

Ecological site R077EY062TX Breaks 16-24" 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.

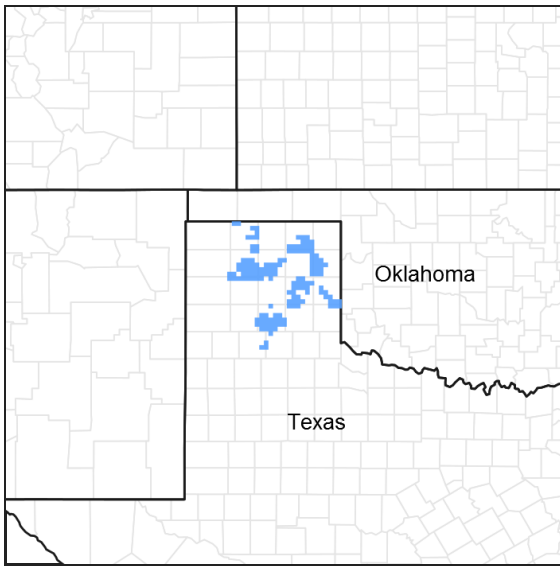


Figure 1. Mapped extent

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): 077E–Southern High Plains, Breaks

MLRA 77E occurs along moderately sloping breaks and steep escarpments associated with dissecting river systems and erosional margins of the Southern High Plains. Soil temperature regime is thermic and soil moisture regime is ustic bordering on aridic. Loamy and sandy soils are generally well drained, range from shallow to deep, and developed in Ogallala Formation sediments.

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 strongly sloping to very steep, shallow, loamy soils often intermixed with rock outcrops. The reference plant community is a mixture of grasses, forbs, shrubs, and a few trees. Vegetative cover is generally sparse. Soil depth and slope limits plant density. Percent bare ground is fairly high. There are many rocks and cobbles on the surface. The plant community varies greatly within the site according to exposure and the amount of soil material.

Associated sites

R077EY055TX	Hardland Slopes 16-24" PZ Nearly level to moderately steep fine-loamy calcareous soils on lower side slope positions. Dominantly shortgrass community with some midgrasses, forbs, and few woody species.
R077EY052TX	Draw 16-24" PZ Nearly level to very gently sloping very deep loamy soils on lower draw landscapes. Tall and midgrass species with forbs and few woody plants
R077EY057TX	Limy Upland 16-24" PZ Gently sloping to moderately sloping loamy soils with highly calcareous subsoils on lower hillslopes. Short and mid-grass dominate and with few tall grasses, perennial and annual forbs, and few woody species present.
R077EY068TX	Very Shallow 16-24" PZ Nearly level to steep, shallow and very shallow soils over caliche on lower limestone on ridges, hills, structural benches, and along escarpments. A mixture of native tall, mid and shortgrasses with forbs and scattered shrubs.
R077AY013TX	Very Shallow 16-22" PZ Nearly level to moderately sloping soils with shallow soils formed over petrocalcic horizons on higher positions. Dominated by short and midgrasses with forbs. Limited production potential due to shallow soil depth over restrictive petrocalcic.

Similar sites

R078CY006OK	Clayey Breaks Clayey soils formed in Permian age residuum on Breaks in MLRA 78C
R078CY005OK	Loamy Breaks Loamy soils formed in Permian age residuum on Breaks in MLRA 78C

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Rhus aromatica</i>
Herbaceous	(1) <i>Bouteloua curtipendula</i> (2) <i>Schizachyrium scoparium</i>

Physiographic features

This site is classified as an upland. It occurs as moderately sloping to very steep hillslopes located just below the escarpment knickpoint where the flat portions of the High Plains are incised by major drainages. These breaks can occur as abrupt, nearly vertical canyon walls, or as more rounded steep hills and associated colluvial slopes below. Geologically speaking, this is the advancing erosional front that is very slowly back-wearing into the flat plains.

