary from time to time to help keep the community in balance.

Periodic overgrazing and trampling by migrating herds of bison and resident herds of pronghorn antelope probably occurred during drought periods. However, long rest periods followed once the large herds of bison and antelope moved out of the area, allowing the resilient grassland to re-establish itself and maintain its climax community structure.

The major forces influencing the transition from the historic climax community is continued over-grazing by livestock and the decrease in the frequency and intensity of fire. As livestock and wildlife numbers increase and grazing use exceeds a plants ability to sustain defoliation, the more palatable and generally more productive species, decline in stature, productivity and density

Under good management this is one of the most productive sites in the Texas Panhandle and will give good animal performance. Little bluestem and sideoats grama are fairly resistant to grazing pressure but will decline if continuous heavy grazing persist. The tallgrasses are fairly sensitive to overgrazing and will begin to decrease more quickly if continuous heavy grazing occurs for long periods. If excessive grazing pressure continues, ecological retrogression occurs. The tendency of this site is to become a shortgrass dominant; sideoats grama and little bluestem will give way to blue grama. There will be an increase in perennial and annual forbs, with increasing amounts of yucca and sand sagebrush. The decrease in density and stature of the midgrasses and tallgrasses and an increase in shortgrasses and the density of the yucca and woody vegetation brings about a new plant community, the Shortgrass/Midgrass/Forb/Shrub Community (1.2).

In the Shortgrass/Midgrass/ Forb/Shrub Community (1.2), the transition back to near reference condition is attainable with proper grazing management, brush and pest management. Prescribed burning could be used if the conditions allow. The production of vegetation has shifted from mostly herbaceous vegetation to more yucca and woody, although the herbaceous vegetation biomass is still the largest amount. Nutrient cycling, the water cycle, watershed protection and biological functions have changed little.

If long-term heavy grazing continues, a threshold will be crossed to a Shortgrass/Shrub/Annuals Dominant Community (2.1). In this degraded state, typical vegetation will be low vigor blue grama, bare areas will open up with annuals filling the voids. Perennial threeawn will invade this site when the more desirable grasses are

weakened and/or removed. Yucca and sand sagebrush will increase dramatically. Occasionally, broom snakeweed (*Gutierrezia sarothrae*) will increase to the point of domination. The loss of herbaceous cover and increased bare ground encourages accelerated erosion. Nutrient cycling, the water cycle, watershed protection and biological functions have been severely reduced. The plant community is so degraded that it cannot reverse the transition without extensive energy and management inputs. Restoration of phase (2.1) will require prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical and/or mechanical brush management and some form of pest management. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this phase.

Recovery can occur fairly rapid if the competitive plants are controlled and proper grazing management is applied. Full recovery and maintenance of the HCPC requires continued proper grazing management as well as occasional brush and pest management.

NOTE: Rangeland Health Reference Worksheets have been posted for this site on the Texas NRCS website (www.tx.nrcs.usda.gov) in Section II of the eFOTG under (F) Ecological Site Descriptions.

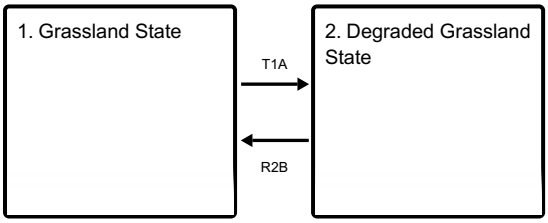
STATE AND TRANSITIONAL PATHWAYS DIAGRAM (Narrative):

The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.

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. At some point in time thresholds are crossed. This means that once changes have progressed to some certain point, the balance of the community has been altered to the extent that a return to the former state is not possible, that is, not possible unless some form of energy is applied to make it happen. These changes take place on all ecological sites, but some sites support communities that are more resistant to change than other sites. Also, some sites are more resilient, that is, they tend to be able to heal or restore themselves more easily. Usually, changes in management practices alone, such as grazing techniques, will not be sufficient to restore former plant communities. An example of energy input might be the implementation of chemical or mechanical brush management to decrease the amount of woody shrubs and increase the amount of grasses and forbs. This shift in community balance could not be brought about with grazing alone. The amount of energy required to bring about a change in plant community balance may vary a great deal depending on the present state and upon the desired result.

