USDA Natural Resources
Conservation Service

Ecological site R070BY670TX
Sandy Loam 12-18" 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.

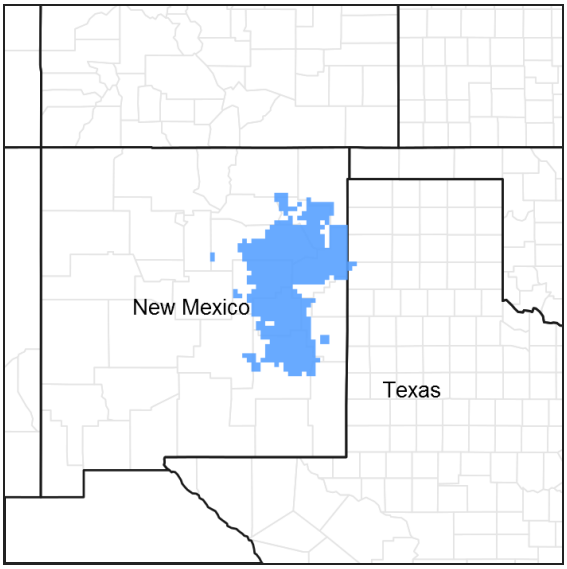


Figure 1. Mapped extent

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): 070B–Pecos and Canadian River Basins

MLRA 70B is characterized by broad, rolling piedmonts, plains, and tablelands broken by drainageways and tributaries of the Pecos River. Native vegetation is mid- to short-grass prairie species in the lowlands, with pinyon and juniper in the higher elevations and on steeper north-facing slopes. Current land use is predominantly livestock grazing. The soils formed in material weathered from sedimentary rocks of Cretaceous age.

Classification relationships

This site was formerly known as Sandy Loam R070XB054NM in New Mexico.

Ecological site concept

The central concept of this site is soils with fine sandy loam surface textures. Slope ranges from 0 to 10 percent. Parent material is alluvial and/or eolian material of Triassic red-bed origin.

Associated sites

R070BY662TX	**Clayey 12-18" PZ** Clayey soils with tobosagrass and cholla.
R070BY663TX	**Clay Loam 12-18" PZ** Loamy soils with shortgrasses dominating the site.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

The Sandy Loam site occurs on alluvial/colluvial fan terraces and hillslopes. Land surfaces vary from slightly convex to slightly concave. Due to the nature of this site, these fans and footslopes generate runoff received by lower positioned sites. This generally depends on the amount of vegetative cover and intensity of precipitation events. Grazing accessibility for livestock and wildlife is good.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plain (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	1,036–1,372 m
Slope	0–10%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area can be classified as “semi-arid continental”. Summers are hot with winters being generally mild with numerous cold fronts that drop temperatures into the single digits for 24 to 48 hours. Temperature extremes are the rule rather than the exception. Humidity is generally low and evaporation high. Canadian and Pacific cold fronts come through the region in fall, winter, and spring, and resulting temperature changes can be rapid.

Total annual precipitation averages 12 to 18 inches. Most of the precipitation comes in the form of rain during the period from May through October. Snowfall averages around 20 inches but ranges from 10 to 36 inches. Rainfall in the growing season often comes as intense showers of relatively short duration. Long-term droughts occur on the average of once every 20 years and may last as long as five to six years. During these drought years moisture during the growing season is from 50 to 60 percent of the mean. Based on long-term records, approximately 60 percent of years are below the mean rainfall and approximately 40 percent are above the mean. May, June ,and July are the main growth months for perennial warm-season grasses. Forbs perform their growth somewhat earlier.

Low air temperatures vary from a monthly mean of 20 degrees F in January to 64 degrees F in July. Mean daily maximum temperatures average in the upper 80’s and low 90’s during the summer months. Winter minimum temperatures fall below the freezing mark much of the time from November through March, with daily lows sometimes reaching 10 degrees F in December and January. Dates of the last killing frost may vary from April 15 to April 22, and the first killing frost from October 15 to October 24.

Winds prevail from the south and southwest, with an average velocity of 12 miles per hour. Generally, March is the windiest month. Strong winds during the spring cause rapid drying of the soil surface.

Table 3. Representative climatic features

Frost-free period (average)	200 days
Freeze-free period (average)	205 days
Precipitation total (average)	457 mm

Influencing water features

None.