Table 2. Representative physiographic features

Landforms	(1) Plains > Escarpment (2) Plains > Hillslope (3) Plains > Scarp slope
Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	610–1,372 m
Slope	8–60%

Aspect	Aspect is not a significant factor
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Table 3. Representative physiographic features (actual ranges)

Runoff class	High to very high
Flooding frequency	None
Ponding frequency	None
Elevation	610–1,372 m
Slope	8–80%

Climatic features

Climate is a cold semi-arid steppe (Koppen-Geiger classification BSk). Summers are hot and winters are cold. Temperature extremes are common. Humidity is generally low, evaporation is high, and short-term droughts are common. Average annual wind speed is 12 mph with highest winds in early spring. The prevailing wind direction is south. Summertime brings strong high pressure systems that build into heat domes with highs in the upper 90 to mid-100 degree F range. Evaporation in summer is high and open pan evaporation exceeds 6 feet per year. Early autumn temperatures are mild, with Canadian and Pacific cold fronts bringing cold air in mid-autumn throughout winter. Arctic air can settle in and dominate for several weeks during winter with very cold air in place for 2 to 3 weeks at a time.

Most of the precipitation comes in the form of rain from May through September. Rainfall events often occur as intense showers of relatively short duration. Snowfall average is about 17 inches but is also variable from 8 to 36 inches annually. Long term droughts are likely to occur every 15 to 20 years and may last 4 to 5 years. Mean precipitation is around 21 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% that precipitation will fall between 14 to 24 inches. Growing season averages 190 days. Average first frost is around October 22, and the last freeze of the season occurs around April 15.

Table 4. Representative climatic features

Frost-free period (characteristic range)	146-164 days
Freeze-free period (characteristic range)	184-194 days
Precipitation total (characteristic range)	508-610 mm
Frost-free period (actual range)	144-176 days
Freeze-free period (actual range)	180-198 days
Precipitation total (actual range)	483-660 mm
Frost-free period (average)	156 days
Freeze-free period (average)	189 days
Precipitation total (average)	559 mm

Climate stations used

- (1) GATE [USC00343489], Gate, OK
- (2) FOLLETT [USC00413225], Follett, TX
- (3) CANADIAN [USC00411412], Canadian, TX
- (4) SANFORD DAM [USC00418040], Fritch, TX
- (5) GUYMON MUNI AP [USW00003030], Guymon, OK
- (6) BEAVER [USC00340593], Beaver, OK
- (7) MEADE [USC00145171], Meade, KS
- (8) BOYS RANCH [USC00411000], Vega, TX
- (9) CLARENDON [USW00023072], Clarendon, TX

- (10) LIPSCOMB [USC00415247], Booker, TX
- (11) CHANNING 2 [USC00411649], Channing, TX
- (12) MIAMI [USC00415875], Miami, TX
- (13) COLDWATER [USC00141704], Coldwater, KS
- (14) REYDON 2SSE [USC00347579], Reydon, OK

Influencing water features

Non-stream characteristics: Overland flow from the flat lands above move over and down this site to the major streams below.

Stream characteristics: The site exists as a result of the formation of drainage patterns of major streams. The streams are now generally located some distance below this site on the landscape.

Wetland description

Soils in this ecological site are not part of wetland ecosystems.

Soil features

Soils are mapped for each county within the MLRA. Mapunits are representations of the major soil series component(s) and named accordingly. Each Mapunit is spatially represented on a digital soils map as polygons of different shapes and sizes. Within these Mapunits, there are often minor soil series components included. These minor components are soils that occur within a Mapunit polygon but are of small extent (15% or less of the Mapunit area). However, it is difficult to separate these minor soils spatially due to the scale of soil mapping.

Ecological sites are correlated at the component level of the soil survey. Therefore, a single Mapunit may contain multiple Ecological Sites just as it may contain multiple soil components. This is important to understand when investigating soils and Ecological Sites. A soil survey Mapunit may be correlated to a single Ecological Site based on the major component; however, there may be inclusions of areas of additional Ecological Sites which are correlated to the minor components of that particular soil Mapunit.

Soil formation is limited due to slope and geologic erosion. The exposed sediments are of upper Ogallala and High Plains origins. The caprock caliche that is exposed at the extreme upper portion of the site has its origin as leached carbonates but these have been incised and exposed therefore becoming extremely hard due to weathering. The loose sediments consist of gravelly, loamy and rocky material. In many places, the hard caliche has broken away from the upper escarpment and tumbled downslope.

