

Ecological site R077BY020TX Sand Hills 12-17" PZ

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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.

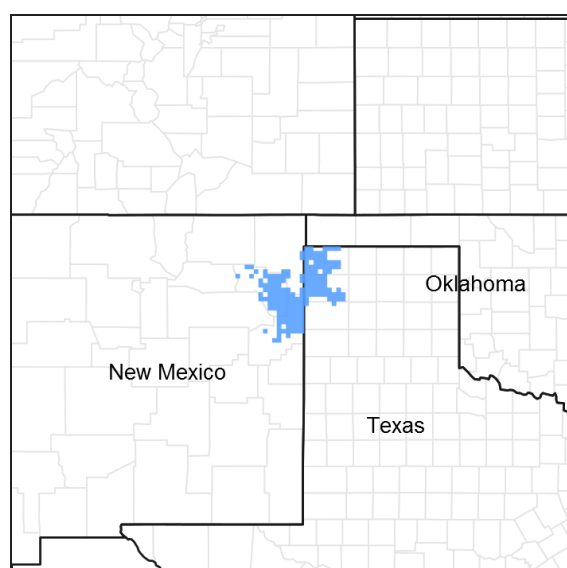


Figure 1. Mapped extent

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): 077B–Southern High Plains, Northwestern Part

This unit is characterized by nearly level to gently sloping plains with a minimal number of playa depressions and moderately sloping breaks along drainageways. Loamy and sandy soils are generally deep and occur in a mesic soil temperature regime and ustic soil moisture regime bordering on aridic. Current land use is dominantly rangeland with minor 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 sandy soils on dunes. the reference vegetation is a mix of tallgrasses and shrubs with some midgrasses and forbs. During times of favorable precipitation, these sites can produce an abundance of vegetation. However, due to the mature of the coarse soils they are not very drought tolerant. Careful grazing management is required to maintain adequate soil cover and prevent wind erosion. In the absence of fire or other brush management, woody canopy cover may increase.

Associated sites

R077BY658TX	Sandy 12-17" PZ Generally adjacent and downslope of the Sandhills site. The soils are loamy sand in texture. Tallgrasses dominate by has a good mixture of midgrasses on this site. More productive than the Sandhills site.
R077BY725TX	Draw 12-17" PZ Generally adjacent and downslope of the Sandhills site. The soils are loamy to sandy in texture. Midgrasses dominate but some tallgrasses can be found on this site. More productive than the Sandhills site.
R077BY021TX	Sandy Loam 12-17" PZ Generally adjacent and downslope of the Sandhills site. The soils are sandy loam in texture. Midgrasses dominate but some tallgrasses can be found on the sandy loam site. More productive than the Sandhills site.

Similar sites

R077BY658TX	Sandy 12-17" PZ Generally adjacent and downslope of the Sandhills site. The soils are sandy in texture. Tallgrasses dominate by has a good mixture of midgrasses on this site. More productive than the Sandhills site.
R077AY011TX	Sand Hills 16-22" PZ This site has very deep sandy soils like the Sandhills site in MLRA 77B. Mean annual precipitation is higher (16 to 22 inches). Tallgrasses dominate but some midgrasses can be found on this site. More productive than the Sandhills site in MLRA 77B.
R077AY666TX	Sandy 16-22" PZ This site has very deep loamy sand soils similar to the Sandhills site in MLRA 77B. Mean annual precipitation is higher (16 to 22 inches). Midgrasses dominate by has a good mixture of tallgrasses on this site. More productive than the Sandhills site in MLRA 77B.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia filifolia</i> (2) <i>Rhus trilobata</i>
Herbaceous	(1) <i>Andropogon hallii</i> (2) <i>Schizachyrium scoparium</i>

Physiographic features

This is an upland site with very sandy, undulating to strongly rolling 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
Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	1,128–1,798 m
Slope	1–20%
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)	140-147 days
Freeze-free period (characteristic range)	169-172 days
Precipitation total (characteristic range)	406-432 mm
Frost-free period (actual range)	139-148 days
Freeze-free period (actual range)	168-175 days
Precipitation total (actual range)	406-457 mm
Frost-free period (average)	144 days
Freeze-free period (average)	171 days
Precipitation total (average)	432 mm

Climate stations used

- (1) CLAYTON MUNI AIR PK [USW00023051], Clayton, NM
- (2) DALHART 6 SW [USC00412235], Hartley, TX
- (3) AMISTAD 5 SSW [USC00290377], Amistad, NM
- (4) ROSEBUD 7NW [USC00297585], Mosquero, NM
- (5) MCCARTY RCH [USC00295516], Nara Visa, NM

Influencing water features

Infiltration of precipitation into the soil is rapid and even small rainfall events can supply plant available moisture. No surface water features are present. In isolated places near streams, there may be very small areas where the water table is within a few feet of the surface. With significant rainfall events, some recharge to the water table may occur from this site.