Soil features

These are deep to very deep fine sandy loam soils that are derived from red bed formations of late Triassic-aged sandstone and shale. Parent material is calcareous alluvial and eolian sediments. Slopes dominantly range from 0 to 10 percent. Some of these soils have argillic horizons of sandy clay loam texture. They are moderate in fertility, have a low to moderate water storage capacity, have a moderate infiltration rate, and exhibit negligible to low runoff depending on slope and vegetative cover. These soils yield water to plants readily 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: Ima fine sandy loam and Redona fine sandy loam.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Fine sandy loam (2) Sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–17.78 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–1 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–1
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–15%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

This is an upland grassland site occurring on nearly level to moderately sloping topography. The Reference Plant Community is best characterized as warm-season mid-grasses with somewhat lesser amounts of short-grass species and scattered short shrubs. Tallgrasses occur but are somewhat infrequent, and are found in micro

environments that receive extra runoff. Perennial and annual forbs make up from 5 to 10 percent of total annual production, depending upon precipitation. Shrubs account for approximately 5 to 8 percent of total annual production, with some variation in species often occurring from one locality to another. Production levels are moderate to moderately high, and accessibility for grazing and browsing animals is good. Bunchgrasses are most prevalent with lesser amounts of sod-forming species. Inherent fertility is moderate and the site is favored by domestic livestock. Diversity is high in the reference community, but will decrease with long-term, heavy grazing pressure. This site is fairly extensive within the MLRA and may encompass both large and small acreages depending on location.

The reference grassland community consists predominantly of sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), and black grama (*Bouteloua eriopoda*), with smaller amounts of vine mesquite (*Panicum obtusum*), wolfstail (*Lycurus phleoides*), galleta (*Pleuraphis jamesii*), fall witchgrass (*Digitaria cognata*), sand dropseed (*Sporobolus cryptandrus*), Hall's panicum (*Panicum hallii*), plains bristlegrass (*Setaria leucopila*), perennial threeawn (Aristida spp.), hairy grama (*Bouteloua hirsuta*), gummy lovegrass (Eragrostis curtipendicellata), and sand muhly (*Muhlenbergia arenicola*). A few cool-season species such as needle and thread (*Hesperostipa comata*), Canada wildrye (*Elymus canadensis*), and bottlebrush squirreltail (Sitanion hystrix) will be found, and are most prevalent in years when winter moisture is above normal. Small amounts of little bluestem (*Schizachyrium scoparium*) occur in inclusions of shallow sandy loams or in areas where slightly sandier textures occur. Sand bluestem (*Andropogon hallii*) and Indiangrass (*Sorghastrum nutans*) will be found in micro environments within the site where moisture is more favorable. Tallgrasses generally do not make up more than 5 to 10 percent of the total plant community. Some of the more prevalent forb species are scarlet globemallow (*Sphaeralcea coccinea*), rushpea (Hoffmannseggia jamesii), catclaw sensitivebriar (*Mimosa roemeriana*), dotted gayfeather (*Liatris punctata*), sand lily (*Mentzelia nuda*), western ragweed (*Ambrosia psilostachya*), trailing ratany (Krameria sp.), lyreleaf greeneyes (Berlandiera larata), plains zinnia (*Zinnia grandiflora*), wild alfalfa (*Psoralidium tenuiflorum*), scarlet gaura (*Gaura coccinea*), and croton (Croton spp.). Forb production tends to be very moisture-dependent and can vary considerably from year to year. The suffrutescent half-shrub broom snakeweed (*Gutierrezia sarothrae*) is found in small amounts and can sometimes increase with abusive grazing. Woody short shrub species most commonly found are sand sagebrush (*Artemisia filifolia*), plains yucca (*Yucca glauca*), Mormon tea (*Ephedra antisyphilitica*), and winterfat (*Krascheninnikovia lanata*). Mesquite (*Prosopis glandulosa*), cholla (*Cylindropuntia imbricata*), and pricklypear (*Opuntia macrorhiza*) are found in small amounts. Shrubs tend to be scattered, but yucca, mesquite, and sand sagebrush can increase with abusive grazing practices and no natural fire.

