USDA Natural Resources
Conservation Service

Ecological site R077DY045TX
Sand Hills 12-17" PZ

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Accessed: 05/13/2025

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): 077D–Southern High Plains, Southwestern Part

This area is characterized by nearly level to gently undulating plains with scattered playa depressions. Soil temperature regime is thermic and soil moisture regime is aridic bordering on ustic. Sandy and loamy soils are generally well drained and range from shallow to deep and medium- to coarse-textured. Native vegetation is short- to midgrasses and sandy sites support tallgrasses with sand shin oak and mesquite. Current land use is mainly rangeland, although irrigated cropland is expanding.

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 windblown, deep, sandy soils on dunes. The reference vegetation consists if tallgrasses, midgrasses, forbs and shrubs. Due to the coarse soils, these sites can be quite productive in wet years. Conversely, the site may be very sensitive to dry periods. Careful grazing management is required to maintain the reference and prevent blowouts and wind erosion. With the removal of periodic fires, the site may exhibit an increase in woody

canopy cover.

Associated sites

R077DY046TX	**Sandy 12-17" PZ** Sandy sites are generally associated with Sand Hills sites MLRA 77D. The Sandy sites will occur downslope of Sand Hills as gently undulating soils that occur on broad upland plains. The associated Sandy sites occur as nearly level upland sites. Production is often higher on Sandy sites.
R077DY047TX	**Sandy Loam 12-17" PZ** Sandy Loam sites are generally associated with Sand Hills sites MLRA 77D. The Sandy Loam sites will occur downslope of Sand Hills as gently undulating soils that occur on broad upland plains. The associated Sandy sites occur as nearly level upland sites. Production is often higher on Sandy Loam sites.

Similar sites

R077DY046TX	**Sandy 12-17" PZ** Sandy sites are generally associated with Sand Hills sites MLRA 77D. The Sandy sites will occur downslope of Sand Hills as gently undulating soils that occur on broad upland plains. The associated Sandy sites occur as nearly level upland sites. Production is often higher on Sandy sites.
R077CY034TX	**Sand Hills 16-21" PZ** Sand hills sites (MLRA 77C) have similar forage plant communities with higher production potential due to higher mean annual precipitation (16 - 21 inches).

Table 1. Dominant plant species

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

Physiographic features

Soils correlated in the MLRA 77D Sand Hills ecological site are very deep soils formed in sandy eolian materials. The landform for Sand Hills is dunes and sandsheet. These soils are located on gently undulating to rolling uplands. Slopes range from 1 to 15 percent. Elevation ranges from 2500 to 4500 feet. They were formed in eolian sediments of the Blackwater Draw Formation of Pleistocene age. These soils are typically on dunes and sandsheets.

Table 2. Representative physiographic features

Landforms	(1) Plateau > Dune (2) Plateau > Interdune
Runoff class	Negligible to very low
Flooding frequency	None
Ponding frequency	None
Elevation	762–1,372 m
Slope	1–15%
Water table depth	203 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

Continental Steppe climate is prevalent in MLRA 77D. This climate type is typical of interiors of continents and is characterized by large variations in the magnitude of ranges in daily temperature extremes, low relative humidity, and irregularly spaced rainfall of moderate amounts. This climate regime is also known for being semi-arid with mild

winters.

Droughts occur with monotonous frequency although there will be years having excessive precipitation resulting in large accumulations of water that little benefit is obtained from the rainfall events. If good rains occur in the spring and summer months, annual production will be favorable even if the remainder of the year is not favorable. Most of the annual precipitation occurs as a result from spring and early summer thunderstorms. Due to the fact that the area is mainly flat, local flooding may occur but only of short duration. There is very little precipitation and infrequent snowfall amounts in the winter.

During the late winter and early spring months, dust storms occur very frequently. The flat plains of the area contribute very little resistance to the strong winds. Dust in many of these storms remains in the air for several days after the storms have passed.

Daytime temperatures are warm in the summer but there is a large diurnal range and most nights are comfortable. In summers, the normal daily maximum temperatures are in the low to mid 90s and the normal minimum temperatures are in the upper 60s and low 70s. Even though the temperatures may be high, the low humidity and high evaporation rates create a cooling effect during the nighttime hours. Fall months exhibit extremely variable weather. Winters are mild and are characterized by frequent cold fronts accompanied by strong, gusty, northerly winds. Most of the cold fronts are dry as they pass through the area.