Wetland description

None.

Soil features

This ecological site has 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. 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: Valentine fine sand, Valerian fine sand and Visa fine

sand.

Table 4. Representative soil features

Parent material	(1) Eolian deposits—igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sand
Family particle size	(1) Sandy (2) Loamy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Rapid to very rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	0–2%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
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 has had a major influence on the plant community development. As a rule, these are very young soils developmentally. In fact, some areas of the Sand Hills site now supporting a plant community were bare dunes as recently as 50 to 60 years ago. On the other hand, some sites appear to be more mature and support a more diverse plant community that appears to be more stable. So, different stages of plant community development can be observed from one place to another. Describing an assumed historic climax plant community for this site is difficult because of the different ages of sediments, and the stage of development of the plant community. It may be that the age of deposition and soil stability are major factors in this process. For the purposes of a site description, it is assumed that the more diverse plant community will be the reference plant community for the site.

The Tallgrass/Shrub Community (1.1) is a mixture of tallgrasses (50-60%), shrubs (35-45%) and perennial forbs (10-15%). A varying amount of annual forbs can be found depending 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*) can be found where moisture conditions are slightly more favorable. A good variety of forbs exists but the amount varies greatly from year to year. The more commonly found forb species are queen's delight (*Stillingia sylvatica*), gaura (*Gaura* spp.), western ragweed (*Ambrosia psilostachya*), camphorweed (*Heterotheca subaxillaris*), sand lilly (*Mentzelia strictissima*), and annual wild buckwheat (*Polgenum convolvulus*). The major shrubs were sand sagebrush (*Artemisia filifolia*) and skunkbush sumac (*Rhus aromatica*). Lesser amounts of sand plum (*Prunus angustifolia*), yucca (*Yucca glauca*) and southwestern rabbitbrush (*Chrysothamnus pulchellus*) were usually present. 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 the 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.

Natural fire no doubt played a part in the sites ecology, as is true of nearly all plains sites. Since cover is sparse and bare areas exist throughout, especially in dry years, 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 wildfires have been observed during the present day and the results noted. These results are mixed. Some active erosion will certainly take place postburn, especially if moisture is deficient and the soil is bare in early spring. Many plant bases and seedlings are cut off by blowing sand. However, if rainfall is adequate postburn, erosion can be minimal, and recovery can and will take place. It is common for recovery to take 3 growing seasons and possibly 4 to reach equilibrium. Biomass is reduced for at least 3 years, but after that, a moderate shift toward grass vegetation with shrub suppression that last several years will usually result.

Heavy or even moderately heavy continuous 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/Annuals Community (2.1). Tallgrasses will decline and midgrass species will increase along with a dramatic increase in the shrub component. Shrubs comprise of greater than 60 percent production, grasses less than 25 percent production, and forbs less than 15 percent production. 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, three-awns, and a wide variety of lower successional species. Sand sagebrush and skunkbush will increase dramatically. On some sand hills sites, yucca may begin to increase. Bare areas will become more numerous and wind erosion will increase.

During the grazing/browsing process, the shrubs may be utilized somewhat, but little pressure is placed upon them. The balance between grass, forbs and shrubs is rather delicate, and over utilization of the more palatable species will most assuredly favor the shrubs. Production of vegetation has shifted from mostly herbaceous to more woody. The plant community will be less diverse than the reference community. In this phase, ecological processes have changed somewhat, but the pathway back toward the reference can be initiated through prescribed grazing, selective brush and pest management. The use of prescribed fire should be done with the utmost care on this site; generally there is not enough fine fuel to carry an effective fire. There are other tools that can be used with less risk. Very careful use of herbicides can sometimes be used to suppress shrub growth without destabilizing the site. Care should be taken to avoid treating the tops of dunes and areas of poor cover. Pest Management may be necessary to reduce competition from increased annuals.