General observations would suggest that blue grama, black grama, and lesser amounts of other short-grass species are now dominating many of the sandy loam sites in this MLRA. In many cases, there are only small amounts of sideoats grama present, and that species was almost certainly present in greater amounts in the reference community, especially on the sandy loams that have a coarse-loamy classification. The tighter sandy loams (fine-loamy classification) tend to produce somewhat more blue grama and less sideoats grama. Continuous moderate grazing will usually result in an increase in blue and black grama over time, and a decrease in sideoats grama. Prolonged abusive grazing practices will nearly always result in a significant increase in perennial threeawn, sand dropseed, hairy grama, sand muhly, gummy lovegrass, and annual forbs. Sand sagebrush and yucca are both increasers on this site. Yucca can sometimes increase to a moderate plant population (greater than 1000 crowns per acre), but the sand sagebrush does not usually form a dense canopy. If a seed source is available, mesquite can also invade the site. The Sandy Loam ecological site appears to be somewhat less resistant to grazing-induced changes in plant community than the associated Clay Loam or Loamy sites. The plant community can shift to a short-grass dominated site with very few mid-grasses if heavy grazing pressure is applied over several years. The shorter grass species such as blue grama, buffalograss (*Bouteloua dactyloides*), and even black grama are more resistant to grazing pressure. After many years of continuous heavy grazing, sideoats grama will still be found in the community, but will retreat to the protection of clumps of yucca, sand sagebrush, or other short shrubs. With good grazing management practices, selective brush management, and growing season rest, the balance between mid- and short-grasses can often be restored, but it will usually take a few years to do so. The more dominant the short-grass species become, the more difficult it is to restore the community balance. Some above-average precipitation in conjunction with prescribed grazing speeds this process a great deal. Careful grazing management techniques are essential to maintain the diversity and productivity of the reference community.

All the sites in this MLRA were historically grazed/browsed by bison, elk, pronghorn, and mule deer (along with numerous small herbivores such as prairie dogs, rabbits, ground squirrels, etc.) in pre-settlement times. The habits of the larger herbivores were semi-migratory and after grazing an area, they moved on to other localities where grazing resources were more attractive. Grazed areas received rest naturally and generally the recovery periods

following grazing were adequate for vegetation to regain vigor and replenish reserves. The same locations might not have been grazed again for several months, and perhaps even years, depending on rainfall patterns and animals' movements. When grazing occurred, it was likely quite intense, and in some cases, the physical animal impact may have been significant, but the recovery period allowed for plant and soil resources to heal prior to being impacted again. This MLRA has always had fewer water resources than vegetative regions to the east, and this may have had some influence on the magnitude of the large herd effect of bison on grazing resources. The huge seasonal migrations of bison required dependable water sources that could supply sufficient water for large numbers of animals and be reached within a day or two. The drier western parts of the plains in which this MLRA resides do not have nearly as many water sources as do the Texas Rolling Plains located to the east of the Llano Estacado. However, the grasslands in this MLRA did develop under an ecology that included native grazing animals as an integral part of the processes. With settlement of the area, the development of the ranching industry, and especially the advent of barbed wire, the confinement of domestic livestock on smaller areas has had great effect on plant communities. Free-ranging animals that moved at will depending on locally available forage provided a graze/rest cycle that allowed the natural recovery of native plants, whereas the system of more continuous grazing employed post-settlement, usually does not meet the overall needs of native vegetation unless careful management practices are implemented. Also, there is considerable evidence that overstocking of the range occurred in the late 1800’s and early 1900’s, and, unfortunately, it still does today in some places. Much of the rangeland abuse that occurred was due to lack of knowledge of the capability of the resources.

Natural fire has also had an impact on these grasslands historically. It is accepted that natural fires occurred on the plains fairly frequently, at least every 8 to 10 years, with some areas burning even more frequently. The sites most likely to be burned were those where grass fuel was most abundant. The sandy loam site has historically produced moderate amounts of fine fuel, and its physiographic features would suggest that fire may have occurred with some regularity. The type of adjacent sites and the general topographic and vegetative attributes of those sites also had a major effect on the frequency of fire. In this MLRA, there are sites that exhibit large amounts of bare soil and rocky terrain with sparse plant cover, as well as sites that have physical barriers such as gullies, streambeds, etc. that could have limited fire movement and continuity. It is possible to say that where fire occurred with regularity, it had a major impact on maintaining grasslands and retarded the encroachment of woody shrubs and cacti in many areas. Fire also influenced the grazing habits of herbivores, as they were attracted to the fresh and succulent vegetation that often resulted after a natural fire. Community diversity, especially an increase in forb species most likely resulted from a natural fire. Prescribed fire can be utilized on certain sites under proper conditions as a management tool. It can, in some instances be used to retard the proliferation of certain woody species, and can be used on coarse grasses such as alkali sacaton (*Sporobolus airoides*), giant sacaton (*Sporobolus wrightii*), or tobosagrass (*Pleuraphis mutica*) to increase palatability. It should be noted that fire followed by a series of below average rainfall years can definitely have an adverse effect on some perennial grass species. Extreme care and attention to environmental factors should always be exercised when using fire as a tool, and becomes even more important in arid and semiarid regions.