Table 3. Representative climatic features

Frost-free period (characteristic range)	154-191 days
Freeze-free period (characteristic range)	181-194 days
Precipitation total (characteristic range)	381-432 mm
Frost-free period (actual range)	147-195 days
Freeze-free period (actual range)	171-213 days
Precipitation total (actual range)	381-432 mm
Frost-free period (average)	167 days
Freeze-free period (average)	190 days
Precipitation total (average)	406 mm

Climate stations used

- (1) MELROSE [USC00295617], Melrose, NM
- (2) ELIDA [USC00292854], Elida, NM
- (3) CROSSROADS 2 [USC00292207], Crossroads, NM
- (4) CAPROCK [USC00291445], Caprock, NM
- (5) TATUM [USC00298713], Tatum, NM
- (6) HOBBS 13W [USC00294030], Lovington, NM
- (7) ANDREWS [USC00410248], Andrews, TX
- (8) ODESSA SCHLEMEYER FLD [USW00003031], Odessa, TX
- (9) K-BAR RCH [USC00414710], Odessa, TX

Influencing water features

Water features are not an influencing factor in this site.

Wetland description

None.

Soil features

The soils of this site are very deep, excessively drained, rapidly permeable soils. Runoff is lowarent material is sandy eolian sediments.

Major Soil Taxonomic Units correlated to this site include: Penwell soils.

Table 4. Representative soil features

Parent material	(1) Eolian sands–igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sand (2) Loamy 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)	5.08–10.16 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–1 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.4
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 played a major role in the 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. For the purposes of a site description, it is assumed that the more diverse plant community is more indicative of the reference plant community that developed over time and was observed by European settlers.

This site is a tallgrass prairie dotted with sparse stands of shinoak and sand sagebrush. The duned areas produce a greater variety of tall bunchgrasses than the flatter areas of the site with a strong midgrass component scattered throughout the entire site. The Tallgrass/Midgrass/Shrubs Community (1.1) is a mixture of tallgrasses (50 percent), midgrasses (25 percent), shortgrasses (5 percent), shrubs (15 percent) and perennial forbs (5 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 dropseed (*Sporobolus giganteus*), Havard's panicgrass (*Panicum havardii*), little bluestem (Schizachrium scoparium) and traces of giant sandreed (*Calamovilfa gigantea*). Midgrass species include sand dropseed (*Sporobolus cryptandrus*), spike dropseed (sporobolus contractus), mesa dropseed (*Sporobolus flexuosus*), cane bluestem (*Bothriochloa barbinodis*) and trace amounts of sideoats grama (*Bouteloua*

curtipendula) and needle & thread (Heterostipa comata). The few shortgrass species found on this site include hooded windmillgrass (*Chloris cucullata*), tumble windmillgrass (*Chloris verticillata*), fall witchgrass (*Digitaria cognata*), sand paspalum (*Paspalum setaceum*) and Wright threeawn (*Aristida purpurea* var. wrightii). A good variety of forbs exist but the amount varies greatly from year to year. The more commonly found forbs are gaura species (Gaura spp.), primrose species (Oenothera spp.), sandhill penstemon (*Penstemon ambiguus*), annual wild buckwheat (*Eriogonum annuum*), halfshrub sundrop (*Calylophus serrulatus*), trailing ratany (*Krameria lanceolata*), dotted gayfeather (*Liatris punctata*), sand lily (*Mentzelia decapetala*), western ragweed (*Ambrosia psilostachya*), woollywhite (Hymnopappus filifolius), and common sagewort (*Artemisia campestris*). The major shrubs are sand shinoak (Quercus harvardii) accounting for approximately 10 percent of the site production with lesser amounts of sand sagebrush (*Artemisia filifolia*), southwestern rabbitbrush (*Chrysothamnus pulchellus*) and yucca (*Yucca glauca*). The woody shrubs are more stable from year to year and can better withstand the climatic extremes. 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 the 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.

Fire no doubt played 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 a sand hills site and dying out. There were undoubtedly times when the site did burn and present day observations bear this out and 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 quickly. 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.

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 Shortgrass/Shrub Community (1.2). Tallgrasses and midgrasses decline as shortgrass species and the shrub component increase. Heavy disturbance by hoof action to the soil surface can and usually do cause an increase in annual species. There will be a marked increase in western ragweed, perennial threeawn, and a wide variety of lower successional species. Bare areas will increase with wind erosion common throughout the site. The production of vegetation has shifted from mostly herbaceous vegetation to increasing amounts of woody shrubs. Herbaceous vegetation is still the largest production in this state.

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 the reference community. In this state, 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 heavy continuous grazing continues for extended periods, along with periodic droughts, retrogression will move towards a Shrub Community (2.1). In extreme cases, shrubs will dominate with annuals filling the bare interspaces. Sand shinoak will be the dominant shrub with sand sagebrush common throughout the site. Some sand hills sites may see a major increase in yucca plants. Many of the sand hills sites in this MLRA have seen an invasion of mesquite (*Prosopis glandulosa*) and broom snakeweed (*Gutierrezia sarothrae*) on the flatter slopes.

