

Ecological site R078BY085TX Sand Hills 19-26" 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.

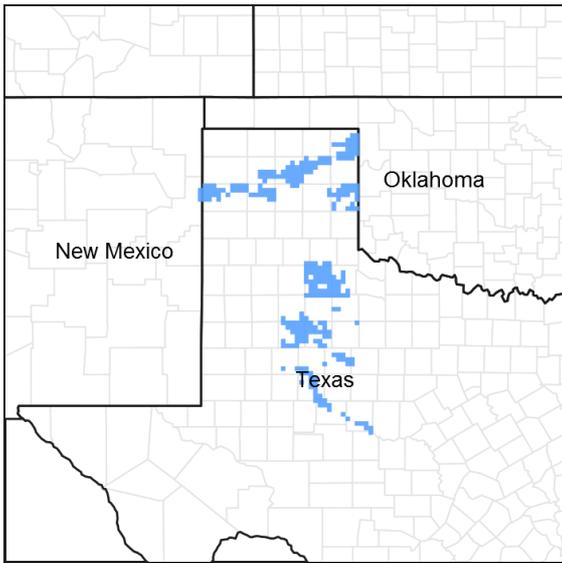


Figure 1. Mapped extent

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

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

LRU notes

NA

Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA Ag Handbook 296.

Ecological site concept

These sites occur on deep sandy soils on dunes. Reference vegetation consists of tallgrasses with shrubs, forbs, and midgrass species. Careful grazing management should be followed as these site are susceptible to wind

erosion. Without periodic fire, shrub canopy may increase on the site.

Associated sites

R078BY075TX	Gravelly 20-24" PZ Gravelly loam soils on uplands
R078BY086TX	Sandy 19-26" PZ Rolling sandy soils under shinnery oak
R078BY087TX	Sandy Bottomland 19-26" PZ Deep sandy soils on floodplains

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia filifolia</i>
Herbaceous	(1) <i>Andropogon hallii</i> (2) <i>Calamovilfa gigantea</i>

Physiographic features

This is an upland site with very sandy soils and undulating to rolling topography. The site often occurs adjacent to major rivers and streams but is higher in elevation. The soils that constitute the site are wind worked residual deposits. A small portion of the site may be active dunes and there may be some small blowout areas within the site.

Table 2. Representative physiographic features

Landforms	(1) Sandhills > Dune (2) Sandhills > Ridge (3) Sandhills > Hill
Runoff class	Negligible to very low
Flooding frequency	None
Ponding frequency	None
Elevation	700–2,850 ft
Slope	2–30%
Water table depth	60–80 in
Aspect	Aspect is not a significant factor

Climatic features

The climate of the western rolling plains is dry, sub-humid with hot summers and mild winters. Temperatures often reach 100 degrees F for several consecutive days during summer. Cold spells with temperatures less than 20 degrees F only last short periods of time. The soil is not frozen below the 3-inch depth for more than 2 to 3 days. Humidity is low during the winter and early spring months. Sometimes relative humidity is high enough to make summer days seem uncomfortable. Most of the precipitation comes in the form of rain and that in the spring and early summer principally. May is the wettest month followed by June. July and August are dryer and much hotter. Rainfall often comes as intense showers of relatively short duration. Rainfall rate per hour is often high and runoff is significant. Infiltration is diminished due to lack of opportunity time. The growing season begins in April and ends with the first killing frost in November. There is little snowfall with the average being about 10 inches. Rainfall averages about 22 inches.

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

Table 3. Representative climatic features

Frost-free period (characteristic range)	189-194 days
Freeze-free period (characteristic range)	204-222 days
Precipitation total (characteristic range)	23-24 in
Frost-free period (actual range)	184-201 days
Freeze-free period (actual range)	202-223 days
Precipitation total (actual range)	22-25 in
Frost-free period (average)	192 days
Freeze-free period (average)	213 days
Precipitation total (average)	23 in

Climate stations used

- (1) WELLINGTON [USC00419565], Wellington, TX
- (2) PADUCAH [USC00416740], Paducah, TX
- (3) JAYTON [USC00414570], Jayton, TX
- (4) SNYDER [USC00418433], Snyder, TX
- (5) ROBERT LEE [USC00417669], Robert Lee, TX

Influencing water features

Infiltration is very rapid. Runoff is almost none. Maximum amounts of available water capacity for plants. Some recharge to underground aquifers is probable.