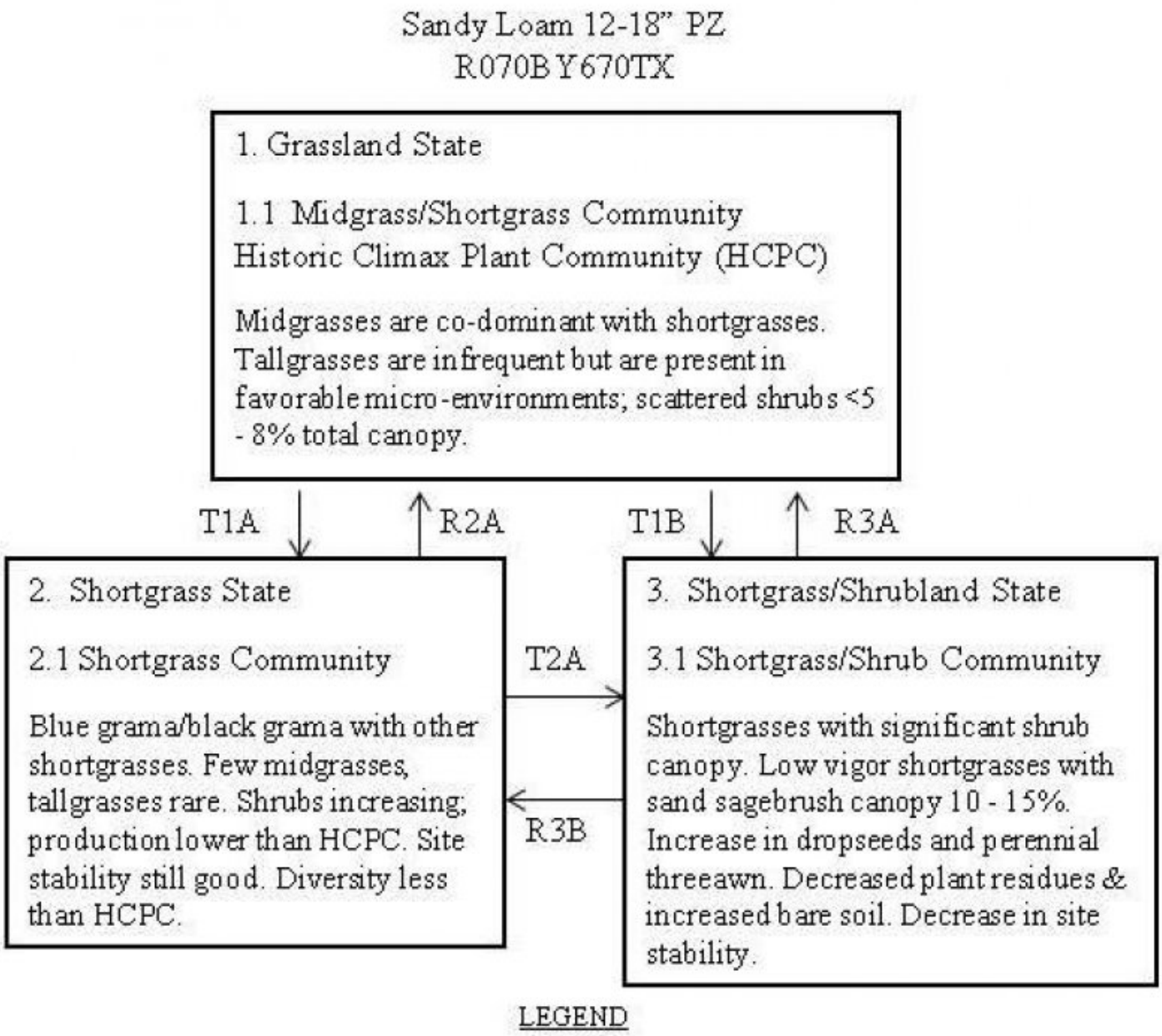
When the ecological principles affecting plant communities are understood and when proper rangeland management practices such as prescribed grazing and selective control of invasive species are implemented, the native range can often approach the diversity and productive capacity of the reference plant community. Even abused ranges can recovery with time and good 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.