Invading grasses such as fringed signalgrass (*Urochloa ciliatissima*), red lovegrass (*Eragrostis secundiflora*), tumblegrass (*Schedonnardus paniculatus*), sand muhly (Muhlenbergia aronicola), and gummy lovegrass (*Eragrostis curtipedicellata*) appear on the site. Numerous bare areas will be scattered throughout the site. Under extreme conditions, this site deteriorates to active dunes and blowouts which are very difficult to re-vegetate.

The plant community will become so degraded that it cannot recover without extensive energy, economic and management inputs. At this point, a major threshold has been crossed. Restoration of the Shrub Community (2.1) requires prescribed grazing (3 - 5 consecutive years with deferment during the growing season), extensive brush and pest management and re-seeding with adapted native grass species. The success of re-seeding is totally dependent on timely and effective rainfall.

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 deer frequenting the site. A good 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.

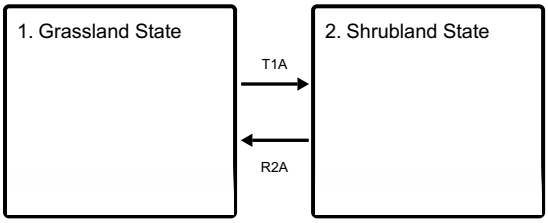
NOTE: Rangeland Health Reference Worksheets have been posted for this site on the Texas NRCS website (www.tx.nrcs.usda.gov) in Section II of the eFOTG under (F) Ecological Site Descriptions.

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.

State and transition model

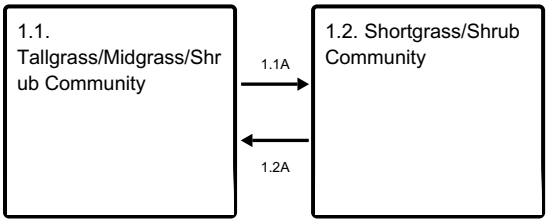
Ecosystem states



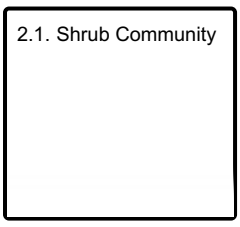
T1A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

R2A - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Grassland State

This site is a tallgrass prairie dotted with sparse stands of shinoak. The duned areas produce a greater variety of

tall bunchgrasses than the flatter areas of the site with a strong midgrass component scattered throughout the entire site. The Tallgrass/Midgrass/Shrubs Community (1.1) was a mixture of tallgrasses (50 percent), midgrasses (25 percent), shortgrasses (5 percent), shrubs (15 percent) and perennial forbs (5 percent). The amount of annual forbs found was dependent on the moisture situation in a given year. 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 Shortgrass/Shrub Community (1.2). Tallgrasses and midgrasses decline as shortgrass species and the shrub component increase. Heavy disturbance by hoof action to the soil surface can and usually do cause an increase in annual species. Bare areas will increase with wind erosion common throughout the site.

Dominant plant species

- sand bluestem (*Andropogon hallii*), grass
- giant dropseed (*Sporobolus giganteus*), grass

Community 1.1
Tallgrass/Midgrass/Shrub Community

Figure 8. 1.1 Tallgrass/Midgrass/Shrub Community

The Tallgrass/ Midgrass/Shrubs Community (1.1) is a tallgrasses dominant plant community (50 percent) with a strong midgrass component (25 percent), shortgrass species account for less than (5 percent) of the total site production. The duned areas produce a greater variety of tall bunchgrasses than the flatter areas of the site. Sand shinoak is the dominant shrub species (10 percent) with lesser amounts (5 percent) of sand sagebrush, rabbitbrush and yucca. A good variety of forbs exist but the amount varied greatly from year to year. Annual production is dependent on the moisture situation in a given year. Perennial forbs typically made up (5 percent) of the total site production. The percent bare ground on the dune areas ranges from 35–40 percent with minimal wind erosion occurring due to surrounding tall grass species and scattered shrubs. The plant community's ecological processes are in balance with the environment. Most energy and nutrient cycling is contained in the narrow grass/soil interface and evapo-transpiration was minimal. Maintenance of this community requires continued proper grazing management as well as occasional brush and pest management.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	897	1345	1793
Shrub/Vine	168	252	336
Forb	56	84	112
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1121**	**1681**	**2241**

Figure 10. Plant community growth curve (percent production by month).