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

Wetland description

NA

Soil features

The Sand Hills ecological site has undulating to rolling deep fine sands with high infiltration rates and low water storage capacity. The soil is fine grained structure and has no well defined horizons. Fertility is low but available water capacity for plants is high. If unprotected, soil surface temperatures in summer can reach over 120 degrees. Plant establishment is difficult. Wind erosion is an ever present problem unless good cover has stabilized the soil surface.

Major Soil Taxonomic Units correlated to this site include: Tivoli fine sand (some surveys have a Tivoli-Nobscott assoc.)

Table 4. Representative soil features

Parent material	(1) Eolian sands--sandstone
Surface texture	(1) Sand (2) Fine sand
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Rapid
Soil depth	72-80 in

Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	0.8–3.1 in
Calcium carbonate equivalent (0-40in)	0–2%
Electrical conductivity (0-40in)	0–1 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	6.1–7.8
Subsurface fragment volume <=3" (Depth not specified)	0–1%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This site developed in wind worked alluvial or eolian deposits. The soils are fine sands with no organic matter and no clay particles so the development of horizons is limited. The reworking by winds has contributed to the sites undulating topography. These are young soils developmentally and age of sediments does affect the nature of plant communities to some degree. Some of these soils may have been unstable just a short time ago. There are instances of good plant cover existing now where 75 years ago there were naked dunes. Sandhills that have been stable for a longer period of time usually have the more diverse plant communities present.

The fragility of the site cannot be overstated. It is essential that good plant cover be maintained or the site will actively erode. The most stable site ecologically and the more diverse plant community is one of tall grasses, perennial forbs and shrubs. Shrubs are often the most stable and adapted plants especially in times of drought. When explorers and military expeditions crossed the plains in the early 1800's, they noted the presence of sandhills with woody shrub vegetation. It is likely that with the help of natural fire from time to time, that a balance between shrubs and grasses was maintained. Fire would suppress the shrubs and for a time grasses would dominate until the shrubs became more competitive. This may have operated as a sort of cycle with an ebb and flow effect as to whether grasses or shrubs were dominant. Heavy grazing by livestock will reduce the tallgrasses and favor the shrubs. The tallgrass species are more susceptible to being damaged by grazing. Shrubs are resistant to grazing pressure and are generally not very palatable. Whatever the species growing on this site, it is almost certain that the best adapted will have deep, extensive root systems that can reach deep moisture far down in the soil profile. The ratio of grasses to shrubs in reference condition would vary from site to site but a good estimate of the range would be from (60% grass – 30% shrubs – 10% forbs) to a (45% grass – 45% shrub – 10% forb) composition. There are portions within the site where grasses dominate and places where woody plants dominate and they may not always be uniformly distributed. Grasses are not as drought tolerant as shrubs and cannot fully stabilize the site without some shrub cover. Of course, shrubs will increase when vigorous tallgrasses are removed from the community. A shrub dominated community may be very stable but diversity is limited and as wildlife habitat it is definitely less desirable.

As to the use of prescribed fire as a tool to restore balance within this community, extreme care should be taken. Sparsely covered dune areas should not be burned. The most advisable type of burn would be a late spring timed burn so the restoration of plant cover would be as quick as possible. Before entertaining the idea of burning at all, it is essential that the site be managed to achieve a high ecological condition so that recovery post burn can be as quick as possible. The possibility of significant wind erosion occurring is always a possibility.

Proper stocking and flexibility are essential. Judiciously applied brush management using labeled herbicides can be an aid in manipulating the balance between shrubs and grasses. Suppression rather than elimination of the woody plants should be the goal.