State and transition model



State 1
Grassland State

The Grassland State is best characterized as warm-season mid-grasses with somewhat lesser amounts of short-grass species and scattered short shrubs. Tallgrasses occur but are somewhat infrequent, and are found in micro

environments that receive extra runoff. Perennial and annual forbs make up from 5 to 10 percent of total annual production. Shrubs account for approximately 5 to 8 percent of total annual production, with some variation in species often occurring from one locality to another. Bunch grasses are most prevalent with lesser amounts of sod-forming species. Annual production reaches 1,750 pounds per acre.

Community 1.1
Midgrass/Shortgrass Community

Figure 4. 1.1 Midgrass/Shortgrass Community

The Midgrass/Shortgrass Community (1.1) is the interpretive plant community for the Sandy Loam ecological site. Sideoats grama makes up approximately 15 to 25 percent of the total production and blue grama and black grama make up approximately 30 to 45 percent. Other short- and mid-grasses account for approximately 20-25 percent while forbs make up approximately 8-10 percent. Shrubs make up from 5 to 10 percent of total production. Production is moderately high compared to other sites in the MLRA, and in general averages from 1,000 to 1,500 pounds per acre of dry weight. The production shown in the photo below is probably on the upper end of the range for this site. With long-term grazing pressure and no natural fire, this site will move toward a short-grass-dominated community with an increase in shrubs such as yucca, sand sage, or mesquite. The photo below depicts the presence of scattered amounts of yucca and only occasional mesquite. In pre-settlement times, shrubs were probably even less represented than this photo shows. However, this example is very close to what the HCPC was according to the best information obtainable. Yucca seems to be a strong increaser on this site. Periodic fire probably suppressed yucca as well as other woody plants in the HCPC. This site is not as resistant to grazing-induced changes as the Hardland sites are. Blue grama will definitely increase with long-term grazing pressure, diversity will decrease, and production will be lowered.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	975	1339	1704
Forb	78	112	146
Shrub/Vine	56	84	95
Microbiotic Crusts	11	17	17
Tree	–	–	1
Total	**1120**	**1552**	**1963**

Figure 6. Plant community growth curve (percent production by month). TX0256, Midgrass/Shortgrass Community. Warm-season mid and shortgrasses with scattered shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	5	9	21	26	8	5	10	8	4	1

State 2
Shortgrass State

There has been a decrease in mid-grasses, an increase in both blue and black grama production, and some minor increases in the shrub component (mainly mesquite and sand sagebrush). The amount of perennial forbs has decreased somewhat from that of the HCPC, but that may be due to moisture fluctuations more than grazing management. The production level is less than in the HCPC, which approaches 1,445 pounds.

Community 2.1
Shortgrass Community

Figure 7. 2.1 Shortgrass Community

The Shortgrass Community (2.1) shows some noticeable differences from the HCPC. There has been a decrease in mid-grasses, an increase in both blue and black grama production, and some minor increases in the shrub component (mainly mesquite and sand sagebrush). Site stability is intact and the basic plant community functions have not been dramatically affected. The amount of perennial forbs has decreased somewhat from that of the HCPC, but that may be due to moisture fluctuations more than grazing management. The production level is less than that of the HCPC. Sideoats grama is present in this community, but is somewhat infrequent while short-grasses dominate. With careful grazing management, this community may be moved towards the HCPC. At this point, the shrub component is not a major concern, although mesquite can increase on this site even with good management. Some individual plant treatment may be in order soon, provided the objective is to maintain the site in a grassland state.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	616	1121	1457
Shrub/Vine	56	67	90
Forb	34	56	67
Microbiotic Crusts	6	6	6
Tree	–	–	1
Total	**712**	**1250**	**1621**

Figure 9. Plant community growth curve (percent production by month). TX0251, Shortgrass Community with few shrubs. Warm-season shortgrass dominant community with few shrubs and forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	5	10	22	25	10	5	9	8	2	1

State 3

Shortgrass/Shrubland State

There are only small amounts of mid-grasses present. Short-grasses dominate with a significant increase in sand sagebrush and more open turf. There has also been an increase in broom snakeweed, perennial threeawn, and dropseeds. There has also been an increase in bare ground. Blue grama is the dominant short-grass species. Vigor of the blue grama is low, and some increase in annual forbs is visible.