TX1264, Tallgrass/Midgrass/Shrubs Community. Warm season native tallgrass/midgrass/shrub community..

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

Community 1.2
Shortgrass/Shrub Community

Figure 11. 1.2 Shortgrass/Shrub Community

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 Shortgrass/Shrub Community (1.2). Tallgrasses and midgrasses decline as shortgrass species and the shrub component increase. Heavy disturbance by hoof action to the soil surface can and usually do cause an increase in annual species. There will be a marked increase in western ragweed, perennial threeawn, and a wide variety of lower successional species. Bare areas will increase with wind erosion common throughout dune areas on the site. In this state, ecological processes have changed somewhat, but the pathway back toward the reference community(1.1) can be initiated through prescribed grazing and selective brush and pest 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. If appropriate conditions exist, careful use of herbicides can selectively suppress shrub growth without destabilizing the site. Care should be taken to avoid treating the tops of dunes and areas of poor vegetative cover.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	448	673	897
Shrub/Vine	336	504	673
Forb	90	123	157
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**874**	**1300**	**1727**

Figure 13. Plant community growth curve (percent production by month). TX1252, Shortgrass Dominant/Invading Shrub Community. Warm-season shortgrasses with increasing shrubs and forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	5	12	16	15	20	18	9	1	0

Pathway 1.1A

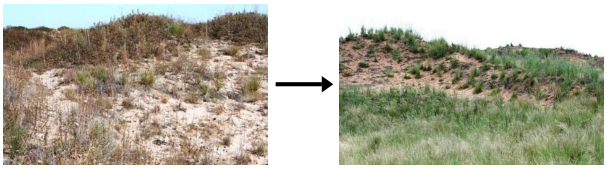
Community 1.1 to 1.2

Tallgrass/Midgrass/Shrub Community

Shortgrass/Shrub Community

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 Shortgrass/Shrub Community (1.2). Tallgrasses and midgrasses decline as shortgrass species and the shrub component increase. Heavy disturbance by hoof action to the soil surface can and usually do cause an increase in annual species.

Pathway 1.2A
Community 1.2 to 1.1



Shortgrass/Shrub Community

Tallgrass/Midgrass/Shrub Community

The pathway back toward plant community (1.1) from the Shortgrass/Shrub Community (1.2) can be initiated through prescribed grazing and selective brush and pest 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. If appropriate conditions exist, careful use of herbicides can selectively suppress shrub growth without destabilizing the site. Care should be taken to avoid treating the tops of dunes and areas of poor vegetative cover.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing
Stream Crossing

State 2
Shrubland State

Sand shinoak will be the dominant shrub with sand sagebrush common throughout the site. Some sand hills sites may see a major increase in yucca plants. Many of the sand hills sites in this MLRA have seen an invasion of mesquite and broom snakeweed on the flatter slopes. Un-palatable shortgrass species will appear on the site. Numerous bare areas will be scattered throughout the site. Under extreme conditions, this site deteriorates to active dunes and blowouts which are very difficult to re-vegetate.

Dominant plant species

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

Community 2.1
Shrub Community

Figure 14. 2.1 Shrub Community

If heavy continuous grazing continues for extended periods, along with periodic droughts, retrogression will move towards a Shrub Community (2.1). In extreme cases, shrubs will dominate with annuals filling the bare interspaces. Sand shinoak will be the dominant shrub with sand sagebrush common throughout the site. Some sand hills sites may see a major increase in yucca plants. Many of the sand hills sites in this MLRA have seen an invasion of mesquite and broom snakeweed on the flatter slopes. Un-palatable shortgrass species will appear on the site. Numerous bare areas will be scattered throughout the site. Under extreme conditions, this site deteriorates to active dunes and blowouts which are very difficult to re-vegetate. The plant community will become so degraded that it cannot recover without extensive energy, economic and management inputs. At this point, a major threshold has been crossed. Restoration of the Shrub Community (2.1) requires prescribed grazing (3 - 5 consecutive years with deferment during the growing season), extensive brush and pest management and re-seeding with adapted native grass species. The success of re-seeding is totally dependent on timely and effective rainfall.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	897	1121	1345
Grass/Grasslike	112	168	224
Forb	112	168	224
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1121**	**1457**	**1793**

Figure 16. Plant community growth curve (percent production by month). TX1254, Shrub/Shortgrass/Annuals Community. Spring and fall growth of shortgrasses, annuals, and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	4	6	10	16	15	20	15	12	1	0

Transition T1A
State 1 to 2

If heavy continuous grazing continues for extended periods, along with periodic droughts, retrogression will move towards a Shrub Community (2.1). In extreme cases, shrubs will dominate with annuals filling the bare interspaces.