Representative soil components for this site include: Ochiltree and Rough Broken Land. Some older surveys may include the Burson series.

Table 5. Representative soil features

Parent material	(1) Colluvium–arenaceous limestone
Surface texture	(1) Very gravelly, stony loam (2) Very gravelly, stony fine sandy loam (3) Loam
Family particle size	(1) Loamy (2) Loamy-skeletal
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to moderate
Depth to restrictive layer	8–51 cm
Soil depth	8–51 cm
Surface fragment cover ≤3"	10–40%
Surface fragment cover >3"	10–40%

Available water capacity (0-50.8cm)	1.27–2.54 cm
Calcium carbonate equivalent (0-50.8cm)	5–30%
Electrical conductivity (0-50.8cm)	0–2 mmhos/cm
Soil reaction (1:1 water) (0-50.8cm)	7.4–8.4
Subsurface fragment volume <=3" (0-50.8cm)	10–50%
Subsurface fragment volume >3" (0-50.8cm)	5–20%

Ecological dynamics

The information contained in the State and Transition Diagram (STD) and the Ecological Site Description was developed using archeological and historical data, professional experience, and scientific studies. The information presented is representative of a very complex set of plant communities. Not all scenarios or plants are included. Key indicator plants, animals and ecological processes are described to inform land management decisions. The reference plant community is a mixture of grasses, forbs, shrubs, and a few trees. Vegetative cover is generally sparse. Soil depth and slope limits plant density. Percent bare ground is fairly high. There are many rocks and cobbles on the surface. The mixed nature of the sediments contributes to a good variety of species. The plant community varies greatly within the site according to exposure and the amount of soil material. Generally the north and east facing exposures have a greater variety of plants present and slightly higher production overall due to more mesic conditions. Productivity is generally low and palatability of forage is less than sites with deeper soil resources. Accessibility is limited due to steep slopes.

Tall, mid and shortgrass species are found on the site along with several species of forbs and shrubs. Little bluestem (*Schizachyrium scoparium*) and sideoats grama (*Bouteloua curtipendula*) are often the most common grasses; however, other grasses such as hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*), perennial three-awn (*Aristida purpurea*), sand bluestem (*Andropogon hallii*), and Indiangrass (*Sorghastrum nutans*) are also found. The more common shrubs are feather dalea (*Dalea* spp.), skunkbush sumac (*Rhus trilobata*), and juniper (*Juniperus* spp.). Plains greasebush (*Forsellesia planitierum*) and mountain mahogany (*Cercocarpus montanus*) are found in lesser amounts. Juniper may not be present on all sites due to lack of seed source in some locations. Areas occur within the site where the shrubs may be quite prominent and make up a fairly large percent of the total biomass; and there are areas where grasses and forbs dominate. This site is not a preferred grazing area for most domestic livestock due to accessibility and shallow soils. This site is seldom heavily grazed. Browsing wildlife species such as white-tailed and mule deer frequent the site because of the good variety of forbs and shrubs providing food and cover in the canyons.

Natural fire played a role in the ecology of the site as is true for practically all High Plains ecological sites. The general effects of fire were to promote a grassland state and keep woody shrubs suppressed. However, the rocky soils and steep terrain of this site have much more influence on the plant community than does any external ecological influence. The sparse vegetation and lower production probably affected fire continuity and the heat generated by natural fire may have limited the degree of damage to woody plants. In general, when burned periodically the tallgrasses tend to benefit and shrubs are suppressed for a few years time. Non-sprouting juniper species are especially suppressed by fire. There are some of the steeper slopes and canyon walls that escape fire altogether. It does take this site longer to recover from a burn than most associated sites due to sparse plant density and dry soils.

Since the site is not normally heavily grazed, the overall ecological condition tends to not be affected as much due to animal use. There are places where on the most accessible part of the site, there is evidence of grazing by cattle. The grazing tends to be somewhat seasonal and for shorter duration than more productive less sloping terrain. Were the site grazed by, for example, goats instead of cattle, then overgrazing/browsing could be more of a potential problem. This can be observed in other areas of the country where cattle are not the principal grazers. Both species of deer utilize the site readily, but in most places, the deer population is not dense enough to place a

lot of pressure on primary browse.

