USDA Natural Resources Conservation Service

Ecological site R077CY035TX
Sandy 16-21" PZ

Last updated: 9/11/2023
Accessed: 05/05/2024

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.

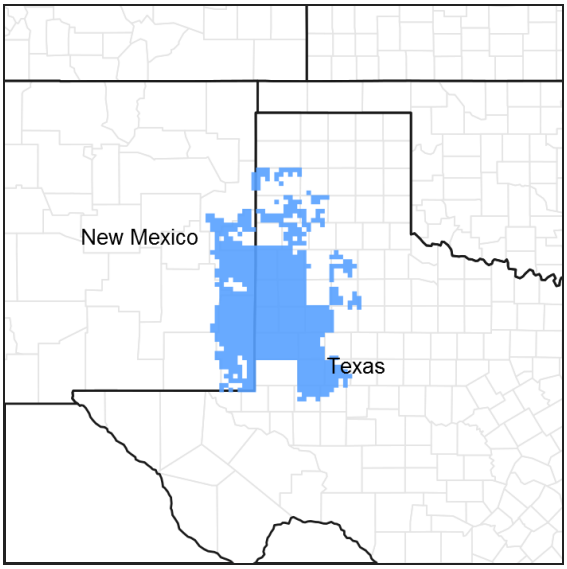


Figure 1. Mapped extent

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): 077C–Southern High Plains, Southern Part

MLRA 77C is characterized by nearly level plains with numerous playa depressions, moderately sloping breaks along drainageways, and a steep escarpment along the eastern margin. From southwest to northeast, soils grade from coarse-textured to fine-textured. Soils are generally deep and occur in a thermic soil temperature regime and ustic soil moisture regime bordering on aridic. Current land use is dominantly cropland.

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 deep, loamy fine sand soils on gently rolling uplands. The reference vegetation includes tall and midgrasses with forbs and few shrubs. Abusive grazing practices can lead to a decrease in palatable species and a shift in the plant community. Without fire or other brush management, the woody species may increase across the site.

Associated sites

R077CY034TX	**Sand Hills 16-21" PZ** Sand Hills are on dunes and hills of higher landscape positions. These sites are adjacent to and intermingled with the Sandy sites. Tallgrasses, Midgrasses, and shrubs dominate these sites.
R077CY036TX	**Sandy Loam 16-21" PZ** The Sandy Loam site is on plains and playa slopes and associated with Sandy sites on similar landscape positions. These sites are adjacent to and intermingled with Sandy sites. Midgrasses and shortgrasses dominate on these sites.
R077CY028TX	**Limy Upland 16-21" PZ** Limy Upland is on plains, interdunes, and playa slopes. This site is associated with Sandy sites that are on similar or slightly higher landscape positions. Midgrasses and shortgrasses dominate these sites.

Similar sites

R077CY052NM	**Loamy Sand** The Loamy Sand site is on nearly level to gently sloping plains and similar to Sandy sites. Midgrasses, tallgrasses, and shrubs dominate these sites.
R077BY658TX	**Sandy 12-17" PZ** This site occurs on very deep, loamy fine sand soils on gently rolling uplands. The reference vegetation includes tall and midgrasses with forbs and few shrubs.
R077DY046TX	**Sandy 12-17" PZ** This site occurs on very deep, loamy fine sand soils on gently rolling uplands. The mean annual precipitation is lower (15 to 17 inches) on this site and is less productive than the Sandy site in MLRA 77C. The reference vegetation includes tall and midgrasses with forbs and few shrubs.

Table 1. Dominant plant species

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

Physiographic features

This upland site is well drained and composed of nearly level to undulating gently sloping plains, concave plains, interdunes, playa slopes, and adjacent to natural drainage ways. Elevations generally range from 2600 to 5100 feet. Surface textures range from loamy fine sands to fine sands with slopes ranging from 0 to 5 percent and runoff is negligible to low.

