USDA Natural Resources Conservation Service

Ecological site R077CY034TX
Sand Hills 16-21" PZ

Last updated: 9/11/2023
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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.

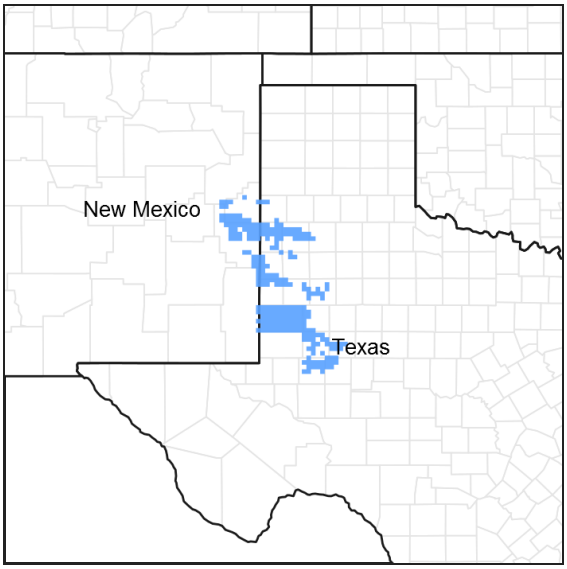


Figure 1. Mapped extent

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): 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 windblown, sandy soils on dunes. The reference vegetation consists of deep-rooted tallgrasses with shrubs, midgrasses and forbs. These sites can be very sensitive to long dry periods. If grazed, careful management should be applied to prevent blowouts as the soils are very susceptible to wind erosion.

Associated sites

R077CY052NM	**Loamy Sand** The Loamy Sand site is on nearly level to gently sloping plains. These sites are on lower landscape positions and adjacent to and intermingled with the Sand Hills site. Midgrasses, tallgrasses, and shrubs dominate these sites.
R077CY035TX	**Sandy 16-21" PZ** The Sandy site is on plains, dunes, and interdunes. Sandy sites are on lower landscape positions and intermingled with Sand Hills. Midgrasses, tallgrasses, and shrubs dominate these sites.
R077CY036TX	**Sandy Loam 16-21" PZ** The Sandy Loam site is on plains and playa slopes. These sites are on lower landscape positions and adjacent to and intermingled with the Sand Hills site. Midgrasses and shortgrasses dominate on these sites.

Similar sites

R077DY045TX	**Sand Hills 12-17" PZ** These sites have very deep sandy soils on windblown sand dunes. Reference vegetation consists of tall and midgrasses, forbs and shrubs. Mean annual precipitation is lower (15 to 17 inches) and this site is less productive than the Sand Hills site in MLRA 77C. In the absence of periodic fire, shrub canopy may increase.
R077AY011TX	**Sand Hills 16-22" PZ** These sites have very deep sandy soils on windblown sand dunes. Reference vegetation consists of tall and midgrasses, forbs and shrubs. In the absence of periodic fire, shrub canopy may increase.
R077BY020TX	**Sand Hills 12-17" PZ** These sites have very deep sandy soils on windblown sand dunes. Reference vegetation consists of tall and midgrasses, forbs and shrubs. In the absence of periodic fire, shrub canopy may increase.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Quercus havardii* (2) *Artemisia filifolia*
Herbaceous	(1) *Andropogon hallii* (2) *Calamovilfa gigantea*

Physiographic features

This site is an upland with very sandy, undulating to hilly topography and consists of very deep, excessively drained, rapidly permeable eolian deposits. The soils are on duned ridges on convex uplands and sideslopes or plains. Due to the sandy nature of the material, very little runoff is generated and since these soils generally occur on the highest positions on the landscape, no runoff is received from other sites.