State and transition model

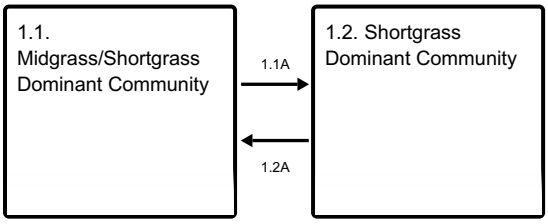
Ecosystem states



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

R2B - Adequate rest from defoliation, followed by reintroduction of historic disturbance regimes

State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Degraded Shortgrass Community

State 1
Grassland State

This is the reference state for the site. Midgrass/Shortgrass/Tallgrass Community (1.1) where midgrasses tend to dominate over most of the site with sideoats grama being the overall dominant species, lesser amounts of vine mesquite, Arizona cottontop, plains bristlegrass, and other midgrasses, The dominant tallgrass is little bluestem with lesser amounts of Indiangrass and sand bluestem. In areas where tighter soils occur, the shortgrasses include blue grama and buffalograss. Typically associated forbs included dotted gayfeather, prairie clover, catclaw sensitivebriar, and other desirable forbs. Woody species include sand sagebrush, yucca, and catclaw mimosa. If excessive grazing pressure continues, ecological retrogression occurs. The tendency of this site is to become a shortgrass dominant; sideoats grama and little bluestem will give way to blue grama. There will be an increase in perennial and annual forbs, with increasing amounts of yucca and sand sagebrush. The decrease in density and stature of the midgrasses and tallgrasses and an increase in shortgrasses and the density of the yucca and woody vegetation brings about a new plant community, the Shortgrass/Midgrass/Forb/Shrub Community (1.2).

Dominant plant species

- sand sagebrush (*Artemisia filifolia*), shrub
- sideoats grama (*Bouteloua curtipendula*), grass
- little bluestem (*Schizachyrium scoparium*), grass

Community 1.1
Midgrass/Shortgrass Dominant Community

Figure 8. 1.1 Midgrass/Shortgrass Community

The interpretive plant community for this site is this "reference" plant community. It is a good mixture of midgrasses, shortgrasses and lesser amounts of tallgrasses make up approximately (90%) of the plant community. Midgrasses tend to dominate over most of the site with sideoats grama being the overall dominant species. Little bluestem is the dominant tallgrass and blue grama is the dominant shortgrass. The cool-season grasses include western wheatgrass, Canada wildrye and needle & thread in lesser amounts. There is a good variety of perennial forbs (see Annual Production below) making up (3 – 5%) of the community with sand sagebrush and yucca making up another (3 – 5%) of the overall plant community. The plant community’s ecological processes were in balance with the environment. Most energy and nutrient cycling was contained in the narrow grass/soil interface and evapo-transpiration was minimal. Maintenance of this community requires continued proper grazing management as well as occasional brush and pest management.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1260	1440	1620
Forb	70	80	90
Shrub/Vine	70	80	90
Tree	0	0	0
Microbiotic Crusts	0	0	0
Total	**1400**	**1600**	**1800**

Figure 10. Plant community growth curve (percent production by month). TX0526, Midgrasses/Shortgrasses/Tallgrasses. A community of mainly sideoats grama, with smaller amounts of little bluestem and blue grama throughout. .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	6	9	22	25	12	6	11	4	2	1

Community 1.2
Shortgrass Dominant Community

As retrogression occurs, the tendency of this site is to become a shortgrass dominant community. This plant community has not crossed a threshold and can be managed back to Shortgrass/Midgrass Dominant Community (1.1). The sideoats grama and little bluestem will give way to blue grama. There will be an increase in perennial and annual forbs, with increasing amounts of yucca and sand sagebrush. The production of vegetation has shifted from mostly herbaceous vegetation to more yucca and woody, although the herbaceous vegetation biomass is still the largest amount. Nutrient cycling, the water cycle, watershed protection and biological functions have changed little. The transition back to near reference conditions is achievable with proper grazing management, prescribed fire, and brush and pest management.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	900	1050	1200
Shrub/Vine	200	250	300
Forb	80	120	160
Microbiotic Crusts	0	5	5
Tree	0	0	0
Total	**1180**	**1425**	**1665**

