

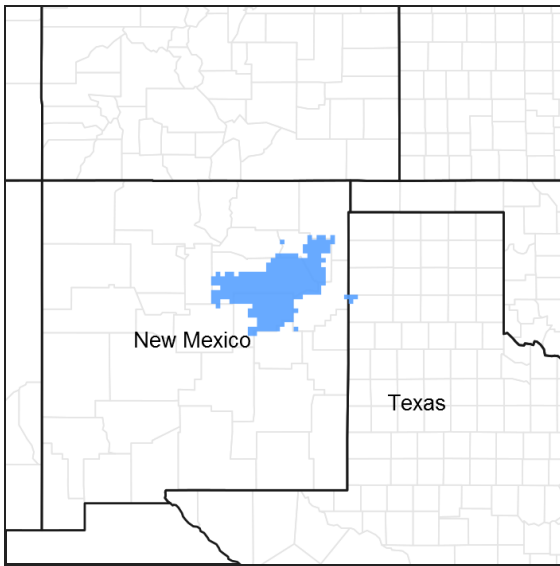
# Ecological site R070BY665TX

## Shallow Sandstone 12-18" PZ

Last updated: 9/12/2023  
 Accessed: 05/03/2024

### 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.

### Ecological site concept

This site is a complex of sandstone rock outcrop and soil. Soils are shallow or very shallow to sandstone bedrock, and typically have surface textures of loam, sandy loam, and fine sandy loam.

### Associated sites

R070BY661TX	<b>Breaks 12-18" PZ</b> Occurs adjacent to the shallow sandstone site on steeper slopes.
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R070BY670TX	<b>Sandy Loam 12-18" PZ</b> Occurs adjacent to the Shallow Sandstone site with shallow sandstone sites scattered throughout with large, exposed sandstone rock.
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### Similar sites

R070BY661TX	<b>Breaks 12-18" PZ</b> Similar to rough breaks in percentage of rock cover, but less sloping.
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

### Physiographic features

The Shallow Sandstone site occurs on convex low ridgetops and side slopes of erosional plains along drainages and on low escarpments. There are sizeable areas where up to 50 percent sandstone bedrock is exposed with areas of soil accumulation occurring randomly throughout. These bare areas quickly generate runoff from any precipitation. Sometimes rock fragments are mixed with shale and siltstone. The site can range from just a few acres to as much as two hundred acres in a single block and is usually found in association with other upland sites.

**Table 2. Representative physiographic features**

Landforms	(1) Escarpment (2) Ridge (3) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	1,006–1,615 m
Slope	0–50%
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 very shallow to shallow, poorly-developed, sandy loam soils with rock outcrops common. In many cases the rock occurs as slabs of sandstone with soil material collecting in depressions in the rock. There are areas within the site where shallow sandy and loamy textured soils have developed. Geologic erosion has stripped away soil material exposing bedrock on much of the site. These layers of sandstone bedrock may make up as much as 50 percent of the surface. Where some soil development has occurred, small rocks or gravels are present. Available water holding capacity is low, as is inherent fertility. Runoff is high and plant root growth is limited due to shallow soil depth. Cracks in the underlying bedrock can allow some water penetration, and plant roots often access this moisture. The sandstone parent material is constantly undergoing weathering and some of the weathered material collects in small depressions. Plant roots can sometimes penetrate into the cracks and even into softer parts of the sandstone during wet periods.

Major Soil Taxonomic Units correlated to this site include: Lacoca loam, Lacoca fine sandy loam, Lacoca sandy loam, or their gravelly counterparts.