If abusive grazing continues, along with periodic droughts, retrogression will move towards a Shrub/Annuals Community (3.1). In extreme cases, shrubs will dominate with mainly annual forbs and grasses being present. Sand sagebrush and skunkbush canopy will continue to increase, on some sites yucca may increase and become a high percentage of the total plant community. Shrubs encompass approximately 70 percent annual production while forbs compose of 30 percent annual production. Numerous bare areas will be scattered throughout the site. The rolling mid-dunes areas may begin to show signs of wind erosion from the lack of deep rooted grass cover. The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs; a major threshold has been crossed. Restoration of the Shrub/Annuals Community requires re-seeding, prescribed grazing (4 to 5 consecutive years deferment during the growing season) as well as extensive brush and pest management. Re-seeding will be difficult on this site due to the erosive nature of the soils and a poor soil/plant moisture relationship.

The Shrub/Annuals Community is generally a stable community but a diversity of plant species is desirable when considering all of the ecological processes, and in the management of the site for wildlife. There are several species of wildlife that frequent the site and the state of the plant community certainly influences the quality of habitat for quail, pronghorn and mule deer. 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, 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:

Narrative:

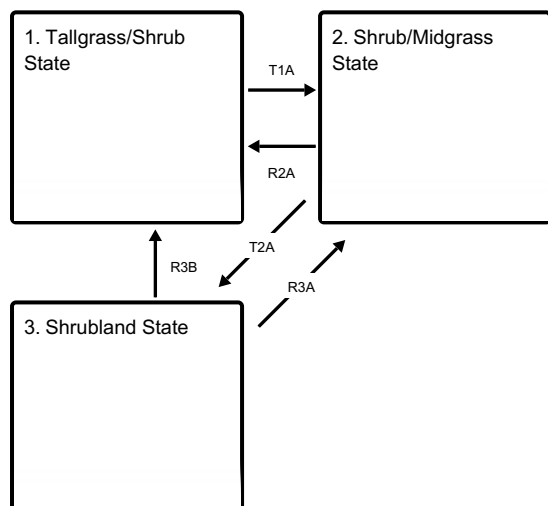
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. 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. As it relates to this site, the plant community balance is more fragile than some of the short grass sites are. 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 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

R3B - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

R3A - Adequate rest from defoliation and removal of woody canopy

State 1 submodel, plant communities

1.1. Tallgrass/Shrub
Dominant Community

State 2 submodel, plant communities

2.1.
Shrub/Midgrass/Annua
ls Community

State 3 submodel, plant communities

3.1. Shrub/Annuals
Community

State 1

Tallgrass/Shrub State

The Tallgrass/Shrub Community (1.1) is a mixture of tallgrasses (50-60%), shrubs (35-45%) and perennial forbs (10-15%). A varying amount of annual forbs can be found depending on the moisture situation in a given year. The dominant tallgrasses are sand bluestem, giant sandreed, little bluestem and the taller dropseed species. A good variety of forbs exists but the amount varies greatly from year to year. The major shrubs are sand sagebrush and skunkbush sumac. 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 reference plant community.

Community 1.1

Tallgrass/Shrub Dominant Community



Figure 8. 1.1 Tallgrass/Shrub Dominant Community

The reference plant community is a diverse mixture of tallgrasses (50-60%), shrubs (35-45%), and perennial forbs (10-15%). There is a considerable range in the actual composition from one part of the site to another and from site to site. 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, gaura and sand lily are

most prevalent. Sand sagebrush and skunkbush sumac are scattered throughout in a patchy pattern rather than a continuous canopy. Some Sand Hills sites may have small amounts of sand plum, southwest rabbitbrush and yucca plants.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1121	1345	1569
Shrub/Vine	224	263	303
Forb	67	84	101
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	1412	1692	1973

Figure 10. Plant community growth curve (percent production by month). TX0766, Tallgrass/Shrub Community. Tallgrasses and shrubs dominate the site..

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

As retrogression proceeds, this site will move towards the Shrub/Midgrass/Annuals Community (2.1). Tallgrasses will decline and midgrass species will increase along with a dramatic increase in the shrub component. Shrubs comprise of greater than 60 percent production, grasses less than 25 percent production, and forbs less than 15 percent production. 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, three-awns, and a wide variety of lower successional species. Sand sagebrush and skunkbush will increase dramatically. On some sand hills sites, yucca may begin to increase. Bare areas will become more numerous and wind erosion will increase.