The major grass species occurring in the reference community are: sand bluestem (*Andropogon hallii*), little bluestem (*Schizachyrium scoparium*), giant sandreed (*Calamovilfa gigantea*), spike and giant dropseed (*Sporobolus contractus* and *Sporobolus giganteus*), with smaller amounts of switchgrass (*Panicum virgatum*) and Indiangrass (*Sorghastrum nutans*). Canada wildrye (*Elymus canadensis*) and needle and thread (*Hesperostipa comata*) are cool-season grasses that are more visible in years of above average winter and early spring moisture. There are several midgrasses present such as sideoats grama (*Bouteloua curtipendula*), sand lovegrass (*Eragrostis trichodes*), and sand paspalum (*Paspalum distichum*). Perennial forbs that are most prevalent are: western ragweed (*Ambrosia psilostachya*), catclaw sensitivebriar (*Mimosa microphylla*), bush morninglory (*Ipomea leptophylla*), pastel tephrosia (*Tephrosia virginiana*), Queen's delight (*Stylingia sylvatica*), erect dayflower (*Commelina erecta*), and prairie spiderwort (*Tradescantia occidentalis*). Several annual forbs are also present with more occurring in growing seasons of abundant rainfall. Major woody shrubs are: sand sagebrush (*Artemisia filifolia*), skunkbush sumac (*Rhus aromatica*), sand plum (*Prunus gracilis*), Havard shinoak (*Quercus havardii*) and southwestern rabbitbrush (*Chrysothamnus visidiflorus*). There are usually few scattered trees present throughout the site such as hackberry (*Celtis laegivata* var. *reticulata*) and western soapberry (*Sapindus saponaria*).

If the site has a good diversity of plant species, there will be a variety of wildlife species that utilize the site as habitat. White tail deer, turkey, and Bobwhite quail are the main game species that utilize the site as habitat. A variety of small mammals, birds and predators can be found as well.

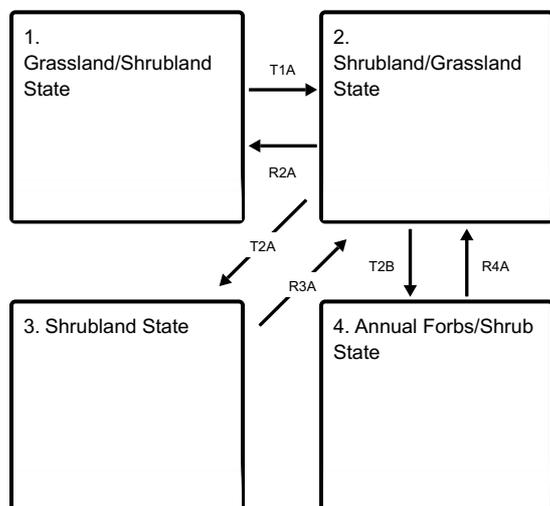
STATE AND TRANSITIONAL PATHWAYS (DIAGRAM):

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.

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

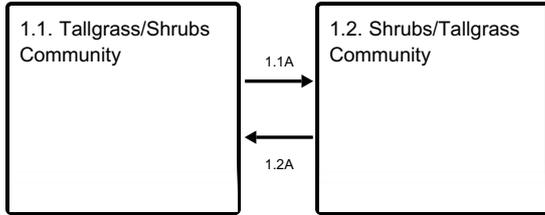
T2A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

T2B - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

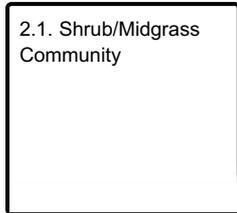
R3A - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

R4A - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

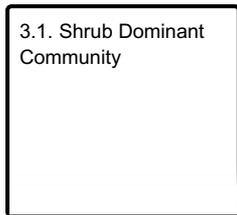
State 1 submodel, plant communities



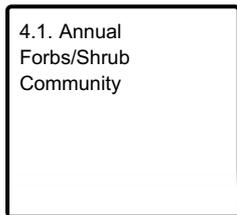
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1 Grassland/Shrubland State

Tallgrass/Shrubs community (1.1) is the reference plant community for the Sand Hills ecological site. Approximately 60% grass, 30% shrub, and 10% forbs makes up the annual production. Good production and diversity of tallgrasses, perennial forbs and woody shrubs for this site. The Shrub/Tallgrass Community (1.2) has experienced increasing shrub canopy and declining amounts of grasses. Species composition is approximately 45% tallgrasses, 45% shrubs, and 10% forbs. Annual production and diversity of tallgrasses, forbs and shrubs for this site is good.