**Table 4. Representative soil features**

Parent material	(1) Residuum–sandstone
Surface texture	(1) Gravelly loam (2) Fine sandy loam (3) Sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	10–51 cm
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–35%
Available water capacity (0-101.6cm)	4.32–9.14 cm
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4

Subsurface fragment volume <=3" (Depth not specified)	0–35%
Subsurface fragment volume >3" (Depth not specified)	0–35%

## Ecological dynamics

This is an upland site found on ridges, along draws, and on low escarpments within a rolling plains aspect. In historic climax, it is dominated by mid-grasses with a large compliment of short-grasses and perennial forbs, along with a variety of short shrubs. There are a few tallgrasses present in areas of more favorable moisture regime, such as in small depressions where some soil material has accumulated. Many of the short shrubs appear to have their origin in the larger cracks in the sandstone parent material. There is probably both soil material and moisture accumulation in some of these cracks that make germination and establishment of shrubs possible. Plant basal cover is generally sparse, but varies within the site. Lack of inherent fertility may render some plant species less palatable on this site as compared to sites with deeper soils. Over-utilization by herbivores, especially cattle, is not as likely to be a serious problem compared with some of the more productive, adjacent sites. There is a good diversity of species and these are well distributed between grasses, forbs, and short shrubs. In general, this site does produce some valuable browse plants for deer and pronghorn. It is not an extensive site, usually being of rather small acreages. It is unique and very instructive in the areas of geology and plant diversity.

The historic plant community is basically mid-grasses and short-grasses, with several short-statured shrubs present. Grasses consist of sideoats grama (*Bouteloua curtipendula*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), hairy grama (*Bouteloua hirsuta*), black grama (*Bouteloua eriopoda*), galleta (*Pleuraphis jamesii*), wolftail (*Lycurus phleoides*), sand dropseed (*Sporobolus cryptandrus*), New Mexico feathergrass (*Hesperostipa neomexicana*), and perennial threeawn (*Aristida* sp.). A few tallgrasses such as sand bluestem (*Andropogon hallii*) and Indiangrass (*Sorghastrum nutans*) are present in micro-environments where extra runoff can accumulate. Major forb species include plains actinea (*Tetraneris scaposa*), dotted gayfeather (*Liatris punctata*), plains blackfoot (*Melampodium leucanthum*), Mexican sagewort (*Artemisia ludoviciana*), sand lily (*Mentzelia nuda*), baby white aster (*Leucelene ericoides*), plains zinnia (*Zinnia grandiflora*), broom nailwort (*Paronychia jamesii*), and broom snakeweed (*Gutierrezia sarothrae*). Shrubs include feather dalea (*Dalea formosa*), skunkbush sumac (*Rhus aromatica*), plains greasebush (*Glossopetalum planitierum*), catclaw mimosa (*Mimosa aculeaticarpa* var. *biuncifera*), and vine ephedra (*Ephedra antisyphilitica*). Brownspine pricklypear (*Cylindropuntia californica*) is the most common cactus. Occasional shrubby mesquite (*Prosopis glandulosa*) occurs as well. There are rare occurrences of small hackberry (*Celtis laevigata reticulata*) and western soapberry (*Sapindus saponaria*).

In addition to the sandstone-derived soils, the ecology of the site has been shaped by climate and, perhaps to a lesser degree, by natural fires. The harsh climatic extremes play a major role in determining the mixture of species occupying the site. Limited rainfall, high evaporation rates, and almost constant winds demand a plant community of tough, deep-rooted perennial species. Periodic drought and temperature extremes also play a major role in determining the climax plant community. Natural fire was a factor in site ecology, but probably played less of a role on this site than on adjacent sites that produced greater quantities of fine fuel and provided the kind of fuel continuity necessary to carry a fire. The sparseness of vegetation and the accompanying rock cover on the site would hinder fire movement. In general, it is thought that wildfires occurred in this region every 8 to 15 years on the average.

In above-average rainfall years, portions of the site would have produced sufficient fine fuel to burn, but it is unlikely that much of the site would ever be exposed to fire.

In observing recent wildfires that have occurred, areas of the Shallow Sandstone site are generally left unburned. It is possible that protection from the intense natural fires partially explains the diversity of short shrubs present on the site, although there may be other explanations.

