USDA Natural Resources Conservation Service

Ecological site R077BY021TX
Sandy Loam 12-17" PZ

Last updated: 9/11/2023
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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 077B–Southern High Plains, Northwestern Part

MLRA 77B 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 loam soils on uplands. The reference vegetation consists of midgrasses and tallgrasses mixed with forbs and very few shrubs. Abusive grazing practices can lead to a shift in the plant community. Without fire or other brush management, woody species may increase across the site.

Associated sites

R077BY725TX	**Draw 12-17" PZ** Adjacent and downslope of the Sandy Loam site in certain areas. The soils are sandy in texture. Midgrasses dominate but a good mixture of tallgrasses are found on this site. More productive than the Sandy Loam site.
R077BY722TX	**High Lime 12-17" PZ** Adjacent and often on the same landscape, downslope or upslope from the Sandy Loam site. The soils are sandy loam to clay loam in surface texture. Midgrasses dominate some shortgrasses are found on this site. Less productive than the Sandy Loam site.
R077BY026NM	**Gravelly Loam** Sometimes adjacent and upslope of the Sandy Loam site. The site has deep gravelly loam soils. Slopes are steeper (0 to 9%). Midgrasses dominate but a good mixture of shortgrasses occur on this site. Production is higher.
R077BY020TX	**Sand Hills 12-17" PZ** Generally adjacent and upslope of the Sandy Loam site. The soils are sandy in texture. Tallgrasses dominate, some midgrasses can be found on this site. Less productive than the Sandy Loam site.
R077BY658TX	**Sandy 12-17" PZ** Generally adjacent and on similar locations of the Sandy Loam site. The soils are loamy sand in texture. Tallgrasses dominate, but has a good mixture of midgrasses. Less productive than the Sandy Loam site.

Similar sites

R077AY012TX	**Sandy Loam 16-22" PZ** This site has deep to very deep sandy loam soils like the Sandy Loam site in MLRA 77B. Mean annual precipitation is higher (16 to 22 inches). Midgrasses dominate, some shortgrasses can be found on this site. More productive than the Sandy Loam site in MLRA 77B.
R077BY020TX	**Sand Hills 12-17" PZ** Generally adjacent and upslope of the Sandy Loam site. The soils are sandy in texture. Tallgrasses dominate, some midgrasses can be found on this site. Less productive than the Sandy Loam site.
R077BY658TX	**Sandy 12-17" PZ** Generally adjacent and on similar locations of the Sandy Loam site. The soils are loamy sand in texture. Midgrasses dominate, but has a good mixture of tallgrasses. Less productive than the Sandy Loam site.
R077EY066TX	**Sandy Loam 16-24" PZ** This site has deep to very deep sandy loam soils lie the Sandy Loam site in MLRA 77B. Mean annual temperature is higher (59 to 63 degrees F). Mean annual precipitation is higher (16 to 24 inches). Midgrasses dominate, some shortgrasses can be found on this site. More productive than the Sandy Loam site in MLRA 77B.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia filifolia* (2) *Mimosa aculeaticarpa*
Herbaceous	(1) *Bouteloua curtipendula* (2) *Schizachyrium scoparium*

Physiographic features

The Sandy Loam site occurs on nearly level to gently sloping plains. Due to the general nature of this site, runoff can be both generated and received. This generally depends on the amount of vegetative cover and intensity of the precipitation event.

Table 2. Representative physiographic features

Landforms	(1) Plateau > Plain

Runoff class	Negligible to low
Flooding frequency	None
Ponding frequency	None
Elevation	792–1,798 m
Slope	0–5%
Water table depth	203 cm
Aspect	W, NW, N, NE, E, SE, S, SW