A considerable amount of geologic erosion usually takes place on the site; therefore, the greatest amount of desirable plant cover that can be supported is desirable. In most cases, this site is more important for wildlife habitat than for livestock grazing, and a diverse plant community benefits those species utilizing the site, as well as promoting natural ecological processes.

State and Transition Diagram:

A State and Transition Diagram for the Breaks (R077EY062TX) site is depicted below. Thorough descriptions of each state, transition, and pathway follow the model. Experts base this model on available experimental research, field observations, professional consensus, and interpretations. It is likely to change as knowledge increases. Plant communities will differ across the MLRA because of the natural variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal; other vegetative states may be desired plant communities as long as the Range Health assessments are in the moderate and above category.

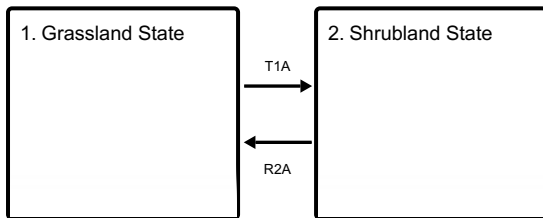
The biological processes on this site are complex. Therefore, representative values are presented in a land management context. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

Composition by dry weight and percent canopy cover are provided to describing the functional groups. Most observers find it easier to visualize or estimate percent canopy for woody species (trees and shrubs).

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

State and transition model

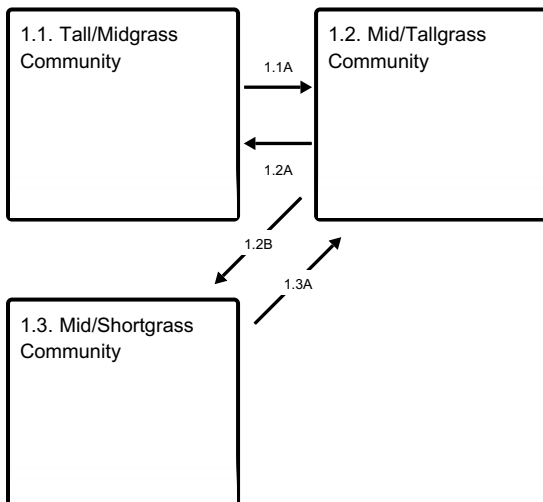
Ecosystem states



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

R2A - Reintroduction of historic disturbance regimes

State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Shrub Dominant Community

State 1 Grassland State

The Tall/Midgrass Community is dominated by little bluestem and sideoats grama. The tallgrasses such as sand bluestem and Indiangrass usually occur in crevices or in small areas of greater soil depth and where more moisture is available. A variety of shortgrasses are also present. A moderate amount of forbs are usually present and are usually well distributed. Forbs present in this community include: plains actinea, dotted gayfeather, plains blackfoot daisy, perennial wild buckwheat, and halfshrub sundrop. Shrubs make up around 5-10% of the production, but may be localized in occurrence. The major shrubs are skunkbush, yucca, broom snakeweed and feather dalea. There are not any junipers in this particular plant community but there are scattered junipers nearby. The Mid/Tallgrass Community contains little bluestem, other tallgrass species, yucca, skunkbush sumac and has approximately 10% woody canopy cover, mainly juniper. Juniper has a tendency to increase with the absence of fire provided a seed source is available. The more mesic north and northeast exposures tend to have more diversity and taller grasses and shrubs than the plants growing on the south and southwest exposures. The plant community is primarily short and midgrasses with increasing shrubs on the south exposure and midgrasses and shrubs on the north exposure. Various grasses growing in the south facing slopes include hairy grama and perennial three-awn along with smaller amounts of sideoats grama. The north facing slopes has primarily little bluestem with a stronger shrub component such as skunkbush.