Large herbivores such as bison, elk, pronghorn, and mule deer were present in pre-settlement times and mule deer and pronghorn can still be found today. When the bison migrated through the area in huge herds, vegetation was subjected to heavy periodic grazing pressure and trampling. Old bison trails are still visible cutting across some of the sandstone slabs making up this site. Periodic grazing and browsing by large herbivores followed by long recovery periods helped to shape the historic plant community. Small herbivores such as rabbits, ground squirrel,

and various species of mice and voles used the site to forage and to take refuge in cracks in the rocks and beneath the numerous overhangs. Predators like the coyote, fox, lobo wolf, and even bear were common in pre-settlement times, and ringtails and raccoons like to forage in the rocks and clefts. All these except the wolf and the bear are still present. Native Americans sometimes left their artwork chiseled into the sandstone rocks located near water sources.

Over time, naturally occurring geologic erosion has changed this site. As soil is removed by the action of water and wind, and more sandstone rock exposed, the plant community is called upon to adapt and change also. As erosion occurs, small areas of deposition also occur. Plants take advantage of this and form small colonies in these more favorable micro-climates. Since this site produces a good variety of browse species, pressure from a growing deer or pronghorn population might occur, but this is usually not evident today. It is possible that heavy grazing by sheep in the late 1800's could have had an effect on the plant community, but there have been no sheep present in this region for over 100 years.

The assumed historic plant community for this site can be found on well-managed ranches in this MLRA. Since abusive grazing by livestock is rare on this site, and there does not appear to be any significant invasion of cacti or documented increase of woody shrubs, there is no conclusive evidence that the plant community was much different in pre-settlement times. There are sometimes individual sites where there are a few oneseed junipers present, but this does not appear to be due to any management-related cause. In centuries past, the bison may have disturbed these sites by trampling more than any present day domestic livestock activity. Soil type and climate (including severe drought conditions) are probably the greatest influencing factors to the plant community. However, abusive grazing practices could certainly play a part in site deterioration. If the adjacent, more-productive and preferred sites were to be abused, then livestock could be forced to utilize the shallow sandstone site, when under proper stocking and prescribed grazing, it would be little-utilized. There are some subtle changes from one particular shallow sandstone site to another, with one of the noticeable differences being the amount and species of short shrubs present. There are portions of the site where shrubs may visually be the dominant class of vegetation, and other areas where grasses and forbs dominate. These differences appear to be within natural ranges.

This is a unique site both geologically and vegetatively. The historic climax plant community exhibits considerable species diversity, and the soil forming processes and the hydrologic processes can be observed more readily here than on other sites in the MLRA. Although damage from livestock traffic would be rare, the land user should be conscious of the fragile plant community on selected areas. Improper land treatment could accelerate erosion and lead to site deterioration. As previously stated, over-browsing by deer (or sheep and goats) could negatively affect the vegetative resource on the site.