Table 2. Representative physiographic features

Landforms	(1) Plateau > Plain (2) Sandhills > Interdune
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	792–1,554 m
Slope	0–5%
Ponding depth	0 cm
Water table depth	203 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Climate is semi-arid dry steppe. Summers are hot with winters being generally mild with numerous cold fronts that drop temperatures into the single digits for 24 to 48 hours. Temperature extremes are the rule rather than the exception. Humidity is generally low and evaporation high. Wind speeds are highest in the spring and are generally southwesterly. Canadian and Pacific cold fronts come through the region in fall, winter and spring with predictability and temperature changes can be rapid. Most of the precipitation comes in the form of rain and during the period from May through October. Snowfall averages around 15 inches but may be as little as 8 inches or as much as 36 inches. Rainfall in the growing season often comes as intense showers of relatively short duration. Long-term droughts occur on the average of once every 20 years and may last as long as five to six years (during these drought years, moisture during the growing season is from 50 to 60 percent of the mean). Based on long-term records, approximately 60 percent of the years are below the mean rainfall and approximately 40 percent are above the mean. May, June and July are the main growth months for perennial warm season grasses. Forbs make their growth somewhat earlier.

Table 3. Representative climatic features

Frost-free period (characteristic range)	157-187 days
Freeze-free period (characteristic range)	186-205 days
Precipitation total (characteristic range)	457-508 mm
Frost-free period (actual range)	148-198 days
Freeze-free period (actual range)	182-210 days
Precipitation total (actual range)	457-508 mm
Frost-free period (average)	175 days
Freeze-free period (average)	198 days
Precipitation total (average)	483 mm

Climate stations used

- (1) BIG SPRING [USW00023041], Big Spring, TX
- (2) DENVER CITY [USC00412408], Denver City, TX
- (3) CAMERON [USC00291332], Grady, NM
- (4) PORTALES [USC00297008], Portales, NM
- (5) MULESHOE #1 [USC00416135], Muleshoe, TX
- (6) LITTLEFIELD [USC00415265], Littlefield, TX
- (7) LEVELLAND [USC00415183], Levelland, TX
- (8) PLAINS [USC00417074], Plains, TX
- (9) BROWNFIELD #2 [USC00411128], Brownfield, TX
- (10) LAMESA 1 SSE [USC00415013], Lamesa, TX

Influencing water features

Water features are not an influencing factor in this site.

Wetland description

N/A

Soil features

The Sandy site is made up of very deep, nearly level to gently sloping, noncalcareous loamy fine sands on uplands and shallow swales. This site was formed from loamy eolian sediments. Slopes range from 0 to 5 percent and elevation ranges from 2,600 to 5,100 feet. These soils are well drained and permeability is moderately rapid to moderate. Due to the fine sand and loamy sand soil texture, wind and water erosion is moderate without vegetative

cover.

Major Soil Taxonomic Units correlated to this site include: Amarillo loamy fine sand, Arvana loamy fine sand, Brownfield fine sand, Gomez loamy fine sand, Notrees fine sand, Patricia loamy fine sand, Plains fine sand, Spantara fine sand and loamy fine sand, Tokio loamy fine sand, and Yoakran fine sand.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–metamorphic and sedimentary rock
Surface texture	(1) Loamy fine sand (2) Fine sand
Family particle size	(1) Loamy (2) Fine-loamy (3) Coarse-loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Depth to restrictive layer	203 cm
Soil depth	203 cm
Surface fragment cover <=3"	0–3%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.1–17.27 cm
Calcium carbonate equivalent (0-101.6cm)	0–50%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.8
Subsurface fragment volume <=3" (0-101.6cm)	0–10%
Subsurface fragment volume >3" (0cm)	0%

Ecological dynamics

The reference plant community on the Sandy ecological site 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 Tallgrass/Midgrass Community (1.1) is composed of tall and midgrasses, associated forbs, and scattered woody shrubs. Dominant tallgrasses are sand bluestem (*Andropogon hallii*) and little bluestem (*Schizachyrium scoparium*). Midgrasses present included sideoats grama (*Bouteloua curtipendula*), sand lovegrass (*Eragrostis trichodes*), dropseeds (Sporobolus spp.), sand paspalum (Paspalum strumarium), fall witchgrass (*Digitaria cognata*), hairy grama (*Bouteloua hirsuta*), plains bristlegrass (*Setaria leucopila*), hooded windmillgrass (*Chloris cucullata*) and perennial three-awns (Aristida spp.). Some cool-season grasses occur in small amounts such as needle & thread (Stipa comata). Typically associated forbs include dotted gayfeather (*Liatris punctata*), annual wild buckwheat (*Eriogonum annuum*), queen’s delight (*Stillingia sylvatica*), prairie clover (*Dalea purpurea*), catclaw sensitivebriar (*Mimosa aculeaticarpa* var. biuncifera), gaura (Gaura spp.), and numerous annual forbs. Primary shrub species are sand shinoak (*Quercus havardii*) and sand sagebrush (Artemesia filifolia), with lesser amounts of skunkbush sumac (*Rhus aromatica*), sand plum (*Prunus angustifolia*), and southwestern rabbitbrush (*Chrysothamnus pulchellus*). Nutrient cycling, the water cycle, watershed protection and biological processes are functioning at their peak.