Climatic features

The climate is semiarid continental. Summers are hot with winters generally being mild. Temperature extremes are common. Humidity is generally low, and short-term droughts are common. Wind speeds average 12 mph and are highest during early spring. The prevailing wind direction is southwest. In the fall and winter, northers are common with severe temperature drops. Cold spells do not generally last more than a few days. Evaporation in summer is high. Open pan evaporation exceeds 6 ft. per year. Most of the precipitation occurs from May to September. Rainfall events often occur as intense showers of relatively short duration. Frequently during the first 15 minutes of a thunderstorm, the rate of rainfall may be 6 to 8 inches per hour. Snowfall average is about 15 inches, but it is not unusual for snowfall to exceed 30 inches every few years. Long term droughts are likely to occur every 15 to 20 years and may last 4 to 5 years. Mean precipitation is around 17 inches but varies significantly from year to year. Rainfall amounts over the last 100 years have varied from as little as 9 inches to as much as 37 inches. The probability is about 70 percent that precipitation will fall between 14 inches and 23 inches. Growing season averages 195 days. Average first frost is around October 22, and the last freeze of the season should occur around April 1.

Table 3. Representative climatic features

Frost-free period (characteristic range)	140-145 days
Freeze-free period (characteristic range)	169-170 days
Precipitation total (characteristic range)	432-457 mm
Frost-free period (actual range)	139-147 days
Freeze-free period (actual range)	168-170 days
Precipitation total (actual range)	406-457 mm
Frost-free period (average)	143 days
Freeze-free period (average)	169 days
Precipitation total (average)	432 mm

Climate stations used

- (1) CLAYTON 1 N [USC00291883], 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

Sandy loam soils allow for moderate infiltration. Runoff is slow to moderate. With poor cover, minor gullies may form from water concentration. Plant available water in the soil is moderate.

Wetland description

None.

Soil features

These are very deep sandy soils that are part of the Blackwater Draw geologic formation. Slopes dominantly range from 1 to 3 percent. They are low in fertility, have a low water storage capacity, have a high infiltration rate, and exhibit very little runoff. They yield water to plants easily and are subject to wind erosion without good cover. If cover is poor and runoff is excessive, significant water erosion can also occur. Plant roots easily penetrate the soil.

Major Soil Taxonomic Units correlated to this site include: Dallam fine sandy loam, Perico fine sandy loam and Rickmore fine sandy loam.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sandy loam
Family particle size	(1) Fine-loamy
Drainage class	Well drained
Permeability class	Moderate to moderately 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)	0–40%
Electrical conductivity (0-101.6cm)	0–3 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (0-101.6cm)	0–5%
Subsurface fragment volume >3" (0-101.6cm)	0%

Ecological dynamics

The soils, topographic location, climate, periodic droughts and fire influenced the stabilization of the reference plant community on this site as was the case on most all High Plains ecological sites. Grazing and/or browsing by local and nomadic wildlife influenced the plant community as well. The resulting plant community was a Midgrass/Tallgrass Dominant Community (1.1). Midgrasses tend to dominate over most of the site with sideoats grama (*Bouteloua curtipendula*) being the overall dominant species, lesser amounts of vine mesquite (*Panicum obtusum*), Arizona cottontop (*Digitaria californica*), plains bristlegrass (*Setaria leucopila*), hooded windmillgrass (*Chloris cucullata*), sand dropseed (*Sporobolus cryptandrus*), tumble windmillgrass (*Chloris verticillata*), silver bluestem (*Bothriochloa laguroides*), hairy grama (*Bouteloua hirsuta*), fall witchgrass (*Digitaria cognata*), gummy lovegrass (*Eragrostis curtipedicellata*), black grama (*Bouteloua eriopoda*), and sand muhly (*Muhlenbergia arenicola*). The dominant tallgrass is little bluestem (*Schizachyrium scoparium*) with lesser amounts of Indiangrass (*Sorghastrum nutans*) and sand bluestem (*Andropogon hallii*). In areas where tighter soils occur, the shortgrasses include blue grama (*Bouteloua gracilis*) and buffalograss (*Bouteloua dactyloides*). Some cool-season grasses occur in small amounts such as western wheatgrass (*Pascopyrum smithii*), Canada wildrye (*Elymus canadensis*) and needle & thread (*Hesperostipa comata*). Typically associated forbs included dotted gayfeather (*Liatris punctata*),

prairie clover (*Dalea purpurea*), catclaw sensitivebriar (Schrankia uncinata), golden dalea (*Dalea aurea*), gaura (Gaura spp.), rushpea (Hoffmanseggia glauca), Engelmanndaisy (*Engelmannia peristenia*), lyreleaf greeneyes (*Berlandiera lyrata*), sagewort (*Artemisia ludoviciana*), scarlet globemallow (*Sphaeralcea coccinea*), Fendler's penstemon (*Penstemon fendleri*), wild alfalfa (*Psoralidium tenuiflorum*) and numerous annual forbs. Woody species include sand sagebrush (Artemesia filifolia), yucca (*Yucca glauca*), and catclaw mimosa (Mimosa biuncifera). Nutrient cycling, the water cycle, watershed protection and biological functions are functioning at their peak.