Figure 12. Plant community growth curve (percent production by month). TX0527, Shortgrass/Midgrass/Shrubs. Shortgrasses, midgrasses, and shrubs in lower production..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	15	25	22	10	8	10	4	1	1

Pathway 1.1A
Community 1.1 to 1.2

With heavy continuous grazing, no fires, and no brush management practices implemented, the Midgrass/Shortgrass Dominant Community will transition to the Shortgrass Dominant Community.

Pathway 1.2A
Community 1.2 to 1.1

With the implementation of various desirable conservation practices such as Prescribed Grazing and Brush Management, the Shortgrass Dominant Community can revert back to the Midgrass/Shortgrass Dominant Community.

Conservation practices

Brush Management
Prescribed Grazing

State 2
Degraded Grassland State

Shortgrasses such as blue grama remain in low vigor. Increase in grasses such as low production perennial three-awns. Shrubs are reaching greater than 40 percent canopy cover of sand sagebrush and yucca. There is also increased production of annuals and an increase in percentage of bare ground.

Dominant plant species

- sand sagebrush (*Artemisia filifolia*), shrub
- broom snakeweed (*Gutierrezia sarothrae*), shrub
- buffalograss (*Bouteloua dactyloides*), grass
- hairy grama (*Bouteloua hirsuta*), grass

Community 2.1
Degraded Shortgrass Community

Figure 13. 2.1 Degraded Shortgrass Community

In this phase of retrogression a threshold has been crossed to a Degraded Shortgrass Community (2.1). In this degraded state, typical vegetation will be low vigor blue grama; bare areas will open up with annuals filling the voids. Perennial three-awn will invade this site when the more desirable grasses are weakened and/or removed. Yucca and sand sagebrush will increase dramatically with up to >40 percent canopy. Occasionally broom snakeweed may invade the community to the point of domination. The loss of herbaceous cover and increased bare ground encourages accelerated erosion. Nutrient cycling, the water cycle, watershed protection and biological functions have been severely reduced. The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. Restoration of phase (2.1) will require prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical and/or mechanical brush management and some form of pest management. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this phase.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	300	450	600
Shrub/Vine	300	350	400
Forb	50	75	100
Microbiotic Crusts	0	1	1
Tree	0	0	0
Total	**650**	**876**	**1101**

Figure 15. Plant community growth curve (percent production by month). TX0528, Shortgrass/Shrubs/Annuals. Shortgrasses with lower amounts of midgrasses, increasing shrubs and lower overall production..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	25	34	24	6	2	3	1	0	0

Transition T1A
State 1 to 2

Restoration pathway R2B
State 2 to 1

Restoration of Degraded Grassland State (2.1) to the Midgrass/Shortgrass Dominant Community (1.1) will require prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical and/or mechanical brush management and some form of pest management. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this phase.

Conservation practices

Brush Management
Prescribed Grazing
Range Planting
Integrated Pest Management (IPM)

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Tall/Mid/Shortgrass**			625–820	
	sideoats grama	BOCU	*Bouteloua curtipendula*	250–330	–
	blue grama	BOGR2	*Bouteloua gracilis*	250–330	–
	little bluestem	SCSC	*Schizachyrium scoparium*	125–160	–
2	**Tallgrasses**			125–160	
	sand bluestem	ANHA	*Andropogon hallii*	125–160	–
	Indiangrass	SONU2	*Sorghastrum nutans*	125–160	–
3	**Cool-season grasses**			125–160	
	Canada wildrye	ELCA4	*Elymus canadensis*	125–160	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	125–160	–
	western wheatgrass	PASM	*Pascopyrum smithii*	125–160	–