Fire plays an important role in the function of most plains sites, especially the tallgrass communities. Tallgrasses such as sand bluestem and little bluestem are dependent on fire to stimulate them and remove old growth that would accumulate on the soil surface. Fire also suppresses shrubs. Overall, fire helps to keep a balance between the vegetation. Opening up canopies and stimulating forb growth improved wildlife habitat. The deep-rooted species that grow on the site are not easily damaged by fire. Shrubs usually re-sprout, but are suppressed for a time allowing grasses to dominate. In the absence of periodic fire woody plants will slowly increase and with grazing pressure can begin to dominate the site. Practices such as brush management may be necessary to keep the community in balance if periodic fires no longer occur.

Periodic grazing 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. Thus the resilient grassland could re-establish itself and maintain the reference community. Major forces influencing transition from the reference community include continued overgrazing by livestock and the decrease in frequency and intensity of fires. 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.

The productive capacity of this site is moderately high if good management is applied. The tallgrasses are sensitive to overgrazing and will decrease under continuous heavy grazing. Moderate grazing and periodic rest, especially during the mid to late growing season, are necessary to sustain them. Overgrazing causes retrogression. The tallgrasses give way to an increase in midgrasses such as sideoats grama, dropseed species and perennial three-awns. The better quality perennial forbs are replaced with less palatable species such as gaura, western ragweed, and camphorweed.

Annual forbs such as annual wild buckwheat increase. Sand shinoak, sand sagebrush, and skunkbush sumac can increase to >20 percent of the total plant community. The decrease in density and stature of the tallgrass vegetation and increase in density of the woody vegetation brings about a new plant community, a Midgrass/Shrub Community (2.1).

In the Midgrass/Shrub Community (2.1), the transition back to the reference is possible 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 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 abusive grazing continues, a threshold will be crossed to a Shrub Dominant Community (3.1). In this degraded state, typical vegetation will be annuals and western ragweed along with an increase in perennial three-awns, red lovegrass, gummy lovegrass, and sandbur. A significant increase in the canopy of sand sagebrush and sand shinoak can be expected for this plant community. 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 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.

The sandy site is not particularly resistant to heavy grazing but exhibits amazing resilience. If even a small seed source of the tallgrasses remains and some old root crowns are still viable, then recovery is possible with minimal re-seeding. Recovery can occur fairly rapid if the competitive plants are controlled and proper grazing management is applied. Full recovery and maintenance of the reference community 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:

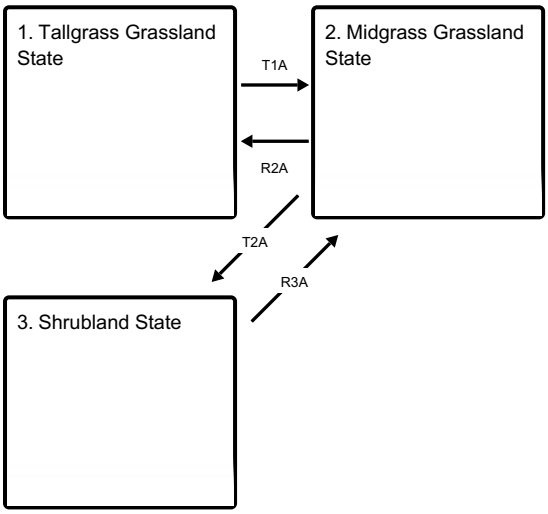
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the model. This information is intended to show what might happen in a given set of circumstances. Local professional guidance should always be sought before pursuing a treatment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

Changes in the structure and composition of the plant community may be due to management and/or natural occurrences. At some point thresholds are crossed as indicated by the lined box on the State and Transition Diagram. This suggests that once changes have progressed to a certain point, the plant community has been altered to the extent that a return to the former state is not possible unless some form of energy is applied. These changes take place on all ecological sites. Some sites support communities that are more resistant to change than others. Also, some sites are more resilient and can 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 brush management to decrease the amount of woody/cacti 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 the desired result.