Dominant plant species

- fragrant sumac (*Rhus aromatica*), shrub
- sideoats grama (*Bouteloua curtipendula*), grass
- little bluestem (*Schizachyrium scoparium*), grass

Community 1.1 Tall/Midgrass Community



Figure 8. 1.1 Tall/Midgrass Community

It is difficult to describe a definite community as the amount of actual soil material present, the degree of slope, and the exposure is variable. All these factors influence the plant community. This community is dominated by little bluestem and sideoats grama. The tallgrasses such as sand bluestem and Indiangrass usually occur in crevices or in small areas of greater soil depth and where more moisture is available. A variety of shortgrasses are also present. A moderate amount of forbs are usually present and are usually well distributed. Forbs present in this community include: plains actinea, dotted gayfeather, plains blackfoot daisy, perennial wild buckwheat, and halfshrub sundrop. Shrubs make up around 5-10% of the production, but may be localized in occurrence. The major

shrubs are skunkbush, yucca, broom snakeweed and feather dalea. There are not any junipers in this particular plant community but there are scattered junipers nearby. This community is very stable and shifts little from year to year. This site has been subjected to at least one natural fire in the last 20 years. The production is very good for this site. This community is common in the Oklahoma panhandle and northern Texas panhandle along the drainages of Coldwater Creek, Palo Duro Creek, the Beaver River, Wolf Creek and the rougher terrain along the South Canadian.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	577	801	1104
Forb	73	106	135
Shrub/Vine	45	67	78
Tree	17	22	34
Microbiotic Crusts	11	17	17
Total	723	1013	1368

Figure 10. Plant community growth curve (percent production by month). TX3996, Warm Season Native Grasses. Historic climax plant community having mid and tall warm season grasses dominating the site along with scattered forbs and trees..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	4	7	18	22	18	9	12	5	2	1

Community 1.2 Mid/Tallgrass Community



Figure 11. 1.2 Mid/Tallgrass Community

This site contains little bluestem, other tallgrass species, yucca, skunkbush sumac and has approximately 10% woody canopy cover, mainly juniper. Juniper has a tendency to increase with the absence of fire provided a seed source is available.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	448	673	835
Tree	56	84	135
Forb	45	67	101
Shrub/Vine	34	39	50
Microbiotic Crusts	–	6	6
Total	583	869	1127

Figure 13. Plant community growth curve (percent production by month). TX1744, Mid and tallgrasses with forbs/trees. Mid and tall grasses with forbs and trees..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	5	20	25	17	8	15	4	1	1

Community 1.3 Mid/Shortgrass Community



Figure 14. 1.3 Mid/Shortgrass Community

South and southwest exposures differ from north and northeast exposures in the plant communities that develop. The more mesic north and northeast exposures tend to have more diversity and taller grasses and shrubs than the plants growing on the south and southwest exposures. The plant community is primarily short and midgrasses with increasing shrubs on the south exposure and midgrasses and shrubs on the north exposure. Various grasses growing in the south facing slopes include hairy grama and perennial three-awn along with smaller amounts of sideoats grama. The north facing slopes has primarily little bluestem with a stronger shrub component such as skunkbush. The primary reason for the vegetative changes besides slopes and aspect is differences in exposure to sunlight and protection from dry southwest winds.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	504	644	729
Forb	56	84	101
Tree	22	45	67
Shrub/Vine	22	45	67
Microbiotic Crusts	–	11	17
Moss	–	–	1
Lichen	–	–	1
Total	604	829	983

Figure 16. Plant community growth curve (percent production by month). TX1519, Mid/Tallgrasses with Shrubs. "Native, Sandhills, Midgrasses and Tallgrasses with shrubs."

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	9	12	24	18	14	4	5	4	3	0

Pathway 1.1A Community 1.1 to 1.2



Tall/Midgrass Community

Mid/Tallgrass Community

With no fires and no brush management, the Tall/Midgrass Community will shift to the Mid/Tallgrass Community.

Pathway 1.2A Community 1.2 to 1.1



Mid/Tallgrass Community

Tall/Midgrass Community

With the implementation of Prescribed Burning and Brush Management conservation practices, the Mid/Tallgrass Community can shift back to the Tall/Midgrass Community.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Pathway 1.2B Community 1.2 to 1.3



Mid/Tallgrass Community



Mid/Shortgrass Community

With the continuation of no fires and no brush management, the Mid/Tallgrass Community will shift to the Mid/Shortgrass Community.

Pathway 1.3A Community 1.3 to 1.2



Mid/Shortgrass Community



Mid/Tallgrass Community

With the implementation of Prescribed Burning and Brush Management Conservation Practices, the Mid/Shortgrass Community will shift back to the Mid/Tallgrass Community.