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

#### Narrative:

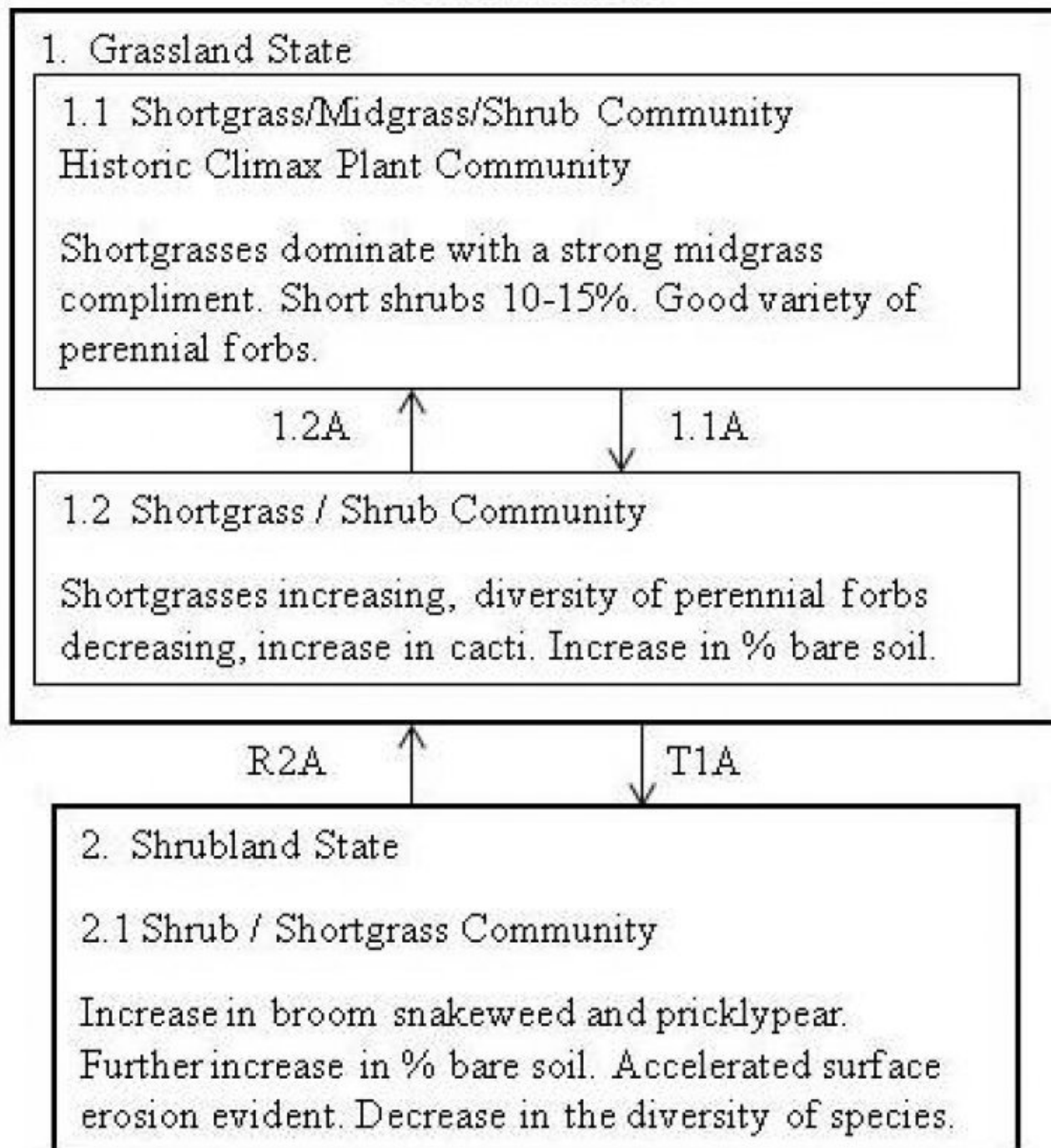
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.

\*As stated in the ecological dynamics section, the plant communities occurring on this site are most dependent on climate, the extent of soil development, and hydrologic factors. Management and fire played a secondary role.

## State and transition model

Shallow Sandstone 12-18" PZ

R070B Y665TX



LEGEND

1.1A Heavy Continuous Grazing, No Fire

1.2A Prescribed Grazing

T1A Heavy Continuous Grazing, No Fire, Long-term Drought, No Brush Management

R2A Prescribed Grazing, Growing Season Rests, Individual Plant Treatment

## Grassland State

In historic climax it is dominated by mid-grasses with a large compliment of short-grasses and perennial forbs, along with a variety of short shrubs. There are a few tallgrasses present in areas of more favorable moisture regime, such as in small depressions where some soil material has accumulated. Many of the short shrubs appear to have their origin in the larger cracks in the sandstone parent material. There is probably both soil material and moisture accumulation in some of these cracks that make germination and establishment of shrubs possible. Plant basal cover is sparse generally, but varies within the site. Lack of inherent fertility may render some plant species less palatable on this site as compared to sites with deeper soils. Over-utilization by herbivores, especially cattle, is not as likely to be a serious problem compared with some of the more-productive, adjacent sites. There is a good diversity of species and these are well distributed between grasses, forbs and short shrubs.