Community 2.1
Shrub/Midgrass/Annuals Community



Figure 11. 2.1 Shrub/Midgrass/Annuals Community

This community represents the first phase in the transition of the Shrub/Midgrasses/Annuals Community phase (2.1) towards the Shrubs/Annuals phase (3.1). The plant community is dominated by shrubs (>60%) such as sand sagebrush and skunkbush, with increasing amounts of yucca. The remaining annual production is approximately (25%) perennial grasses (mainly midgrasses) and numerous annual/perennial forbs (>15%). Higher percentage of bare ground also exists. This phase is much less diverse than the reference plant community and total production

and diversity is somewhat less. Quail, mule deer and antelope still utilize the site. The quality of habitat would be improved if the shrub component was reduced. Nutrient and energy cycling has shifted toward woody plants and evapo-transpiration losses have increased. The site is limited in forage production for livestock. There is usually a sufficient seed source and dormant root crowns of some of the tallgrasses are still remaining and the response to reducing the competition from shrubs will usually be good. Without brush management and proper grazing, the woody species will continue to thicketize. Careful grazing management will have to accompany any sort of brush management efforts. Prescribed burning is generally not an option in this phase due to the lack of fine fuel and poor continuity.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	897	1082	1267
Grass/Grasslike	168	196	224
Forb	56	67	78
Microbiotic Crusts	—	—	—
Tree	—	—	—
Total	1121	1345	1569

Figure 13. Plant community growth curve (percent production by month).
TX0767, Shrub Dominant with Midgrasses and Annuals Community. Shrubs
dominate the site with midgrasses and annuals..

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/Annuals Community (3.1). In extreme cases, shrubs will dominate with mainly annual forbs and grasses being present. Sand sagebrush and skunkbush canopy will continue to increase, on some sites yucca may increase and become a high percentage of the total plant community. Shrubs encompass approximately 70 percent annual production while forbs compose of 30 percent annual production. Numerous bare areas will be scattered throughout the site. The rolling mid-dunes areas may begin to show signs of wind erosion from the lack of deep rooted grass cover.

Community 3.1

Shrub/Annuals Community



Figure 14. 3.1 Shrub/Annuals Community

The Shrub Dominant/Annuals Community has (>70%) woody canopy of sand sagebrush and skunkbush, on some sites yucca can become a high percent of the total canopy. Annual forbs and grasses make up approximately (30%) or more of the total composition with numerous bare areas scattered throughout the site. This site will have some erosion taking place from winter and early spring winds in the bare places where annual vegetation prevails and numerous bare areas are scattered throughout the site. Productivity is low and so is diversity. In this state the site does not have a great deal of potential for livestock grazing and provides little wildlife benefits other than cover. A definite threshold has been crossed and the shrubs will remain dominant unless high energy inputs are applied, generally in the form of careful brush and pest management to reduce their dominance and provide a release of grasses and forbs. Reseeding on this site is difficult and not usually successful. Two growing seasons offering complete rest would improve the amount of vegetative cover and would probably be a good first step. After rest is applied, then chemical brush management should be applied to reduce sand sagebrush, skunkbush and possibly yucca. Pest management to control annual weed competition should also be applied.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	953	1205	1345
Forb	34	50	67
Grass/Grasslike	22	34	45
Microbiotic Crusts	—	—	—
Tree	—	—	—
Total	1009	1289	1457

Figure 16. Plant community growth curve (percent production by month). TX0768, Shrub Dominant/Annuals Community (hills). Shrubs and Annuals dominate the site..

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 pressure, no fires, and no brush management practices conducted on this plant community, the Tallgrass/Shrub State will transition to the Shrub/Midgrass State.

Restoration pathway R2A

State 2 to 1

With the implementation of conservation practices such as Prescribed Grazing and Brush Management, the Shrub/Midgrass/Annuals Community may be able to shift back to the reference plant community or the Tallgrass/Shrub Community. Caution must be exercised in applying Brush Management as brush may need reduction but not eradication due to susceptibility to erosion and woody plants help in the stabilization of the Sand Hills site.

Conservation practices

Brush Management
Prescribed Grazing

Transition T2A

State 2 to 3

With heavy continuous grazing, no fire, no brush management, and no pest management practices utilized, the Shrub/Midgrass/Annuals Community will transition into the Shrub/Annuals Community.