Table 2. Representative physiographic features

Landforms	(1) Plateau > Dune (2) Plateau > Hill
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	1,036–1,463 m
Slope	1–30%
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)	157-189 days
Freeze-free period (characteristic range)	189-206 days
Precipitation total (characteristic range)	457-483 mm
Frost-free period (actual range)	152-200 days
Freeze-free period (actual range)	184-212 days
Precipitation total (actual range)	432-483 mm
Frost-free period (average)	176 days
Freeze-free period (average)	199 days
Precipitation total (average)	457 mm

Climate stations used

- (1) BIG SPRING [USW00023041], Big Spring, TX
- (2) DENVER CITY [USC00412408], Denver City, TX
- (3) PORTALES [USC00297008], Portales, NM
- (4) ARCH [USC00290525], Portales, NM
- (5) MULESHOE 19 S [USW00003054], Muleshoe, TX
- (6) PLAINS [USC00417074], Plains, TX
- (7) LITTLEFIELD [USC00415265], Littlefield, TX
- (8) 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 soils for the Sand Hills ecological site have undulating to rolling, deep fine sands with high water infiltration rates and low water storage capacity. The soils have no structure and no well defined horizons; however, some soils may contain lamellae of generally finer textured material which may affect infiltration. Fertility is very low but plant available water is high. Surface temperatures on bare sand are very high and plant establishment is difficult.

Wind erosion is an ever present problem unless cover is adequate to stabilize the fragile sands.

Major Soil Taxonomic Units correlated to this site include: Milsand fine sand and loamy fine sand, and Nutivoli 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) Sandy
Drainage class	Excessively drained
Permeability class	Rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	6.1–6.35 cm
Calcium carbonate equivalent (0-101.6cm)	0–8%
Electrical conductivity (0-101.6cm)	0–1 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.8
Subsurface fragment volume <=3" (0-101.6cm)	0%
Subsurface fragment volume >3" (0-101.6cm)	0%

Ecological dynamics

The Sand Hills ecological site is unique in many respects. The site developed in wind-worked alluvial or eolian deposits. The lack of soil development and recent climatic conditions played a major role in plant community development. Typically, these are developmentally very young soils. Areas of the Sand Hills site now supporting a plant community were bare dunes as recently as 50 to 60 years ago. Other sites appear to be more mature and support a more diverse and seemingly stable plant community. Different stages of plant community development can be observed over the range of the site. The reference plant community for this site is difficult to describe because of the different ages of sediments, and the stage of development of the plant community. The age of soil deposition and stability appear to be major factors in this process.

The Tallgrass/Shrubs Community (1.1) is a mixture of tallgrasses (50-60 percent), shrubs (35-45 percent) and perennial forbs (10-15 percent). The amount of annual forbs found is dependent on the moisture situation in a given year. The dominant tallgrasses are sand bluestem (*Andropogon hallii*), giant sandreed (*Calamovilfa gigantea*), little bluestem (Schizachrium scoparium) and the taller dropseed species (Sporobolus spp). Lesser amounts of switchgrass (*Panicum virgatum*) and Indiangrass (*Sorghastrum nutans*) are found under more favorable moisture conditions. Usually Indiangrass occurs where finer textures occur in the subsoil. A good variety of forbs exist but the amount varied greatly from year to year. The more commonly found forb species are queen’s delight (*Stillingia sylvatica*), gaura (Gaura spp.), and annual wild buckwheat (*Eriogonum annuum*). The major shrubs are sand shinoak (Quercus harvardii), sand sagebrush (*Artemisia filifolia*), and skunkbush sumac (*Rhus aromatica*). Lesser amounts of sand plum (*Prunus angustifolia*), and southwestern rabbit brush (*Chrysothamnus pulchellus*) are usually present in the Texas portion of the MLRA. The woody shrubs are more stable from year to year and can better

withstand the climatic extremes; therefore it is probable that shrubs were a major component of the historic plant community. In dryer years the grasses and forbs decline somewhat and in wet years forb growth can be profuse. With abundant early spring moisture, annual wild buckwheat can be the dominant herbaceous plant present. With good summer moisture, the taller grasses become more visible and produce a larger portion of total biomass. The environment in the Sand Hills is harsh and those species that are deep rooted, soil stabilizing and drought tolerant have the advantage. The shrubs and the taller grasses, along with certain tap-rooted forbs best fit that description.