Conservation practices

Brush Management
Prescribed Burning

State 2 Shrubland State

This Shrubland State for the Rough Breaks ecological site is now approaching the threshold of a shrub and tree dominant site. It is shrub/tree dominant with some mid and shortgrasses, yucca, and skunkbush sumac. There are fewer forbs in this plant community. It is, however, approaching 20+% woody canopy cover. The common juniper is one-seeded juniper (*Juniperus monosperma*).

Dominant plant species

- skunkbush sumac (*Rhus trilobata*), shrub
- juniper (*Juniperus*), shrub
- little bluestem (*Schizachyrium scoparium*), grass

Community 2.1 Shrub Dominant Community



Figure 17. 2.1 Shrub Dominant Community

This plant community for Rough Breaks ecological site is now approaching the threshold of a shrub and tree dominant site. It is shrub/tree dominant with some mid and shortgrasses, yucca, and skunkbush sumac. There are fewer forbs in this plant community. It is, however, approaching 20+% woody canopy cover. The common juniper is one-seeded juniper (*Juniperus monosperma*).

Table 9. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	336	476	560
Shrub/Vine	140	157	179
Forb	84	112	140
Microbiotic Crusts	–	11	17
Total	560	756	896

Figure 19. Plant community growth curve (percent production by month). TX1517, Midgrass/Shrub Community. "Degraded site, lower production of midgrasses and increase of shrubs."

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	10	26	23	11	8	8	6	3	1

Transition T1A State 1 to 2

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

Restoration pathway R2A State 2 to 1

With the implementation of Prescribed Burning, Prescribed Grazing, and Brush Management, the Shrubland State can be restored back to the Grassland State.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Additional community tables

Table 10. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Midgrasses			404–538	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	0–269	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–269	–
2	Mid/shortgrasses			303–426	
	Wright's threeawn	ARPUW	<i>Aristida purpurea var. wrightii</i>	0–106	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–106	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	0–106	–

	silver beardgrass	BOLAT	<i>Bothriochloa laguroides</i> ssp. <i>torreyana</i>	0–106	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	0–106	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–106	–
	slim tridens	TRMUE	<i>Tridens muticus</i> var. <i>elongatus</i>	0–106	–
3	Tallgrasses			84–112	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	0–56	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	0–56	–
Forb					
4	Forbs			84–135	
	Forb, annual	2FA	<i>Forb, annual</i>	0–34	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–34	–
	yellow sundrops	CASE12	<i>Calylophus serrulatus</i>	0–34	–
	rose heath	CHER2	<i>Chaetopappa ericoides</i>	0–34	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	0–34	–
	tall buckwheat	ERTEP	<i>Eriogonum tenellum</i> var. <i>platyphyllum</i>	0–34	–
	shaggy dwarf morning-glory	EVNU	<i>Evolvulus nuttallianus</i>	0–34	–
	stiffleaf false goldenaster	HEST3	<i>Heterotheca stenophylla</i>	0–34	–
	collegeflower	HYFL	<i>Hymenopappus flavescens</i>	0–34	–
	trailing krameria	KRLA	<i>Krameria lanceolata</i>	0–34	–
	Gordon's bladderpod	LEGO	<i>Lesquerella gordonii</i>	0–34	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	0–34	–
	hoary blackfoot	MECI	<i>Melampodium cinereum</i>	0–34	–
	plains blackfoot	MELE2	<i>Melampodium leucanthum</i>	0–34	–
	grassland blazingstar	MEST3	<i>Mentzelia strictissima</i>	0–34	–
	evening primrose	OENOT	<i>Oenothera</i>	0–34	–
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0–34	–
	yellow nailwort	PAVI4	<i>Paronychia virginica</i>	0–34	–
	Fendler's penstemon	PEFE	<i>Penstemon fendleri</i>	0–34	–
	James' holdback	POJA5	<i>Pomaria jamesii</i>	0–34	–
	curlytop knotweed	POLA4	<i>Polygonum lapathifolium</i>	0–34	–
	slimflower scurfpea	PSTE5	<i>Psoralidium tenuiflorum</i>	0–34	–
	diamondflowers	STNIN	<i>Stenaria nigricans</i> var. <i>nigricans</i>	0–34	–
	stemmy four-nerve daisy	TESC2	<i>Tetraneuris scaposa</i>	0–34	–
	branched noseburn	TRRA5	<i>Tragia ramosa</i>	0–34	–
Shrub/Vine					
5	Shrubs/Vines			34–67	
	alderleaf mountain mahogany	CEMO2	<i>Cercocarpus montanus</i>	0–17	–
	featherplume	DAFO	<i>Dalea formosa</i>	0–17	–
	jointfir	EPHED	<i>Ephedra</i>	0–17	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–17	–
	Nuttall's sensitive-briar	MINU6	<i>Mimosa nuttallii</i>	0–17	–
	twistedwing nightshade	OPMA2	<i>Opuntia missouriensis</i>	0–17	–