Community 3.1
Shortgrass/Shrub Community

Figure 10. 3.1 Degraded Shortgrass Community

This community exhibits considerable departure from the HCPC. There are only small amounts of mid-grasses present. Short-grasses dominate with a significant increase in sand sagebrush and more open turf. There has also been an increase in broom snakeweed, perennial threeawn, and dropseeds. There has also been an increase in bare ground. Blue grama is the dominant shortgrass species. Vigor of the blue grama is low and some increase in annual forbs is visible. The plant community shows the result of long-term continuous grazing pressure and no control of woody shrubs. Once short-grasses have dominated the site for several years, it is difficult to completely recover the balance between mid- and short-grass species that exist in the HCPC. However, as long as a reasonable seed source for the mid-grass species exists, good grazing management and brush management can usually shift the plant community back toward the HCPC over time. In order to initiate a significant shift in this plant community, a prescribed grazing management plan that includes some growing season rest periods for 4 to 5 years would be necessary, along with some selected control of the more dense stands of sand sagebrush and other shrubby and weedy forbs. Of course, some favorable years of precipitation would speed up the recovery process a great deal. Stocking rate adjustments will be needed and careful monitoring done.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	516	953	1121
Shrub/Vine	56	135	157
Forb	45	90	135
Microbiotic Crusts	6	6	6
Tree	–	–	1
Total	**623**	**1184**	**1420**

Figure 12. Plant community growth curve (percent production by month). TX0257, Degraded Shortgrass Community. Warm-season shortgrasses having low production, forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4	8	10	23	23	10	5	8	4	3	1

Transition T1A
State 1 to 2

With heavy continuous grazing and no fires (over a ten to twenty year period), the Grassland State will transition into the Shortgrass State.

Transition T1B
State 1 to 3

With heavy continuous grazing, long-term droughts, brush invasion, and no brush management practices, the Grassland State will transition into the Shortgrass/Shrubland State.

Restoration pathway R2A
State 2 to 1

Conservation practices implemented such as Prescribed Grazing (which also includes growing season rest), Pest Management, and selective Brush Management (i.e. Individual Plant Treatments) over less than a five year timeframe.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

Transition T2A
State 2 to 3

Continuation of heavy continuous grazing pressure, lack of fire, brush invasion, long-term drought conditions, no brush management, no pest management, and no desirable rest periods for plant growth have allowed the Shortgrass State to transition to the Shortgrass/Shrubland State.

Restoration pathway R3A
State 3 to 1

With conservation practices such as Prescribed Grazing, growing season rests, and selective Brush and Pest Management over a five to seven year period, the Shortgrass/Shrubland State can be restored to the Grassland State.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

Restoration pathway R3B
State 3 to 2

With conservation practices such as Prescribed Grazing, Brush and Pest Management over a three to four year period, the Shortgrass/Shrubland State can be restored to the Shortgrass State.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Midgrasses**			224–415	
	sideoats grama	BOCU	*Bouteloua curtipendula*	224–392	–
	little bluestem	SCSCS	*Schizachyrium scoparium var. scoparium*	0–22	–
2	**Mid/Shortgrasses**			291–437	
	buffalograss	BODA2	*Bouteloua dactyloides*	22–34	–
	hairy grama	BOHIH	*Bouteloua hirsuta var. hirsuta*	22–34	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	22–34	–
	Arizona cottontop	DICA8	*Digitaria californica*	22–34	–
	fall witchgrass	DICO6	*Digitaria cognata*	22–34	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	22–34	–
	common wolfstail	LYPH	*Lycurus phleoides*	22–34	–
	ear muhly	MUAR	*Muhlenbergia arenacea*	22–34	–
	Hall's panicgrass	PAHA	*Panicum hallii*	22–34	–
	vine mesquite	PAOB	*Panicum obtusum*	22–34	–
	James' galleta	PLJA	*Pleuraphis jamesii*	22–34	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	22–34	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	22–34	–
3	**Shortgrasses**			448–785	
	blue grama	BOGR2	*Bouteloua gracilis*	308–448	–
	black grama	BOER4	*Bouteloua eriopoda*	140–336	–
4	**Tallgrasses**			11–67	
	sand bluestem	ANHA	*Andropogon hallii*	6–22	–
	Canada wildrye	ELCA4	*Elymus canadensis*	0–22	–
	Indiangrass	SONU2	*Sorghastrum nutans*	6–22	–
Forb					
5	**Forbs**			78–146	
	Forb, annual	2FA	*Forb, annual*	0–56	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–56	–
	lyreleaf greeneyes	BELY	*Berlandiera lyrata*	0–56	–
	yellow sundrops	CASE12	*Calylophus serrulatus*	0–56	–
	eastern daisy fleabane	ERAN	*Erigeron annuus*	0–56	–
	red dome blanketflower	GAPI	*Gaillardia pinnatifida*	0–56	–
	beeblossom	GAURA	*Gaura*	0–56	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–56	–