The plant community on this site is influenced by moisture and aspect. North and east aspects will support a slightly different plant community than the south and west aspects. Production levels can be slightly higher on the north and east aspects.

Fire no doubt plays a part in the sites' ecology, as is true of nearly all plains sites. Since cover is sparser than adjacent sites and bare areas exist throughout the site, fuel continuity may not have always been sufficient for a complete burn. There are historical accounts of fires having burned up to the Sand Hills and dying out. There were undoubtedly times when the site did burn and present day observations bear this out. These results are varied. If the soil is bare in early spring and moisture is deficient then some post-burn erosion is likely. The resulting blowing sand can cut off plant bases and seedlings. However, if post-burn rainfall is adequate, erosion can be minimal, and recovery can take place. Frequently, the site requires three or four growing seasons to reach equilibrium. Biomass production is reduced for at least three years. A moderate shift toward grass vegetation with shrub suppression lasting several years will usually result.

Abusive grazing with domestic livestock for prolonged periods will usually see the most palatable plants pressured severely. As retrogression proceeds, this site will move towards the Shrub/Midgrass Community (2.1). Tallgrasses decline and midgrass species increase. The shrub component increases dramatically to >60 percent. Heavy disturbance by hoof action to the soil surface can cause an increase in annual species. There will be a marked increase in western ragweed, dropseed species, perennial three-awns (Aristida spp.), and a wide variety of lower successional species. Sand shinoak, sand sagebrush and skunkbush sumac will increase dramatically. Some sites may have an increase in yucca (*Yucca glauca*) plants. Bare areas may become more numerous and wind erosion will increase.

Shrubs are only slightly utilized during the grazing/browsing process, and little pressure is placed upon them. The balance between grass, forbs, and shrubs is rather delicate; and over utilization of the more palatable species favors shrubs. Diversity will be less than under reference conditions. In this phase, ecological processes have changed somewhat, but the pathway back toward the reference community can be initiated through prescribed grazing and selective brush management. Prescribed burns require the utmost caution. Generally there is not enough fine fuel to carry an effective fire. Other tools can be used with less risk. In appropriate conditions careful use of herbicides can suppress shrub growth without destabilizing the site. Care should be taken to avoid treating the tops of dunes and areas of poor cover.

If abusive grazing continues, along with periodic droughts, retrogression will move towards a Shrub Dominant Community (3.1). In extreme cases, shrubs will dominate with mainly annual forbs and grasses being present. Sand shinoak, sand sagebrush, and skunkbush sumac increase. Some sand hills sites may see a major increase in yucca plants. Numerous bare areas will be scattered throughout the site. The rolling mini-dune areas may begin to show signs of wind erosion from the lack of deep-rooted grass cover. The plant community can become so degraded that it cannot recover without extensive energy and management inputs. At this point, a major threshold has been crossed. Restoration of the Shrub Dominant Community (3.1) requires re-seeding, prescribed grazing (3 - 5 consecutive years deferment during the growing season), and extensive brush and pest management.

The shrub dominant community is generally stable. However, plant diversity is important to ecological processes, and in the management of the site for wildlife. The state of the plant community certainly influences the quality of habitat for quail, pronghorn and mule deer frequenting the site. All of these species prefer a mixture of grass, forbs and shrubs. A variety of shrubs, tallgrasses, and forbs will be more beneficial for wildlife habitat and livestock grazing, and will aid in the function of the ecological processes such as nutrient cycling and the hydrological cycle.

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.