### Community 1.1 Shortgrass/Midgrass/Shrub Community



Figure 4. 1.1 Midgrass/Shortgrass/Shrub Community

The Shortgrass/Midgrass/Shrub (1.1) historic climax plant community (HCPC) is the interpretive plant community for the Shallow Sandstone Ecological Site. This community is a midgrass/shortgrass site with scattered shrubs. Soils are shallow, being derived from sandstone rock. As much as 40 percent of the land surface is exposed, slab sandstone. Production is above average for the site. Principal plant species are sideoats grama, black grama, galleta, little bluestem, and wolfstail. Perennial forbs include plains actinia, dotted gayfeather, plains zinnia, and broom nailwort. Shrubs include skunkbush sumac, plains greasebush, feather dalea, and catclaw mimosa. Scattered pricklypear and cholla may occur. Occasional oneseed juniper and hackberry may be seen. Total annual production ranges from 440 to 775 pounds per acre. This is not a preferred site for livestock due to shallow soils and low fertility. Normally, grazing is light and not damaging to the plant community. Natural fire may have been a factor on portions of the site where sufficient fuel occurred. However, it is unlikely that much of this site burned with regularity. In the event that livestock are forced on to this site after adjoining sites are abusively grazed, damage to the plant community could occur. If wildlife populations (mule deer) reach excessive numbers, then over browsing of forbs and shrubs could occur. Should over-browsing occur, the shift toward Shortgrass/Shrub Community (1.2) begins. With prescribed grazing and individual plant treatment the plant community can be restored conditions resembling those of the HCPC.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	392	527	616
Shrub/Vine	56	112	135
Forb	34	84	95
Tree	6	11	11
Microbiotic Crusts	6	11	11
<b>Total</b>	<b>494</b>	<b>745</b>	<b>868</b>

Figure 6. Plant community growth curve (percent production by month). TX0255, Midgrass/Shortgrass/Shrubs Community. Warm season midgrasses, forbs, and short shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4	6	10	16	22	10	5	15	8	2	1

## Community 1.2 Shortgrass/Shrub Community



Figure 7. 1.2 Shortgrass/Shrub Community

The Shortgrass/Shrub Community (1.2) shows some subtle differences from the HCPC. These differences appear to be a part of natural fluctuations due to hydrology and soil factors. They do not appear to be due to management. Site stability has changed little. With abusive grazing and browsing, lack of fire, and long-term droughts, it is possible that deterioration in the plant community may move this phase towards the Shrub/Shortgrass Community (2.1). Increase in shortgrass production and decrease in midgrass production occur. Principal plant species are black grama, galleta, and wolfstail. Forb composition is similar to that of the HCPC, with the exception of an increase in broom snakeweed. Percent bare ground has increased. Annual production ranges from 390 to 740 pounds per acre annually, which is only a slight decrease from that of the HCPC. With careful grazing techniques and perhaps some selective individual plant treatment, the plant community may be driven towards the HCPC.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	308	370	616
Shrub/Vine	67	84	112
Forb	56	90	90
Tree	–	6	6
Microbiotic Crusts	6	6	6
<b>Total</b>	<b>437</b>	<b>556</b>	<b>830</b>

Figure 9. Plant community growth curve (percent production by month). TX0253, Shortgrass/Shrubs Community. Warm-season shortgrasses with increasing shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	3	5	24	24	13	8	9	7	3	1

## Pathway 1.1 Community 1.1 to 1.2





Shortgrass/Midgrass/Shrub Community



Shortgrass/Shrub Community

With Heavy Continuous Grazing pressure and no fires, the Shortgrass/Midgrass/Shrub Community will transition into a Shortgrass/Shrub Community.

### Pathway 1.2A Community 1.2 to 1.1



Shortgrass/Shrub Community



Shortgrass/Midgrass/Shrub Community

With careful grazing techniques and perhaps some selective individual plant treatment, the Shortgrass/Shrub plant community may be driven towards the HCPC.

### Conservation practices

Brush Management
Prescribed Grazing

### State 2 Shrubland State

The Shrub/Shortgrass Community (2.1) shows a less productive community of sparse vegetation. The ecological drivers are increased surface erosion from both wind and water and increase in exposed bedrock. Actual soil formation from weathered sandstone is limited. In time, weathering will increase along with deposition of soil material. Both diversity and production will gradually increase over time. It may take many years for major changes to occur.