	collegeflower	HYFL	*Hymenopappus flavescens*	0–56	–
	trailing krameria	KRLA	*Krameria lanceolata*	0–56	–
	dotted blazing star	LIPU	*Liatris punctata*	0–56	–
	bractless blazingstar	MENU	*Mentzelia nuda*	0–56	–
	Roemer's mimosa	MIRO6	*Mimosa roemeriana*	0–56	–
	James' holdback	POJA5	*Pomaria jamesii*	0–56	–
	slimflower scurfpea	PSTE5	*Psoralidium tenuiflorum*	0–56	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	0–56	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–56	–
	Rocky Mountain zinnia	ZIGR	*Zinnia grandiflora*	0–56	–
Shrub/Vine					
6	**Shrubs/Vines**			56–95	
	sand sagebrush	ARFI2	*Artemisia filifolia*	0–56	–
	tree cholla	CYIMI	*Cylindropuntia imbricata var. imbricata*	0–56	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–56	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	0–56	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	0–56	–
	soapweed yucca	YUGL	*Yucca glauca*	0–56	–
	vine jointfir	EPPE	*Ephedra pedunculata*	0–56	–
Tree					
7	**Trees**			0–1	
	netleaf hackberry	CELAR	*Celtis laevigata var. reticulata*	0–1	–
	western soapberry	SASAD	*Sapindus saponaria var. drummondii*	0–1	–

Animal community

Mule deer and pronghorn are the principal large herbivores utilizing the community. In addition, rabbits, prairie dogs, ground squirrels, mice, and voles, and predators such as coyotes, bobcats, badgers, and raptors utilize the site. In pre-settlement times, elk and bison were present. Scaled quail can be seen frequently. The site does not have much woody cover, therefore, mainly grassland species are found.

Plant preference by animal kind:
This rating system provides general guidance as to animal preference for plant species. It also indicates possible competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community. For wildlife, plant preferences for food and plant suitability for cover are rated.

Animal Preference:
Preferred (P) – Percentage of plant in animal diet is greater than it occurs on the land.
Desirable (D) – Percentage of plant in animal diet is similar to the percentage composition on the land.
Undesirable (U) – Percentage of plant in animal diet is less than it occurs on the land.
Not Consumed (N) – Plant would not be eaten under normal conditions. It is only consumed when other forages not available.
Toxic (T) – Rare occurrence in diet and, if consumed in any tangible amounts results in death or severe illness in animal.

Hydrological functions

The site's usual position on the landscape is such that it can contribute runoff to lower-lying drainages. If good vegetative cover is not maintained, water erosion and siltation can occur. If a good plant community is maintained, runoff is very limited and little surface erosion is visible.

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

Natural Resources Conservation Service - Range Site Descriptions
USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database
Rathjen, Frederick W., The Texas Panhandle Frontier, Rev. 1998, Univ. of Texas Press
Hatch, Brown and Ghandi, Vascular Plants of Texas (An Ecological Checklist)
Texas A&M Exp. Station, College Station, Texas
Texas Tech University – Range, Wildlife & Fisheries Dept.
Wester, David; The Southern High Plains; A History of Vegetation 1540 to Present; USDA Forest Service, RMRS, 2007

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Approval

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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.

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Date	02/28/2008
Approved by	Kendra Moseley
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:** None to slight.

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):** Resistant 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 small interspaces should make rainfall impact

minimal. This site has moderate permeability, runoff is slow and available water holding capacity is high.

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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 midgrasses = Warm-season shortgrasses >

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

    Other: Forbs = Shrubs/Vines

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal mortality and decadence.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,000 - 1,750 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, Yucca, Mesquite.

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17. **Perennial plant reproductive capability:** All plants should be capable of reproduction.