Restoration pathway R2A
State 2 to 1

Restoration of the Shrubland State (2.0) to the Grassland State (1.0) requires prescribed grazing (3 - 5 consecutive years with deferment during the growing season), extensive brush and pest management and re-seeding with

adapted native grass species. The success of re-seeding is totally dependent on timely and effective rainfall.

Conservation practices

Brush Management
Prescribed Grazing
Range Planting
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**			560–1121	
	sand bluestem	ANHA	*Andropogon hallii*	224–448	–
	Havard's panicgrass	PAHA2	*Panicum havardii*	112–224	–
	little bluestem	SCSC	*Schizachyrium scoparium*	112–224	–
	giant dropseed	SPGI	*Sporobolus giganteus*	112–224	–
	giant sandreed	CAGI3	*Calamovilfa gigantea*	0–1	–
2	**Midgrasses**			280–560	
	spike dropseed	SPCO4	*Sporobolus contractus*	112–224	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	56–112	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	56–112	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	56–112	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0–1	–
3	**Shortgrasses**			56–112	
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	22–45	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	11–22	–
	fall witchgrass	DICO6	*Digitaria cognata*	11–22	–
	thin paspalum	PASE5	*Paspalum setaceum*	11–22	–
4	**Cool-season grasses**			0–1	
	needle and thread	HECO26	*Hesperostipa comata*	0–1	–
Forb					
5	**Forbs**			56–112	
	annual buckwheat	ERAN4	*Eriogonum annuum*	11–22	–
	beeblossom	GAURA	*Gaura*	4–9	–
	fineleaf hymenopappus	HYFI	*Hymenopappus filifolius*	4–9	–
	trailing krameria	KRLA	*Krameria lanceolata*	4–9	–
	dotted blazing star	LIPU	*Liatris punctata*	4–9	–
	tenpetal blazingstar	MEDE2	*Mentzelia decapetala*	4–9	–
	evening primrose	OENOT	*Oenothera*	4–9	–
	gilia beardtongue	PEAM	*Penstemon ambiguus*	4–9	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	4–9	–
	field sagewort	ARCA12	*Artemisia campestris*	4–9	–
	yellow sundrops	CASE12	*Calylophus serrulatus*	4–9	–
Shrub/Vine					
6	**Shrubs**			168–336	
	Havard oak	QUHA3	*Quercus havardii*	112–224	–
	sand sagebrush	ARFI2	*Artemisia filifolia*	34–67	–
	southwestern rabbitbrush	CHPU4	*Chrysothamnus pulchellus*	11–22	–
	soapweed yucca	YUGL	*Yucca glauca*	11–22	–

Animal community

This site is inhabited by deer, antelope, dove and quail. The open, treeless landscape makes this site especially

desirable for antelope. The tall grasses provide food and cover for quail and dove.

The woody component of the dune areas attracts deer for browse and cover.

Hydrological functions

The soils of this site take in water at a very rapid rate and capable of absorbing almost all the rainfall that occurs. The lack of soil structure allows water and air to move freely throughout the soil profile. Surface runoff and water erosion are negligible.

Recreational uses

These sites are inaccessible except for 4-wheel drive vehicles, foot or horseback. They usually occur in large tracts of rangeland. This site is extremely fragile and all types of vehicle traffic is discouraged. Uses can include hunting, camping, hiking, bird watching, photography, and 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)
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Kingsbury, John M. (1964) Poisonous Plants of the United States and Canada.
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Sosebee, Ronald E. Timing – The Key to Herbicidal Control of Broom Snakeweed. Department of Natural Resources Management, Texas Tech University, Lubbock, Texas.

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Approval

Bryan Christensen, 9/11/2023

Acknowledgments

Site Development and Testing Plan

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

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

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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, Lubbock, Texas
Contact for lead author	806-791-0581
Date	02/01/2010
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.

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

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

bare ground): 35-40% bare ground.

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

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6. **Extent of wind scoured, blowouts and/or depositional areas:** Moderate.

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7. **Amount of litter movement (describe size and distance expected to travel):** Slight to moderate.

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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.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Fine sanc single grained surface with very low SOM.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Basal cover and density with moderate interspaces should make rainfall impact minimal. This site has rapid permeability, runoff is slow and available water holding capacity is low.

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

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

    Dominant: Warm-season tallgrasses >

    Sub-dominant: Warm-season shortgrasses > Shrubs/Vines >

    Other: Forbs > Cool-season grasses

    Additional:

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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.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-**

production): 1,000 to 2,000 pounds per acre.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Sand sagebrush and sand shinoak can become invasive.

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