### Community 2.1 Shrub/Shortgrass Community



Figure 10. 2.1 Shrub/Shortgrass Community

The Shrub/Shortgrass Community (2.1) shows a less productive community of sparse vegetation. The ecological drivers are increased surface erosion from both wind and water and increase in exposed bedrock. Actual soil

formation from weathered sandstone is limited. In time, weathering will increase along with deposition of soil material. Both diversity and production will gradually increase over time. It may take many years for major changes to occur. Principal species are hairy grama, perennial three-awn, broom nailwort, pricklypear, broom snakeweed, and feather dalea. Bare ground is in excess of 60 percent. Annual production ranges from 325 to 445 pounds per acre.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	168	196	224
Forb	140	168	191
Shrub/Vine	56	67	78
Tree	–	6	6
Microbiotic Crusts	–	6	6
<b>Total</b>	<b>364</b>	<b>443</b>	<b>505</b>

Figure 12. Plant community growth curve (percent production by month). TX0252, Shrub/Shortgrass Community. Warm-season shrubs and shortgrasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	5	8	18	22	8	5	11	15	4	1

## Transition T1A State 1 to 2

With abusive grazing and browsing, lack of fire, and long-term droughts, it is possible that deterioration in the Shortgrass/Shrub plant community may move this site towards the Shrub/Shortgrass Community (2.1).

## Restoration pathway R2A State 2 to 1

Conservation practices such as Prescribed Grazing with growing season rests and Brush Management (specifically Individual Plant Treatments) are implemented in order to restore the Shrubland State to the Grassland State.

### Conservation practices

Brush Management
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 (%)
<b>Grass/Grasslike</b>					
1	<b>Short/tallgrasses</b>			235–308	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	90–112	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	90–112	–
	little bluestem	SCSCS	<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	56–84	–
2	<b>Mid/shortgrasses</b>			90–168	
	Wright's threeawn	ARPUW	<i>Aristida purpurea</i> var. <i>wrightii</i>	17–28	–

	blue grama	BOGR2	<i>Bouteloua gracilis</i>	17-28	-
	hairy grama	BOHIH	<i>Bouteloua hirsuta</i> var. <i>hirsuta</i>	17-28	-
	silver beardgrass	BOLAT	<i>Bothriochloa laguroides</i> ssp. <i>torreyana</i>	17-28	-
	hairy woollygrass	ERPI5	<i>Erioneuron pilosum</i>	17-28	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	17-28	-
	slim tridens	TRMU	<i>Tridens muticus</i>	17-28	-
3	<b>tallgrasses</b>			34-56	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	22-34	-
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	11-22	-
4	<b>Mid/shortgrasses</b>			34-84	
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	6-17	-
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	6-17	-
	wolfstail	LYCUR	<i>Lycurus</i>	6-17	-
	Hall's panicgrass	PAHA	<i>Panicum hallii</i>	6-17	-
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	6-17	-
	plains bristlegrass	SEVU2	<i>Setaria vulpiseta</i>	6-17	-
<b>Forb</b>					
5	<b>Forbs</b>			34-95	
	Forb, annual	2FA	<i>Forb, annual</i>	0-6	-
	yellow sundrops	CASE12	<i>Calylophus serrulatus</i>	0-6	-
	rose heath	CHER2	<i>Chaetopappa ericoides</i>	0-6	-
	nineanther prairie clover	DAEN	<i>Dalea enneandra</i>	0-6	-
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0-6	-
	Olancha Peak buckwheat	ERWRO	<i>Eriogonum wrightii</i> var. <i>olanchense</i>	0-6	-
	spurge	EUPHO	<i>Euphorbia</i>	0-6	-
	beeblossom	GAURA	<i>Gaura</i>	0-6	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-6	-
	collegeflower	HYFL	<i>Hymenopappus flavescens</i>	0-6	-
	southern goldenbush	ISPL	<i>Isocoma pluriflora</i>	0-6	-
	trailing krameria	KRLA	<i>Krameria lanceolata</i>	0-6	-
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0-6	-
	dotted blazing star	LIPU	<i>Liatris punctata</i>	0-6	-
	bractless blazingstar	MENU	<i>Mentzelia nuda</i>	0-6	-
	evening primrose	OENOT	<i>Oenothera</i>	0-6	-
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0-6	-
	James' nailwort	PAJA	<i>Paronychia jamesii</i>	0-6	-
	woolly paperflower	PSTAC	<i>Psilostrophe tagetina</i> var. <i>cerifera</i>	0-6	-
	slimflower scurfpea	PSTE5	<i>Psoralidium tenuiflorum</i>	0-6	-
	stemmy four-nerve daisy	TESC2	<i>Tetraeneuris scaposa</i>	0-6	-
<b>Shrub/Vine</b>					