Natural fire likely played an important role in the function of most plains sites, especially the tall grass communities. Tall grasses such as sand bluestem and little bluestem were dependent upon fire to stimulate them and remove old growth that would accumulate on the soil surface. Fire also kept shrubs from getting too thick. Fire helped to keep a balance between the grasses, forbs and shrubs. Wildlife habitat was improved by opening up canopies and stimulating forb growth. The deep rooted species that grow on the site are not easily damaged by fire. Yucca and shrubs will usually re-sprout, but are suppressed for a time allowing grasses to dominate. If periodic fire does not occur, then the yucca and woody plants will slowly increase and with grazing pressure can begin to dominate the site. Since fire is not always available to be applied, then practices such as brush management may necessary from time to time to help keep the community in balance.

Periodic overgrazing and trampling by migrating herds of bison and resident herds of pronghorn antelope probably occurred during drought periods. However, long rest periods followed once the large herds of bison and antelope moved out of the area, allowing the resilient grassland to re-establish itself and maintain its reference community structure.

The major forces influencing the transition from the reference community is continued over-grazing by livestock and the decrease in the frequency and intensity of fire. As livestock and wildlife numbers increase and grazing use exceeds a plants ability to sustain defoliation, the more palatable and generally more productive species, decline in stature, productivity and density

Under good management this is one of the most productive sites in MLRA 77B and will give good animal performance. Little bluestem and sideoats grama are fairly resistant to grazing pressure but will decline if continuous heavy grazing persist. The tallgrasses are fairly sensitive to overgrazing and will begin to decrease more quickly if continuous heavy grazing occurs for long periods. If excessive grazing pressure continues, ecological retrogression occurs. The tendency of this site is to become a shortgrass dominant; sideoats grama and little bluestem will give way to blue grama. There will be an increase in perennial and annual forbs, with increasing amounts of yucca and sand sagebrush. The decrease in density and stature of the midgrasses and tallgrasses and an increase in shortgrasses and the density of the yucca and woody vegetation brings about a new plant community, the Shortgrass/Midgrass/Shrub Community (1.2).

In the Shortgrass/Midgrass/Shrub Community (1.2), the transition back to the reference plant community is possible with proper grazing management, brush and pest management. Prescribed burning could be used if the conditions allow. The production of vegetation has shifted from mostly herbaceous vegetation to more yucca and woody, although the herbaceous vegetation biomass is still the largest amount. Nutrient cycling, the water cycle, watershed protection and biological functions have changed little.

If long-term heavy grazing continues, a threshold will be crossed to a Shrub/Shortgrass Community (2.1). In this degraded state, typical vegetation will be low vigor blue grama and bare areas will open up with annuals filling the voids. Perennial threeawn will invade this site when the more desirable grasses are weakened and/or removed. Yucca and sand sagebrush will increase dramatically. Occasionally, broom snakeweed (*Gutierrezia sarothrae*) will increase to the point of domination. The loss of herbaceous cover and increased bare ground encourages accelerated erosion. Nutrient cycling, the water cycle, watershed protection and biological functions have been severely reduced. The plant community is so degraded that it cannot reverse the transition without extensive energy and management inputs. Restoration of phase (2.1) will require prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical and/or mechanical brush management and some form of pest management. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this phase.

Recovery can occur fairly rapid if the competitive plants are controlled and proper grazing management is applied. Full recovery and maintenance of the reference plant community requires continued proper grazing management

as well as occasional brush and pest management.