	western wheatgrass	PASM	*Pascopyrum smithii*	120–160	–
4	**Midgrasses**			193–240	
	hooded windmill grass	CHCU2	*Chloris cucullata*	193–240	–
	Arizona cottontop	DICA8	*Digitaria californica*	193–240	–
	vine mesquite	PAOB	*Panicum obtusum*	193–240	–
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	193–240	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	193–240	–
5	**Mid/Shortgrasses**			192–240	
	buffalograss	BODA2	*Bouteloua dactyloides*	192–240	–
	black grama	BOER4	*Bouteloua eriopoda*	192–240	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	192–240	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	192–240	–
	tumble windmill grass	CHVE2	*Chloris verticillata*	192–240	–
	fall witchgrass	DICO6	*Digitaria cognata*	192–240	–
	gummy lovegrass	ERCU	*Eragrostis curtipedicellata*	192–240	–
	ear muhly	MUAR	*Muhlenbergia arenacea*	192–240	–
Forb					
6	**Forbs**			70–90	
	Forb, annual	2FA	*Forb, annual*	70–90	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	70–90	–
	lyreleaf greeneyes	BELY	*Berlandiera lyrata*	70–90	–
	golden prairie clover	DAAU	*Dalea aurea*	70–90	–
	prairie clover	DALEA	*Dalea*	70–90	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	70–90	–
	beeblossom	GAURA	*Gaura*	70–90	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	70–90	–
	dotted blazing star	LIPU	*Liatris punctata*	70–90	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	70–90	–
	Fendler's penstemon	PEFE	*Penstemon fendleri*	70–90	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	70–90	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	70–90	–
Shrub/Vine					
7	**Shrubs**			70–90	
	sand sagebrush	ARFI2	*Artemisia filifolia*	70–90	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	70–90	–
	yucca	YUCCA	*Yucca*	70–90	–

Animal community

Native animals that occupy this site include scaled quail, pronghorn, lesser prairie chicken and various small mammals and grassland birds. The site lacks woody cover for deer and turkey.

Hydrological functions

This site captures much of the water that falls on it, provided the vegetation is in good condition. The sandy loam

soil infiltrates water fairly rapidly. There is not significant runoff if cover is good. With poor cover, runoff is significant and small gullies can develop.

Recreational uses

Hunting, Camping, Hiking, Bird watching, Photography, Horseback Riding

Wood products

None

Other products

None

Other information

None

Inventory data references

NRCS FOTG – Section II of the FOTG Range Site Descriptions and numerous historical accounts of vegetative conditions at the time of early settlement in the area were used in the development of this site description. Vegetative inventories were made at several site locations for support documentation.

Inventory Data References: (documents)

NRCS FOTG – Section II - Range Site Descriptions
NRCS Clipping Data summaries over a 20 year period

Other references

J.R. Bell , USDA-NRCS Rangeland Management Specialist (retired)
Natural Resources Conservation Service - Range Site Descriptions
USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database
Rathjen, Frederick W., The Texas Panhandle Frontier, Rev. 1998, Univ. of Texas Press
Hatch, Brown and Ghandi, Vascular Plants of Texas (An Ecological Checklist)
Texas A&M Exp. Station, College Station, Texas
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Approval

Bryan Christensen, 9/11/2023

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.

Author(s)/participant(s)	Stan Bradbury, Zone RMS, NRCS, Lubbock, Texas
Contact for lead author	806-791-0581
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:** None to slight.

2. **Presence of water flow patterns:** None to slight.

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

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

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

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

7. **Amount of litter movement (describe size and distance expected to travel):** None to slight.

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

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Fine sandy loam, friable surface and medium SOM.

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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 moderate permeability, runoff is slow and available water holding capacity is high.

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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 midgrasses = Warm-season shortgrasses >

    Sub-dominant: Warm-season tallgrasses = Cool-season grasses >

    Other: Forbs = Shrubs

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimum mortality and decadence.

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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):** 1400-1800 lbs/ac

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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:** Sand sagebrush and Yucca.

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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.