As it relates to this site, the plant community balance is more fragile than some of the other sites. This balance is necessary for the community to function properly. Tallgrasses are not as resistant to grazing as short and midgrass species. The soil is more fragile since it is sandy and can result in plant and soil disturbance from hoof action. If cover is very poor, wind erosion will occur.

State and transition model

Ecosystem states



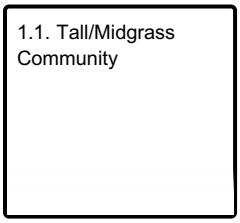
T1A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

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

R3A - Adequate rest from defoliation and removal of woody canopy

State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Midgrass/Shrub Community

State 3 submodel, plant communities

3.1. Shrub Dominant Community

State 1
Tallgrass Grassland State

The Tallgrass Grassland State is a mixture of tall/midgrasses, forbs, and a few woody shrubs. The major tallgrass species are sand bluestem and little bluestem. The midgrasses are sideoats grama, sand lovegrass, sand paspalum, fall witchgrass, hairy grama, dropseed species, perennial three-awns, and hooded windmillgrass. Cool-season grasses include needle & thread. Perennial forbs are present and a few scattered shrubs such as sand sagebrush, sand shinoak, skunkbush and an occasional sand plum thicket and southwest rabbitbrush.

Dominant plant species

- sand sagebrush (*Artemisia filifolia*), shrub
- sand bluestem (*Andropogon hallii*), grass
- little bluestem (*Schizachyrium scoparium*), grass

Community 1.1
Tall/Midgrass Community

Figure 8. 1.1 Tall/Midgrass Community

The interpretive or "reference" plant community for this site is a mixture of tall/midgrasses, forbs, and a few woody shrubs. The major tallgrass species are sand bluestem and little bluestem. The midgrasses are sideoats grama, sand lovegrass, sand paspalum, fall witchgrass, hairy grama, dropseed species, perennial three-awns, and hooded windmillgrass. Cool-season grasses include needle & thread. Perennial forbs are present and a few scattered shrubs such as sand sagebrush, sand shinoak, skunkbush and an occasional sand plum thicket and southwest rabbitbrush. The plant community’s ecological processes are in balance with the environment. Most energy and nutrient cycling is contained in the narrow grass/soil interface and evapo-transpiration is minimal. Maintenance of this community requires continued proper grazing management as well as occasional brush and pest management.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1300	1429	1558
Shrub/Vine	263	291	314
Forb	174	191	202
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1737**	**1911**	**2074**

Figure 10. Plant community growth curve (percent production by month). TX1024, Tall/Midgrass Community. Growth is predominantly tall/midgrasses from April to October with peak growth from May through July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	6	9	21	24	14	6	11	4	2	1

State 2
Midgrass Grassland State

The midgrass/shrub community is dominated by sand sagebrush and skunkbush increasing (>20%) with an occasional yucca plants. The main grasses are sideoats grama, dropseeds, and sand paspalum with increasing amounts of perennial three-awns. Annual forbs and grasses are increasing along with bare ground; production potential reduced.

Dominant plant species

- sand sagebrush (*Artemisia filifolia*), shrub
- sumac (*Rhus*), shrub
- sideoats grama (*Bouteloua curtipendula*), grass

Community 2.1
Midgrass/Shrub Community

Figure 11. 2.1 Midgrass/Shrubs Community

This plant community represents the first phase in the transition of the Midgrass/Shrub Community (2.1) toward the Shrub Dominant Community (3.1). As retrogression proceeds, the tallgrasses give way to an increase in midgrasses such as hooded windmillgrass, mesa and sand dropseed, hairy grama, and fall witchgrass. The better quality forbs are replaced with less palatable species such as gaura and western ragweed. Annual forbs such as annual buckwheat increase. Sand sagebrush, shinoak, and skunkbush along with other invaders such as yucca can increase to >20 percent of the total plant community. The production of vegetation has shifted from mostly herbaceous vegetation to more woody, although the herbaceous vegetation biomass is still the largest amount.

Nutrient cycling, the water cycle, watershed protection and biological functions have changed little. Proper grazing and brush management can easily maintain this phase and prevent the transition toward the Shrub Dominant Community (3.1).