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

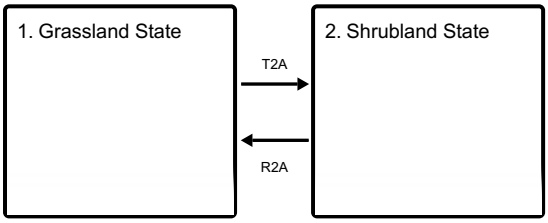
STATE AND TRANSITIONAL PATHWAYS DIAGRAM (Narrative):
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that 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.

STATE AND TRANSITIONAL PATHWAYS DIAGRAM:

State and transition model

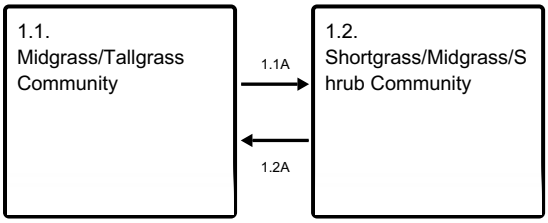
Ecosystem states



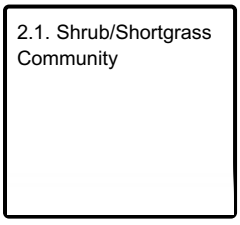
T2A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

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

Midgrasses tend to dominate over most of the site with sideoats grama being the overall dominant species, lesser amounts of other midgrasses such as vine mesquite, Arizona cottontop, and plains bristlegrass. The dominant tallgrass is little bluestem with lesser amounts of Indiangrass and sand bluestem. In areas where tighter soils occur, the shortgrasses include blue grama and buffalograss. Some cool-season grasses occur in small amounts. Typically associated forbs reach five percent species composition while woody species include sand sagebrush, yucca, and catclaw mimosa approach five percent as well. The decrease in density and stature of the midgrasses and tallgrasses and an increase in shortgrasses and the density of the yucca and woody vegetation brings about a new plant community, the Shortgrass/Midgrass/Shrub Community (1.2). Little bluestem and sideoats grama are fairly resistant to grazing pressure but will decline if continuous heavy grazing persist. The tallgrasses are fairly sensitive to overgrazing and will begin to decrease more quickly if continuous heavy grazing occurs for long periods. The tendency of this site is to become a shortgrass dominant; sideoats grama and little bluestem will give way to blue grama. There will be an increase in perennial and annual forbs, with increasing amounts of yucca and sand sagebrush.

Community 1.1
Midgrass/Tallgrass Community

Figure 8. 1.1 Midgrass/Tallgrass Community

The interpretive or "reference" plant community for this site is a good mixture of midgrasses, tallgrasses and lesser amounts of shortgrasses make up approximately (90%) of the plant community. Midgrasses tend to dominate over most of the site with sideoats grama being the overall dominant species. Little bluestem is the dominant tallgrass and blue grama is the dominant shortgrass. There are small amounts of tallgrasses such as sand bluestem and Indiangrass present. The cool-season grasses include western wheatgrass, Canada wildrye and needle & thread in lesser amounts. There is a good variety of perennial forbs (see Annual Production below) making up three to five percent of the community’s annual production with sand sagebrush and yucca making up another three to five percent of the overall plant community. Maintenance of this plant 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	1233	1457	1681
Forb	67	78	90
Shrub/Vine	67	78	90
Tree	–	–	–
Microbiotic Crusts	–	–	–
Total	**1367**	**1613**	**1861**

Figure 10. Plant community growth curve (percent production by month). TX0762, Midgrass/Tallgrass (favorable soil moisture). Warm season

midgrass dominant with lesser amounts of tallgrasses. Few shortgrasses, increased forbs and few woody plants. .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	8	10	15	20	15	10	10	5	5	0

Community 1.2
Shortgrass/Midgrass/Shrub Community

Figure 11. 1.2 Shortgrass/Midgrass/Shrub Community

As retrogression occurs, the tendency of this site is to become a shortgrass dominant community. This plant community has not crossed a threshold and can be managed back to near reference conditions. The sideoats grama and little bluestem will give way to blue grama. There will be an increase in variety of perennial and annual forbs, with increasing amounts of yucca and sand sagebrush. The production of vegetation has shifted from mostly herbaceous vegetation to more yucca and woody, although the herbaceous vegetation biomass is still the largest amount. Nutrient cycling, the water cycle, watershed protection and biological functions have changed little. The transition back to near reference conditions is possible with proper grazing management, brush and pest management.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	785	953	1121
Shrub/Vine	202	258	314
Forb	78	123	168
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1065**	**1334**	**1603**