Dominant plant species

- sand sagebrush (*Artemisia filifolia*), shrub
- sand bluestem (*Andropogon hallii*), grass
- giant sandreed (*Calamovilfa gigantea*), grass

Community 1.1 Tallgrass/Shrubs Community



Figure 8. 1.1 Tallgrass/Shrubs community

Tallgrass/Shrubs Community (1.1) is the reference plant community for the Sand Hills ecological site. Approximately 60% grass, 30% shrub, and 10% forbs makes up the annual production. Good production and diversity of tallgrasses, perennial forbs and woody shrubs for this site. This is a well balanced plant community with ecological processes functioning well. If this site continues to be heavily grazed and no brush management practices are conducted, this site will progress to the Shrubs/Tallgrass Community (1.2).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	750	1200	1400
Shrub/Vine	400	600	700
Forb	180	215	265
Tree	20	30	40
Microbiotic Crusts	5	20	30
Total	1355	2065	2435

Figure 10. Plant community growth curve (percent production by month). TX2034, Tallgrass climax community. Tall grasses with scattered shrubs and trees. Also some forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	4	8	20	28	15	8	8	5	2	0

Community 1.2 Shrubs/Tallgrass Community



Figure 11. 1.2 Shrubs/Tallgrass Community

The Shrub/Tallgrass Community (1.2) has experienced increasing shrub canopy and declining amounts of grasses. Species composition is approximately 45% tallgrasses, 45% shrubs, and 10% forbs. Annual production and diversity of tallgrasses, forbs and shrubs for this site is good. With prescribed grazing and brush management, this site can revert back to the Tallgrass/Shrubs Community (1.1). If heavy continuous grazing continues and no brush management practices are conducted, this site would progress to the Shrub/Midgrass Community (2.1).

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	750	1200	1400
Shrub/Vine	400	600	700
Forb	180	215	265
Tree	20	30	40
Microbiotic Crusts	2	20	30
Total	1352	2065	2435

Figure 13. Plant community growth curve (percent production by month). TX2034, Tallgrass climax community. Tall grasses with scattered shrubs and trees. Also some forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	4	8	20	28	15	8	8	5	2	0

**Pathway 1.1A
Community 1.1 to 1.2**



Tallgrass/Shrubs Community



Shrubs/Tallgrass Community

With heavy continuous grazing, no fires, and no brush management practices, the Tallgrass/Shrubs Community will shift to the Shrubs/Tallgrass Community.

**Pathway 1.2A
Community 1.2 to 1.1**



Shrubs/Tallgrass Community



Tallgrass/Shrubs Community

With the implementation of Prescribed Grazing and Brush Management conservation practices, the Shrub/Tallgrass Community can be shifted back to the Tallgrass/Shrubs Community.

Conservation practices

Brush Management
Prescribed Grazing

**State 2
Shrubland/Grassland State**

The Shrub/Midgrass Community is a shrub dominated community with increasing amounts of midgrasses and decreased presence of tallgrasses. The site is stable but diversity is limited. Dominant shrub species is sand shinnery oak and sand sagebrush. Midgrasses present include sideoats grama, sand lovegrass and sand paspalum. A limited forb population is expected for this plant community.

Community 2.1 Shrub/Midgrass Community



Figure 14. 2.1 Shrub/Midgrass Community

Shrub dominated community with increasing amounts of midgrasses and decreased presence of tallgrasses. The site is stable but diversity is limited. Dominant shrub species is sand shinnery oak and sand sagebrush. Midgrasses present include sideoats grama, sand lovegrass and sand paspalum. A limited forb population is expected for this plant community. With prescribed grazing, brush management, and prescribed burning practices applied, this community can revert to a Grassland/Shrubland state (1). With heavy continuous grazing and brush encroachment, this site can progress to the Shrubland State (3). Annual Forbs/Shrub State (4) can be approached from this community with heavy continuous grazing and no pest management.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	900	1300	1400
Grass/Grasslike	300	350	450
Forb	100	150	225
Tree	20	30	30
Microbiotic Crusts	0	5	5
Total	1320	1835	2110

Figure 16. Plant community growth curve (percent production by month).
TX2038, Shinoak Dominant with Sand Sage, Tallgrasses, Midgrasses.
Shinoak, Sand sage, Tallgrasses, and Midgrasses occupy this plant community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	3	6	15	25	20	10	5	10	4	1	1

State 3 Shrubland State

The Shrub Dominant Community is dominated by shrubs along with some annual and perennial forbs. There are a few perennial grasses are present in this community.