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1009	1121	1233
Shrub/Vine	370	420	482
Forb	135	196	247
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1514**	**1737**	**1962**

Figure 13. Plant community growth curve (percent production by month). TX1036, Midgrass/Shrubs Community. Growth is predominantly midgrasses and shrubs from April through October with peak growth from May through July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	6	16	22	20	10	4	3	6	5	4	2

State 3
Shrubland State

The sand shinoak and sand sagebrush dominates this Shrub Dominant Community. The understory is primarily annual grasses and forbs with a high percentage of bare ground. Very few perennial grasses are remaining. This community has very low production potential.

Dominant plant species

- Havard oak (*Quercus havardii*), shrub
- sand sagebrush (*Artemisia filifolia*), shrub

Community 3.1
Shrub Dominant Community

Figure 14. 3.1 Shrub Dominant Community

The Shrub Dominant Community (3.1) is a shrub community with sand sagebrush and shinoak being the primary woody plants. The under story consists mainly of annual grasses and forbs. There are few perennial grasses remaining. Few of the reference community grasses and forbs are present. Herbaceous forage production is less than half of the reference. The moisture regime is less than normal because of evapo-transpiration losses and

increased bare ground. Nutrient cycling, the water cycle, watershed protection and biological functions have decreased substantially. Major energy and economic inputs are required to change the Shrub Dominant Community (3.1) back to reference. Brush and pest management, prescribed grazing, and perhaps range seeding will be necessary at major expense. This site is not particularly resistant to heavy grazing but exhibits amazing resilience. If even a small seed source of the tallgrasses remains and some old root crowns are still viable, then recovery is possible with minimal re-seeding. Recovery can occur fairly rapid if the competitive plants are controlled and proper grazing management is applied. Full recovery and maintenance of the reference community requires continued proper grazing management as well as occasional brush and pest management.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	560	616	673
Grass/Grasslike	224	336	448
Forb	45	56	67
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**829**	**1008**	**1188**

Figure 16. Plant community growth curve (percent production by month). TX1040, Shrub Dominant Community. Growth is predominately shrubs with annual forbs and grasses from April through October with peak growth from May to July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	9	12	24	18	14	4	5	4	3	0

Transition T1A
State 1 to 2

With heavy continuous grazing, no fires, and woody encroachment of shrubs, the Tallgrass/Midgrass Community will shift to the Midgrass/Shrub Community.

Restoration pathway R2A
State 2 to 1

In the Midgrass/Shrub Community (2.1), the transition back to the reference community is possible with proper grazing management, brush and pest management. Prescribed burning could be used if the conditions allow.

Conservation practices

Brush Management
Integrated Pest Management (IPM)
Prescribed Grazing

Transition T2A
State 2 to 3

Due to heavy continuous grazing, no brush management, and no fires, the Midgrass/Shrub Community will transition to the Shrub Dominant Community.

Restoration pathway R3A
State 3 to 2

If even a small seed source of the tallgrasses remains and some old root crowns are still viable, then recovery is

possible with minimal re-seeding. Recovery can occur fairly rapid if the competitive plants are controlled and proper grazing management is applied. Full recovery and maintenance of the reference community requires continued proper grazing management as well as occasional brush and pest management. This would allow the Shrub Dominant Community to be restored to the Midgrass/Grassland State.

Conservation practices

Brush Management
Integrated Pest Management (IPM)
Prescribed Grazing

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Tallgrasses**			605–729	
	sand bluestem	ANHA	*Andropogon hallii*	336–560	–
	little bluestem	SCSCS	*Schizachyrium scoparium var. scoparium*	336–560	–
2	**Midgrasses**			258–314	
	sideoats grama	BOCU	*Bouteloua curtipendula*	112–224	–
	sand lovegrass	ERTR3	*Eragrostis trichodes*	112–224	–
	thin paspalum	PASE5	*Paspalum setaceum*	112–224	–
3	**Shortgrasses**			174–202	
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	56–112	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	56–84	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	56–84	–
	fall witchgrass	DICO6	*Digitaria cognata*	56–84	–
	gummy lovegrass	ERCU	*Eragrostis curtipedicellata*	56–84	–
	red lovegrass	ERSE	*Eragrostis secundiflora*	56–84	–
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	56–84	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	56–84	–
	silver beardgrass	BOLA2	*Bothriochloa laguroides*	56–84	–
	coastal sandbur	CESP4	*Cenchrus spinifex*	0–56	–
4	**Midgrasses**			168–202	
	spike dropseed	SPCO4	*Sporobolus contractus*	112–168	–
	giant dropseed	SPGI	*Sporobolus giganteus*	112–168	–
5	**Cool-season grasses**			84–95	
	Canada wildrye	ELCA4	*Elymus canadensis*	56–95	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	56–95	–
6	**Shortgrass**			11–17	
	blue grama	BOGR2	*Bouteloua gracilis*	11–17	–
Forb					
7	**Forbs**			174–202	
	Forb, annual	2FA	*Forb, annual*	0–56	–