Figure 13. Plant community growth curve (percent production by month). TX0761, Shortgrass/Midgrass with annual forbs/shrubs. Warm-season shortgrasses dominant with lesser amounts of mid and tallgrasses. There is an increase of annual forbs and woody shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	5	9	23	24	12	7	10	5	2	1

Pathway 1.1A
Community 1.1 to 1.2

Midgrass/Tallgrass Community

Shortgrass/Midgrass/Shrub Community

With heavy continuous grazing, no fire and no brush management practices, the Midgrass/Tallgrass Dominant Community is shifted to the Shortgrass/Midgrass/Shrub Community.

Pathway 1.2A
Community 1.2 to 1.1

Shortgrass/Midgrass/Shrub Community

Midgrass/Tallgrass Community

The Shortgrass/Midgrass/Shrub Community can be shifted back to the Midgrass/Tallgrass Community by installing various conservation practices such as Prescribed Grazing, Brush Management, and Prescribed Burning.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

State 2
Shrubland State

If long-term heavy grazing continues, a threshold will be crossed to a Shrub/Shortgrass Community (2.1). In this degraded state, typical vegetation will be low vigor blue grama and bare areas will open up with annuals filling the voids. Perennial threeawn will invade this site when the more desirable grasses are weakened and/or removed. Yucca and sand sagebrush will increase dramatically. Occasionally, broom snakeweed will increase to the point of domination. The loss of herbaceous cover and increased bare ground encourages accelerated erosion.

Community 2.1
Shrub/Shortgrass Community

Figure 14. 2.1 Shrub/Shortgrass Community

In this phase of retrogression a threshold has been crossed to a Shrub/Shortgrass Community (2.1). In this

degraded state, typical vegetation will be low vigor blue grama; bare areas will open up with annuals filling the voids. Few midgrasses, if any, remain. Perennial three-awn will invade this site when the more desirable grasses are weakened and/or removed. Yucca and sand sagebrush will increase dramatically. Occasionally broom snakeweed may increase on the site to the point of domination. The loss of herbaceous cover and increased bare ground encourages accelerated erosion. Nutrient cycling, the water cycle, watershed protection and biological functions have been severely reduced. The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. Restoration of phase (2.1) will require prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical and/or mechanical brush management and some form of pest management. With the reduced amounts of grass fuel, prescribed burning is usually not an option in this phase.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	280	420	560
Shrub/Vine	314	370	426
Forb	45	67	90
Microbiotic Crusts	–	1	1
Tree	–	–	–
Total	**639**	**858**	**1077**

Figure 16. Plant community growth curve (percent production by month). TX0755, Shrubs/Shortgrass Community. Shrub/Shortgrass community in low production with broom snakeweed dominating the site over shortgrasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	8	16	25	5	5	10	16	8	3

Transition T2A
State 1 to 2

With heavy continuous grazing, no brush management, no pest management, no fire, and brush invasion have led to a transitional shift from a Grassland State to a Shrubland State.

Restoration pathway R2A
State 2 to 1

With the implementation of various conservation practices such as Prescribed Grazing with rest periods during the growing season, Brush Management using chemical or mechanical control, Pest Management, and Range Planting, the Shrubland State can be restored to the Grassland State.