Community 3.1 Shrub Dominant Community



Figure 17. 3.1 Shrub Dominant Community

This community is dominated by shrubs along with some annual and perennial forbs. Few perennial grasses are present in this community. This community reverts back to the Shrub/Midgrass Community (2.1) through the use of prescribed grazing, brush management, and pest management.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	400	600	750
Grass/Grasslike	250	300	350
Forb	200	300	350
Tree	20	30	30
Microbiotic Crusts	5	10	10
Total	875	1240	1490

Figure 19. Plant community growth curve (percent production by month). TX2038, Shinoak Dominant with Sand Sage, Tallgrasses, Midgrasses. Shinoak, Sand sage, Tallgrasses, and Midgrasses occupy this plant community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	3	6	15	25	20	10	5	10	4	1	1

State 4 Annual Forbs/Shrub State

This Annual Forbs/Shrub plant community is dominated by annual forbs and scattered shrubs. It borders on being unstable because the annual plants will not prevail over time.

Community 4.1 Annual Forbs/Shrub Community



Figure 20. 4.1 Annual Forb/Shrub Community

This plant community is dominated by annual forbs and scattered shrubs. It borders on being unstable because the annual plants will not prevail over time. Wind erosion is highly possible during this stage. This community can be reverted back to the Shrub/Midgrass Community (2.1) with prescribed grazing, prescribed burning, and pest management of noxious species.

Table 9. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Forb	400	500	600
Shrub/Vine	300	400	450
Grass/Grasslike	250	300	350
Tree	20	30	30
Microbiotic Crusts	5	10	10
Total	975	1240	1440

Figure 22. Plant community growth curve (percent production by month). TX2039, Annual forb dominant with shrubs. Annual forbs dominate the site along with some shrub and decrease of grasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	3	6	10	30	25	5	5	10	4	1	1

Transition T1A

State 1 to 2

With Heavy Continuous Grazing, No Brush Management, and no fires, the Grassland/Shrubland State will transition into the Shrubland/Grassland State.

Restoration pathway R2A

State 2 to 1

With the implementation of various conservation practices including Prescribed Grazing, Brush Management, and Prescribed Burning, the Shrubland/Grassland State can be restored back into the Grassland/Shrubland State.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Transition T2A

State 2 to 3

With heavy continuous grazing, no brush management, no fires, and brush invasion, the Shrubland/Grassland State will transition into the Shrubland State.

Transition T2B

State 2 to 4

With heavy continuous grazing, no brush management, no pest management, and no fires, the Shrubland/Grassland State will transition into the Annual Forbs/Shrub State.

Restoration pathway R3A

State 3 to 2

With Prescribed Grazing, Brush Management, and Pest Management inputs, the Shrubland State can be restored back to the Shrubland/Grassland State.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

Restoration pathway R4A

State 4 to 2

With the application of various conservation practices including Prescribed Grazing, Prescribed Burning, and Pest Management, the Annual Forbs/Shrub State can be restored back to the Shrubland/Grassland State.

Conservation practices

Prescribed Burning
Prescribed Grazing
Integrated Pest Management (IPM)

Additional community tables

Table 10. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Tallgrasses			440–820	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	250–465	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	125–230	–
	giant sandreed	CAGI3	<i>Calamovilfa gigantea</i>	65–125	–
2	Tallgrasses			70–150	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	30–80	–
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	30–80	–
3	Tallgrasses			70–150	
	switchgrass	PAVI2	<i>Panicum virgatum</i>	30–80	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	30–80	–