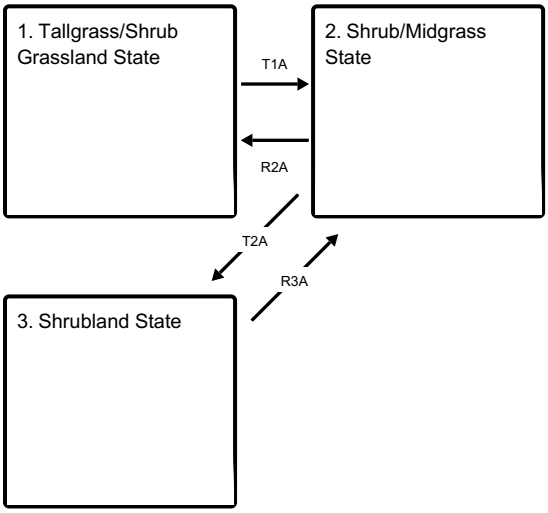
Changes in the structure and composition of the plant community may be due to management and/or natural occurrences. At some point thresholds are crossed as indicated by the lined box on the State and Transition Diagram. This suggests that once changes have progressed to a certain point, the plant community 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.

The plant community balance of this site is more fragile than some of the short grass sites. This balance is necessary for the community to function properly. Tall grasses are not as resistant to grazing as short and mid grass 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 TRANSITIONAL PATHWAYS: (DIAGRAM)

State and transition model

Ecosystem states



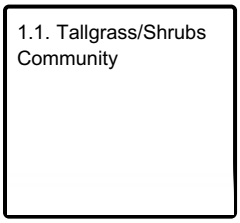
T1A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

R2A - Adequate rest from defoliation and removal of woody canopy, 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. Shrub/Midgrass Dominant Community

State 3 submodel, plant communities

3.1. Shrub Dominant Community

State 1
Tallgrass/Shrub Grassland State

The reference plant community is a mixture of tallgrasses (50-60 percent), shrubs (35-45 percent), and perennial forbs (10-15 percent). The aspect also plays a role in the plant composition: north and easterly aspects were slightly more productive than the south and westerly aspects. Warm-season plants dominate the site. The major grass species are sand bluestem, little bluestem, and giant sandreed. There is a good variety of annual and perennial forbs. Sand shinoak, sand sagebrush, and skunkbush sumac are scattered throughout in a patchy pattern rather than a continuous canopy.

Dominant plant species

- sand bluestem (*Andropogon hallii*), grass
- giant sandreed (*Calamovilfa gigantea*), grass

Community 1.1
Tallgrass/Shrubs Community

Figure 8. 1.1 Tallgrass/Shrub Community

The reference plant community is a diverse mixture of tallgrasses (50-60 percent), shrubs (35-45 percent), and perennial forbs (10-15 percent). There was a considerable range in the actual composition both within and among sites. The aspect also played a role in the plant composition: north and easterly aspects were slightly more productive than the south and westerly aspects. The site has moderate diversity and in a well-managed state it can be moderately productive. Warm-season plants dominate the site. The major grass species are sand bluestem, little bluestem, and giant sandreed. There is a good variety of forbs, both annual and perennial. Queen’s delight, annual wild buckwheat, and gaura are most prevalent. Sand shinoak, sand sagebrush, and skunkbush sumac are scattered throughout in a patchy pattern rather than a continuous canopy. The community’s ecological processes are in balance with the environment.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1020	1239	1457
Shrub/Vine	392	476	560
Forb	157	191	224
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1569**	**1906**	**2241**

Figure 10. Plant community growth curve (percent production by month). TX1038, Tallgrass/Shrub Community. Growth is predominately tall and midgrasses with scattered shrubs from April to October with peak growth from May to July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	4	14	22	21	18	10	5	2	0

State 2
Shrub/Midgrass State

The Shrub/Midgrass Dominant Community (2.1) is dominated by shrubs (50 to 60+ percent) such as sand shinoak, sand sagebrush, and skunkbush sumac. Some sand hills sites may see an invasion of yucca plants. Perennial grasses (mainly midgrasses) and numerous annual/perennial forbs make up about 40 percent of the vegetation. Total vegetative production is decreasing and diversity is much less than the reference.