Restoration pathway R3B

State 3 to 1

Implementation of various conservation practices such as Prescribed Grazing, Brush Management, and Pest Management are required in order to shift from the Shrub/Annuals Community to the Tallgrass/Shrub Community. Approximately four to five years are needed to complete the transition.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

Restoration pathway R3A

State 3 to 2

Implementation of various conservation practices such as Prescribed Grazing, Brush Management, and Pest Management are required in order to shift from the Shrub/Annuals Community to the Shrub/Midgrass/Annuals Community. Approximately one to three years are needed to complete the transition.

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			448–897	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	280–560	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	112–224	–
	giant sandreed	CAGI3	<i>Calamovilfa gigantea</i>	56–112	–
2	Midgrasses			56–157	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	56–157	–
	sand lovegrass	ERTR3	<i>Eragrostis trichodes</i>	56–157	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	56–157	–
3	Shortgrasses			56–157	
	Wright's threeawn	ARPUW	<i>Aristida purpurea</i> var. <i>wrightii</i>	56–157	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	56–157	–
	coastal sandbur	CESP4	<i>Cenchrus spinifex</i>	56–157	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	56–157	–
	gummy lovegrass	ERCU	<i>Eragrostis curtipeidicellata</i>	56–157	–
	red lovegrass	ERSE	<i>Eragrostis secundiflora</i>	56–157	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	56–157	–
	fringed signalgrass	URCI	<i>Urochloa ciliatissima</i>	56–157	–

4	Cool-season grasses			22–78	
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	22–78	–
	needle and thread	HECOC8	<i>Hesperostipa comata</i> ssp. <i>comata</i>	22–78	–
5	Tallgrasses			0–34	
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–34	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	0–34	–
6	Midgrasses			56–157	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	56–157	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	56–157	–
Forb					
7	Forbs			67–101	
	Forb, annual	2FA	<i>Forb, annual</i>	67–101	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	67–101	–
	golden prairie clover	DAAU	<i>Dalea aurea</i>	67–101	–
	purple prairie clover	DAPUP	<i>Dalea purpurea</i> var. <i>purpurea</i>	67–101	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	67–101	–
	kisses	GASU2	<i>Gaura suffulta</i>	67–101	–
	bluebowls	GIRI3	<i>Giliastrum rigidulum</i>	67–101	–
	camphorweed	HESU3	<i>Heterotheca subaxillaris</i>	67–101	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	67–101	–
	grassland blazingstar	MEST3	<i>Mentzelia strictissima</i>	67–101	–
	littleleaf sensitive-briar	MIMI22	<i>Mimosa microphylla</i>	67–101	–
	evening primrose	OENOT	<i>Oenothera</i>	67–101	–
	gilia beardtongue	PEAM	<i>Penstemon ambiguus</i>	67–101	–
	queen's-delight	STSY	<i>Stillingia sylvatica</i>	67–101	–
Shrub/Vine					
8	Shrubs			168–224	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	168–224	–
	fragrant sumac	RHAR4	<i>Rhus aromatica</i>	168–224	–
9	Shrubs			56–78	
	southwestern rabbitbrush	CHPU4	<i>Chrysothamnus pulchellus</i>	56–78	–
	Oklahoma plum	PRGR	<i>Prunus gracilis</i>	56–78	–
	yucca	YUCCA	<i>Yucca</i>	56–78	–

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, and pronghorn antelope. The combination of grasses, forbs and woody shrubs that occur in the plant community provide suitable habitat for all the above species, at least at some time during the year. Water in the form of surface ponds or springs is not usually present nor is there any flowing streams found within the site itself. 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, Birdwatching, 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
Texas Tech University – Range, Wildlife & Fisheries Dept.

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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.

Reviewers:

Clint Rollins, RMS, NRCS, Amarillo, Texas
Mark Moseley, RMS, NRCS, San Antonio, Texas
Kelly Attebury, Soil Scientist, NRCS, Lubbock, Texas
Justin Clary, RMS, NRCS, Temple, Texas

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):** 35-40%.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight to moderate.
-
7. **Amount of litter movement (describe size and distance expected to travel):** Slight to moderate.
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** 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 grained structure 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 small interspaces should make rainfall impact minimal. This site has rapid permeability, slow runoff and available water 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 > Shrubs/Vines >
- Other: Forbs > Cool-season grasses
- 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):** 1,300 to 1,800 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 be potentially invasive on this site.

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