4	Midgrasses			110–250	
	Wright's threeawn	ARPUW	<i>Aristida purpurea</i> var. <i>wrightii</i>	0–20	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–20	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–20	–
	signalgrass	BRACH	<i>Brachiaria</i>	0–20	–
	sandbur	CENCH	<i>Cenchrus</i>	0–20	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	0–20	–
	gummy lovegrass	ERCU	<i>Eragrostis curtipedunculata</i>	0–20	–
	red lovegrass	ERSE	<i>Eragrostis secundiflora</i>	0–20	–
	sand lovegrass	ERTR3	<i>Eragrostis trichodes</i>	0–20	–
	thin paspalum	PASE5	<i>Paspalum setaceum</i>	0–20	–
	blowout grass	REFL	<i>Redfieldia flexuosa</i>	0–20	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–20	–
5	Cool Season Grasses			80–160	
	sedge	CAREX	<i>Carex</i>	25–60	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	25–60	–
	Texas wintergrass	NALE3	<i>Nassella leucotricha</i>	25–60	–
Forb					
6	Forbs			180–265	
	Forb, annual	2FA	<i>Forb, annual</i>	0–15	–
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	0–15	–
	field sagewort	ARCAC	<i>Artemisia campestris</i> ssp. <i>caudata</i>	0–15	–
	partridge pea	CHFAF	<i>Chamaecrista fasciculata</i> var. <i>fasciculata</i>	0–15	–
	whitemouth dayflower	COERE	<i>Commelina erecta</i> var. <i>erecta</i>	0–15	–
	woolly prairie clover	DALA3	<i>Dalea lanata</i>	0–15	–
	annual buckwheat	ERAN4	<i>Eriogonum annuum</i>	0–15	–
	bluebowls	GIRI3	<i>Giliastrum rigidulum</i>	0–15	–
	camphorweed	HESU3	<i>Heterotheca subaxillaris</i>	0–15	–
	bush morning-glory	IPLA	<i>Ipomoea leptophylla</i>	0–15	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	0–15	–
	grassland blazingstar	MEST3	<i>Mentzelia strictissima</i>	0–15	–
	sensitive plant	MIMOS	<i>Mimosa</i>	0–15	–
	pony beebalm	MOPE	<i>Monarda pectinata</i>	0–15	–
	gilia beardtongue	PEAM	<i>Penstemon ambiguus</i>	0–15	–
	Riddell's ragwort	SERI2	<i>Senecio riddellii</i>	0–15	–
	queen's-delight	STSY	<i>Stillingia sylvatica</i>	0–15	–
	Virginia tephrosia	TEVI	<i>Tephrosia virginiana</i>	0–15	–
	prairie spiderwort	TROC	<i>Tradescantia occidentalis</i>	0–15	–
Shrub/Vine					
7	Shrubs/Vines			400–700	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	160–275	–
	Harbison oak	QUHA	<i>Quercus ×harbisonii</i>	160–275	–
	fragrant sumac	RHAR4	<i>Rhus aromatica</i>	40–100	–

	soapweed yucca	YUGL	<i>Yucca glauca</i>	10–20	–
	Oklahoma plum	PRGR	<i>Prunus gracilis</i>	10–20	–
	southwestern rabbitbrush	CHPU4	<i>Chrysothamnus pulchellus</i>	5–15	–
Tree					
8	Trees			20–40	
	hackberry	CELT1	<i>Celtis</i>	0–20	–
	wingleaf soapberry	SASA4	<i>Sapindus saponaria</i>	0–20	–

Animal community

Native animals that occupy this site include bob-white quail, white-tailed deer, turkey, lesser prairie chicken and various small mammals and grassland birds. The site provides cover and nesting habitat for turkeys, prairie chickens and quail. Deer frequent the site for screening cover and bedding sites. Many white-tailed deer fawns are observed in the tallgrass cover in the spring. Turkeys use this site frequently for nesting especially if it is in close proximity to creeks and/or bottomlands.

Hydrological functions

The Sand Hills ecological site serves as a possible recharge site for underground aquifers due to the extremely open soils which allow for deep percolation of water during times of heavy precipitation.

Recreational uses

Hunting, Camping, Hiking, Birdwatching, Photography, and Horseback Riding.

Wood products

None.

Other products

None.

Other information

None.

Inventory data references

Based on long-term observations of well-managed ranges, range inventory data, and numerous historical accounts of vegetation present at time of settlement.

Inventory Data References: Several years of clipping data and numerous old range inventories have been reviewed.

Other references

Soil Survey Reports for counties in MLRA 78B

NRCS Field Office Technical Guide Section IIE, Range Site Descriptions

The Soil Series Official Descriptions

Ecological Checklist of Vascular Plants of Texas (Texas A&M Exp. Station)

Gould's Grasses of Texas

The Texas Panhandle Frontier by Frederick W. Rathjen

Personal discussions with Dr. Ronald Sosebee, Texas Tech Dept. of Range, Wildlife and Fisheries, and with Dr.

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Bryan Christensen, 9/15/2023

Acknowledgments

Site Development and Testing Plan:

Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document.

Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	Stan Bradbury, Zone RMS, NRCS, Lubbock, Texas
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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 to 40% bare ground.

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 surface; 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, runoff is slow and available soil 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 > 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): Plant mortality and decadence is 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 shinoak can be 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.