Dominant plant species

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

Community 2.1
Shrub/Midgrass Dominant Community

Figure 11. 2.1 Shrub/Midgrass Dominant Community

The Shrub/Midgrass Dominant Community (2.1) is dominated by shrubs (50 to 60+ percent) such as sand shinoak, sand sagebrush, and skunkbush sumac. Some sand hills sites may see an invasion of yucca plants. Perennial grasses (mainly midgrasses) and numerous annual/perennial forbs make up about 40 percent of the vegetation. Total vegetative production is decreasing and diversity is much less than the reference. Bare ground is increasing as well. Quail, deer, and prairie chickens still utilize the site. However, the quality of habitat would be improved if the

shrub component were reduced. Nutrient and energy cycling shifts toward woody plants and evapo-transpiration losses increase. The site offers limited forage production for livestock. There is usually a sufficient seed source and dormant root crowns of the tallgrasses still remaining to generate a good response to reducing the shrub competition. Without brush management and proper grazing, the woody species will continue to increase. Careful grazing management will have to accompany any sort of brush management efforts.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	986	1194	1401
Grass/Grasslike	185	213	247
Forb	62	78	90
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1233**	**1485**	**1738**

Figure 13. Plant community growth curve (percent production by month). TX1039, Shrub/Midgrass Dominant Community. Growth is predominately shrubs with midgrasses 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	8	12	24	20	15	4	5	3	2	0

State 3
Shrubland State

If heavy continuous grazing continues, along with periodic droughts, retrogression will move towards a Shrub Dominant Community (3.1). In extreme cases, shrubs will dominate with mainly annual forbs and grasses being present. Sand shinoak, sand sagebrush, and skunkbush sumac increase. Some sand hills sites may see a major increase in yucca plants. Numerous bare areas will be scattered throughout the site. The rolling mini-dune areas may begin to show signs of wind erosion from the lack of deep-rooted grass cover.

Dominant plant species

- oak (*Quercus*), shrub
- sumac (*Rhus*), 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) has greater than 65% woody canopy of sand shinoak, sand sagebrush, and skunkbush sumac. Sand hills sites that have been invaded by yucca plants may see a major increase in plant density. Annual forbs and grasses make up approximately 30% of the total. Numerous bare areas are found scattered throughout the site. Winter and early spring winds cause erosion in the bare places where annual vegetation prevails. Productivity is low and so is plant diversity. The potential for livestock grazing is low and little wildlife benefits other than cover exist. A definite threshold has been crossed and the shrubs will remain dominant unless high-energy inputs are applied. Careful brush and pest management are needed to reduce the shrub dominance and provide a release of desirable grasses and forbs. Reseeding on this site is difficult and not usually successful. Two growing seasons of complete rest would improve the amount of vegetative cover and would probably be a good first step. Then careful brush management to reduce sand shinoak, sand sagebrush, skunkbush sumac, and possibly yucca; as well as pest management to control annual weed competition should be applied.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	1042	1267	1480
Forb	39	56	73
Grass/Grasslike	28	39	50
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1109**	**1362**	**1603**

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

Heavy or even moderately heavy continuous grazing with domestic livestock for prolonged periods will usually see the most palatable plants pressured severely. No fire and no brush management can also assist in the transition from a Tallgrass/Shrub Grassland State to a Shrub/Midgrass State.

Restoration pathway R2A
State 2 to 1

With Prescribed Grazing and Brush Management (reduction and suppression but not eradication purposes) conservation practices, the Shrub/Midgrass State can be restored to the Tallgrass/Shrub Grassland State.

Conservation practices

Brush Management
Prescribed Grazing

Transition T2A
State 2 to 3

Without brush management and proper grazing, the woody species will continue to increase. No pest management and no fires will also contribute to the transition from the Shrub/Midgrass State to the Shrubland State.