	Cuman ragweed	AMPS	*Ambrosia psilostachya*	22–56	–
	whitemouth dayflower	COER	*Commelina erecta*	22–56	–
	golden prairie clover	DAAU	*Dalea aurea*	22–56	–
	purple prairie clover	DAPUP	*Dalea purpurea var. purpurea*	22–56	–
	eastern daisy fleabane	ERAN	*Erigeron annuus*	22–56	–
	annual buckwheat	ERAN4	*Eriogonum annuum*	22–56	–
	kisses	GASU2	*Gaura suffulta*	22–56	–
	camphorweed	HESU3	*Heterotheca subaxillaris*	22–56	–
	dotted blazing star	LIPU	*Liatris punctata*	22–56	–
	grassland blazingstar	MEST3	*Mentzelia strictissima*	22–56	–
	Nuttall's sensitive-briar	MINU6	*Mimosa nuttallii*	22–56	–
	queen's-delight	STSY	*Stillingia sylvatica*	22–56	–
	prairie spiderwort	TROC	*Tradescantia occidentalis*	22–56	–
Shrub/Vine					
8	**Shrubs/Vines**			247–291	
	sand sagebrush	ARFI2	*Artemisia filifolia*	224–291	–
	Havard oak	QUHA3	*Quercus havardii*	224–291	–
9	**Shrubs/vines**			17–22	
	southwestern rabbitbrush	CHPU4	*Chrysothamnus pulchellus*	11–22	–
	Oklahoma plum	PRGR	*Prunus gracilis*	11–22	–
	fragrant sumac	RHAR4	*Rhus aromatica*	11–22	–

Animal community

The animal species that utilize this site as habitat are mainly small mammals, songbirds, and traditional game species like bobwhite and scaled quail, mule deer, pronghorn antelope, and lesser prairie chicken. The combination of grasses, forbs, and woody shrubs provide suitable habitat for all the above species, at least at some time during the year. Predators such as coyotes and bobcats may utilize the site for hunting prey and to hide during the day. If the site is a shrub dominant community, then diversity is decreased and the wildlife habitat will usually be less desirable.

Hydrological functions

This site captures nearly 100 percent of the water that falls on it. The sandy soil infiltrates water rapidly. There is negligible runoff. Some water will percolate past the root zone and find its way into shallow aquifers. This site and the Sand Hills (Dune) site are primary recharge areas.

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

1. Archer S. 1994. Woody plant encroachment into southwestern grasslands and savannas: rates, patterns and proximate causes. In Ecological implications of livestock herbivory in the West, Ed M Vavra, W Laycock, R Pieper, pp13-68, Denver, CO: society for Range Management
2. Gould F. 1978. Common Texas Grasses: an illustrated guide. College Station, TX: Texas A & M Press.
3. Hatch, Brown and Ghandi, Vascular Plants of Texas (An Ecological Checklist)
4. Heischmidt RK, Stuth, Eds. 1991 Grazing Management: an ecological perspective. Portland OR: Timberline Press
5. North Rolling Plains RC&D, NRCS, and GLCI. 2006 edition. Common Rangeland Plants of the Texas Panhandle.
6. Scifres CJ, Hamilton WT. 1993. Prescribed burning for brushland management: the South Texas example. College Station, TX: Texas A & M Press.
7. Natural Resources Conservation Service - Range Site Descriptions
8. USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database

The following individuals assisted with the development of this site description:
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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.

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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:** 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:** 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):** Not resistant to surface erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Fine sand single grain surface and very low 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 moderate interspaces should make rainfall impact minimal. This site has rapid permeability, runoff is slow and available water holding capacity is low.

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

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

    Dominant: Warm-season tallgrasses >

    Sub-dominant: Warm-season midgrasses >

    Other: Cool-season grasses > Forbs > Shrubs/Vines

    Additional:

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 minimal.

14. **Average percent litter cover (%) and depth (in):** Litter is dominantly herbaceous.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,500 to 2,000 pounds per acre.

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 Sand shin oak can become invasive.

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