6	<b>Shrubs/Vines</b>			56-135	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	6-17	-
	Christmas cactus	CYLE8	<i>Cylindropuntia leptocaulis</i>	6-17	-
	featherplume	DAFO	<i>Dalea formosa</i>	6-17	-
	jointfir	EPHED	<i>Ephedra</i>	6-17	-
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa var. biuncifera</i>	6-17	-
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	6-17	-
	fragrant sumac	RHAR4	<i>Rhus aromatica</i>	6-17	-
	soapweed yucca	YUGL	<i>Yucca glauca</i>	6-17	-
<b>Tree</b>					
7	<b>Trees</b>			6-11	
	netleaf hackberry	CELAR	<i>Celtis laevigata var. reticulata</i>	0-6	-
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0-6	-
	honey mesquite	PRGL2	<i>Prosopis glandulosa</i>	0-6	-
	western soapberry	SASAD	<i>Sapindus saponaria var. drummondii</i>	0-6	-

## Animal community

Mule deer and Pronghorn are the main browsers. Small mammals such as mice, rats, and voles use the site for burrows and for foraging. Predators such as coyotes, bobcats, and rattlesnakes use the site for hunting and for dens. Raccoons and ringtails are also attracted to the site, especially if water is nearby. The presence of good browse plants and excellent terrain for dens and protection make it unique. This site often occurs close to streams and drainages where wildlife can access water.

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 preference for food, and plant suitability for cover are rated.

Legend: P=Preferred D=Desirable U=Undesirable N=Not Consumed T=Toxic X=Used, but not degree of utilization unknown

Preferred – Percentage of plant in animal diet is greater than it occurs on the land.

Desirable – Percentage of plant in animal diet is similar to the percentage composition on the land.

Undesirable – Percentage of plant in animal diet is less than it occurs on the land.

Not Consumed – Plant would not be eaten under normal conditions. It is only consumed when other forages not available.

Toxic – Rare occurrence in diet and, if consumed in any tangible amounts results in death or severe illness in animal.

## Hydrological functions

The exposed sandstone which makes up a significant portion of the site gives up water rapidly. This water collects in depressions and in fractures in the bedrock. The almost total runoff from the exposed rock increases the potential for soil erosion. Plant cover is sparse and is generally not sufficient for soil protection. Water moves off the site rapidly and moderate slopes prevent opportunity time for infiltration.

## Recreational uses

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

## Wood products

None.

## Other products

None.

## Other information

None.

## Inventory data references

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

Inventory Data References (documents) :

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

## Other references

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 (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

Kendra Moseley, 9/12/2023

## 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	12/21/2007
Approved by	Kendra Moseley

Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Slight to Moderate.  
\_\_\_\_\_
2. **Presence of water flow patterns:** Slight to Moderate.  
\_\_\_\_\_
3. **Number and height of erosional pedestals or terracettes:** Slight to Moderate.  
\_\_\_\_\_
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 40 to 50% bare ground.  
\_\_\_\_\_
5. **Number of gullies and erosion associated with gullies:** Slight to Moderate.  
\_\_\_\_\_
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 low SOM.  
\_\_\_\_\_
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Basal cover and density is sparse, rainfall impact significant, runoff rapid, permeability low to moderate.  
\_\_\_\_\_
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**  
\_\_\_\_\_
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 shortgrasses >>

Sub-dominant: Warm-season midgrasses > Shrubs >

Other: Warm-season tallgrasses > 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):** Minimum mortality and decadence.
- 

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):** 440 - 775 lbs/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:** Pricklypear.
- 

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