Restoration pathway R3A
State 3 to 2

Careful brush and pest management are needed to reduce the shrub dominance and provide a release of desirable grasses and forbs. Reseeding on this site is difficult and not usually successful. One to three years of complete rest would improve the amount of vegetative cover and would probably be a good first step. Then careful brush management to reduce sand shinoak, sand sagebrush, skunkbush sumac, and possibly yucca; as well as pest management to control annual weed competition should be applied.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

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**			628–897	
	sand bluestem	ANHA	*Andropogon hallii*	392–560	–
	little bluestem	SCSC	*Schizachyrium scoparium*	157–224	–
	giant sandreed	CAGI3	*Calamovilfa gigantea*	78–112	–
2	**Midgrasses**			123–179	
	sideoats grama	BOCU	*Bouteloua curtipendula*	56–168	–
	sand lovegrass	ERTR3	*Eragrostis trichodes*	56–168	–
	thin paspalum	PASE5	*Paspalum setaceum*	28–84	–
3	**Shortgrasses**			157–224	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	22–112	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	22–56	–
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	22–56	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	22–56	–
	coastal sandbur	CESP4	*Cenchrus spinifex*	0–56	–
	fall witchgrass	DICO6	*Digitaria cognata*	22–56	–
	gummy lovegrass	ERCU	*Eragrostis curtipedicellata*	22–56	–
	red lovegrass	ERSE	*Eragrostis secundiflora*	22–56	–
4	**Cool-season grasses**			34–45	
	Canada wildrye	ELCA4	*Elymus canadensis*	22–45	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	22–45	–
5	**Tallgrasses**			34–45	
	switchgrass	PAVI2	*Panicum virgatum*	22–45	–
	Indiangrass	SONU2	*Sorghastrum nutans*	22–45	–
6	**Midgrasses**			45–67	
	spike dropseed	SPCO4	*Sporobolus contractus*	22–67	–
	giant dropseed	SPGI	*Sporobolus giganteus*	22–67	–
Forb					

Forb					
7	**Forbs**			157–224	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	28–56	–
	golden prairie clover	DAAU	*Dalea aurea*	28–56	–
	purple prairie clover	DAPU5	*Dalea purpurea*	28–56	–
	beeblossom	GAURA	*Gaura*	28–56	–
	bluebowls	GIRI3	*Giliastrum rigidulum*	28–56	–
	camphorweed	HESU3	*Heterotheca subaxillaris*	28–56	–
	dotted blazing star	LIPU	*Liatris punctata*	28–56	–
	grassland blazingstar	MEST3	*Mentzelia strictissima*	28–56	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	28–56	–
	evening primrose	OENOT	*Oenothera*	28–56	–
	gilia beardtongue	PEAM	*Penstemon ambiguus*	28–56	–
	queen's-delight	STSY	*Stillingia sylvatica*	28–56	–
	annual buckwheat	ERAN4	*Eriogonum annuum*	0–34	–
	Forb, annual	2FA	*Forb, annual*	0–34	–
Shrub/Vine					
8	**Shrubs**			359–516	
	sand sagebrush	ARFI2	*Artemisia filifolia*	224–516	–
	Havard oak	QUHA3	*Quercus havardii*	224–516	–
	fragrant sumac	RHAR4	*Rhus aromatica*	224–516	–
9	**Shrubs**			34–45	
	southwestern rabbitbrush	CHPU4	*Chrysothamnus pulchellus*	34–45	–
	Oklahoma plum	PRGR	*Prunus gracilis*	34–45	–

Animal community

The animal species that utilize this site as habitat are mainly small mammals, song birds, 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 that occur provide suitable habitat for all the above species. Water in the form of surface ponds, springs, or flowing streams is not usually present. Species that require daily watering may move in and out of the site. 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

Almost no water moves off site. Precipitation infiltrates very rapidly. Water in excess of plant needs percolates into shallow aquifers and may manifest itself as spring flow further down in the geologic formation. Recharge may be the greatest contribution the site makes in the water cycle.

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

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.
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Contributors

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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.

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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):** 35-40%

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 sanc single grained 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: shrubs >

    Additional: forbs > cool-season grasses

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Growth 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):** 1,300 - 1,800 lbs 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 shinoak can become invasive.

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.