Conservation practices

Brush Management
Range Planting
Integrated Pest Management (IPM)
Prescribed Grazing

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					

1	**Midgrasses**			560–785	
	sideoats grama	BOCU	*Bouteloua curtipendula*	224–336	–
	blue grama	BOGR2	*Bouteloua gracilis*	224–314	–
	little bluestem	SCSC	*Schizachyrium scoparium*	112–135	–
2	**Tallgrasses**			140–179	
	sand bluestem	ANHA	*Andropogon hallii*	140–179	–
	Indiangrass	SONU2	*Sorghastrum nutans*	140–179	–
3	**Cool-season grasses**			140–179	
	Canada wildrye	ELCA4	*Elymus canadensis*	140–179	–
	needle and thread	HECO26	*Hesperostipa comata*	140–179	–
	western wheatgrass	PASM	*Pascopyrum smithii*	140–179	–
4	**Mid and shortgrasses**			202–269	
	buffalograss	BODA2	*Bouteloua dactyloides*	112–224	–
	vine mesquite	PAOB	*Panicum obtusum*	112–224	–
	large-spike bristlegrass	SEMA5	*Setaria macrostachya*	112–224	–
	Arizona cottontop	DICA8	*Digitaria californica*	112–202	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	112–168	–
	hooded windmill grass	CHCU2	*Chloris cucullata*	112–168	–
5	**Mid and shortgrasses**			191–269	
	black grama	BOER4	*Bouteloua eriopoda*	112–168	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	84–168	–
	ear muhly	MUAR	*Muhlenbergia arenacea*	84–140	–
	tumble windmill grass	CHVE2	*Chloris verticillata*	56–112	–
	fall witchgrass	DICO6	*Digitaria cognata*	56–112	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	84–112	–
	gummy lovegrass	ERCU	*Eragrostis curtipedicellata*	28–84	–
Forb					
6	**Forbs**			67–90	
	Forb, annual	2FA	*Forb, annual*	28–67	–
	white sagebrush	ARLUM2	*Artemisia ludoviciana ssp. mexicana*	28–67	–
	lyreleaf greeneyes	BELY	*Berlandiera lyrata*	28–67	–
	golden prairie clover	DAAU	*Dalea aurea*	28–67	–
	purple prairie clover	DAPUP	*Dalea purpurea var. purpurea*	28–67	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	28–67	–
	kisses	GASU2	*Gaura suffulta*	28–67	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	28–67	–
	dotted blazing star	LIPU	*Liatris punctata*	28–67	–
	littleleaf sensitive-briar	MIMI22	*Mimosa microphylla*	28–67	–
	Fendler's penstemon	PEFE	*Penstemon fendleri*	28–67	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	28–67	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	28–67	–

Shrub/Vine					
7	**Shrubs/Vines**			67–90	
	sand sagebrush	ARFI2	*Artemisia filifolia*	67–90	–
	yucca	YUCCA	*Yucca*	67–90	–
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	28–56	–

Animal community

Lack of cover limits the species that use this site as habitat. Usually, only species native to the plains grasslands will be seen. Plains grassland birds and mammals frequent the site. Scaled quail, coyotes, various raptors, song birds such as the meadow lark, Texas horned lizard, jackrabbit, and other species prefer an open grassland. Prairie dog towns are occasionally found in the region. Mule deer are sometimes observed browsing forbs and yucca blooms growing on the site. Pronghorn antelope favor this site and small bands are often seen.

Hydrological functions

This site captures nearly most of the water that falls on it, provided the vegetation is in good condition. The sandy loam soil infiltrates water fairly rapidly. There is not significant runoff if cover is good. With poor cover, runoff is significant and small gullies can develop.

Recreational uses

Hunting, Camping, Hiking, Bird watching, Photography, Horseback riding.

Wood products

None.

Other products

None.

Other information

None.

Inventory data references

NRCS FOTG – Section II of the FOTG Range Site Descriptions and numerous historical accounts of vegetative conditions at the time of early settlement in the area were used in the development of this site description. Vegetative inventories were made at several site locations for support documentation.

Inventory Data References: (documents)

NRCS FOTG – Section II - Range Site Descriptions
NRCS Clipping Data summaries over a 20 year period

Other references

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)
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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
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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, 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):** 20-25%.

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):** None to slight.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderate resistance to surface erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Fine sandy loam; friable surface; and medium SOM.

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

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 midgrasses > Warm-season shortgrasses >

    Sub-dominant: Warm-season tallgrasses = Cool-season grasses >

    Other: Shrubs/Vines = Forbs

    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):** 1,400 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 yucca 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 or intense wildfires.