	twistspine pricklypear	OPMAZ	<i>Opuntia macromiza</i>	0-17	-
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	0-17	-
	yucca	YUCCA	<i>Yucca</i>	0-17	-
Tree					
6	Trees			22-45	
	hackberry	CELT	<i>Celtis</i>	0-22	-
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	0-22	-

Animal community

The site is used by both mule deer and white tailed deer for cover and browsing. The canyons offer protection from weather and good bedding places. Small mammals and predators also frequent the site. Golden eagles and large hawks often build nests in the clefts of the escarpments. Many species of songbirds utilize the site, especially if a juniper community is present. Cattle graze the more accessible parts of the site seasonally and with less frequency than associated sites.

Hydrological functions

Runoff is rapid from this site due to little infiltration and steep slopes. Runoff soon reaches the drainages below.

Recreational uses

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

Wood products

Junipers grow in sufficient amount in some locations to be a source for fenceposts.

Other products

At some locations, caliche is mined and used for road base. These are open pit mines and are usually fairly small. Once mined, these areas are difficult to revegetate.

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.

NRCS FOTG – Section II - Range Site Descriptions
 NRCS – NRI 417 data
 NRCS Clipping Data summaries over a 20 year period

Other references

Other references: (List other references used in the description or correlation of this site.)
 J.R. Bell, RMS, NRCS, Amarillo, Texas (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)
 Texas A&M Exp. Station, College Station, Texas

Technical Review:

Mark Moseley, State RMS, NRCS, Stillwater, Oklahoma
Homer Sanchez, State RMS, NRCS, Temple, Texas
Tony Garcia, Zone RMS, NRCS, Lubbock, Texas
Clint Rollins, RMS, NRCS, Amarillo, Texas
Dr. Jack Eckroat, Grazing Lands Specialist, NRCS, Stillwater, Oklahoma
Justin Clary, RMS, NRCS, Temple, Texas

Contributors

J.R. Bell, RMS, NRCS, Amarillo, Texas (retired)
Rollins, RMS, NRCS, Amarillo, TX
Steven McGowen, MLRA Office Leader, NRCS, Woodward, OK

Approval

Bryan Christensen, 9/12/2023

Acknowledgments

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

Rangeland health reference sheet

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

Author(s)/participant(s)	Stan Bradbury, Zone RMS, NRCS, Lubbock, Texas
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:** Due to the percent slopes, rills will be common.

2. **Presence of water flow patterns:** Due to the percent slopes, water flow patterns will be common.

3. **Number and height of erosional pedestals or terracettes:** Due to the percent slopes, pedestals/terraces will be common.
-
4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 25-35% bare ground.
-
5. **Number of gullies and erosion associated with gullies:** Due to percent slopes, gullies will be common.
-
6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight to moderate.
-
7. **Amount of litter movement (describe size and distance expected to travel):** Slight to moderate.
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Not very resistant to surface erosion.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Very gravelly loam; friable; low SOM.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Lack of vegetative cover and slope increases erosion potential. This site is a moderately permeable soil, rapid runoff and available water holding capacity is low.
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.
-
12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant: Warm-season midgrasses > Warm-season tallgrasses >>
- Sub-dominant: Warm-season shortgrasses > Forbs > Shrubs/Vines >
- Other: Trees
- 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):** 650 to 1200 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:** Juniper can become invasive.

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