USDA Natural Resources Conservation Service

# Ecological site R077CY037TX
# Very Shallow 16-21" PZ

Last updated: 9/11/2023
Accessed: 05/19/2024

## 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.

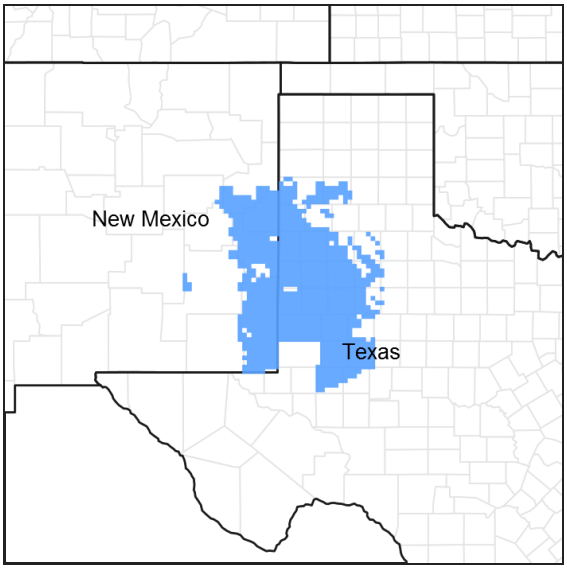



**Figure 1. Mapped extent**

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): 077C–Southern High Plains, Southern Part

MLRA 77C is characterized by nearly level plains with numerous playa depressions, moderately sloping breaks along drainageways, and a steep escarpment along the eastern margin. From southwest to northeast, soils grade from coarse-textured to fine-textured. Soils are generally deep and occur in a thermic soil temperature regime and ustic soil moisture regime bordering on aridic. Current land use is dominantly cropland.

## Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA Ag Handbook 296.

## Ecological site concept

This site occurs on shallow soils on uplands. The reference vegetation includes mid and shortgrasses, forbs, and very few shrubs. Abusive grazing practices may lead to a decrease in palatable species and a shift in the plant community. Without fire or other brush management, woody species may increase.

## Associated sites

| | |
|---|---|
| R077CY023TX | **Draw 16-21" PZ**<br>Draw sites are on nearly level to very gently sloping floodplains and drainageways below the Very Shallow site. These very deep soils are adjacent to Very Shallow sites that are on higher landscape positions. The Draw sites collect runoff moisture from surrounding plains. Midgrasses and shortgrasses dominate these sites but have some tallgrasses as well. |
| R077CY036TX | **Sandy Loam 16-21" PZ**<br>Sandy Loam sites are on nearly level to gently sloping plains. These moderately to very deep sites are adjacent to the Very Shallow site that's on similar or slightly lower landscape positions. Midgrasses and shortgrasses dominate on these sites. |
| R077CY022TX | **Deep Hardland 16-21" PZ**<br>Deep Hardland sites are on nearly level to gently sloping plains. These moderately to very deep sites are adjacent to the Very Shallow site that's on similar or slightly lower landscape positions. Shortgrasses and Midgrasses dominate on these sites. |

## Similar sites

| | |
|---|---|
| R077AY013TX | **Very Shallow 16-22" PZ**<br>This shallow site is on uplands and has calcareous, gravelly soils and soils that are shallow to a petrocalcic horizon. The reference plant community consists of midgrasses, shortgrasses and forbs. Overall production is limited due to the shallow depth of the soils. |
| R077DY049TX | **Very Shallow 12-17" PZ**<br>This shallow site is on uplands and has calcareous, gravelly soils and soils that are shallow to a petrocalcic horizon. The reference plant community consists of midgrasses, shortgrasses and forbs. Mean annual precipitation is lower (15 to 17 inches) and this site is less productive than the Very Shallow site in MLRA 77C. |
| R077EY068TX | **Very Shallow 16-24" PZ**<br>This shallow site is on uplands and has calcareous, gravelly soils and soils that are shallow to a petrocalcic horizon. The reference plant community consists of midgrasses, shortgrasses and forbs. Overall production is limited due to the shallow depth of the soils. |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Rhus trilobata*<br>(2) *Dalea formosa* |
| Herbaceous | (1) *Schizachyrium scoparium*<br>(2) *Bouteloua curtipendula* |

## Physiographic features

This site is on upland sites. It occurs on nearly level plains to steep slopes on escarpments, along relict drainageways, and summit positions of knolls and interfluves. Soils are shallow to moderately deep with caliche fragments throughout. The caliche beds in which the site occurs may be fairly soft or may be indurated. The site is generally located in the upper Ogallala formation and often occurs immediately above the hard caliche outcrops of the high plains escarpment; and in the erosional slopes just below.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Plateau > Plain<br>(2) Plateau > Escarpment<br>(3) Plateau > Valley side |
| Runoff class | Medium to very high |
| Flooding frequency | None |
| Ponding frequency | None |

| | |
|---|---|
| Elevation | 792–1,219 m |
| Slope | 0–45% |
| Ponding depth | 0 cm |
| Water table depth | 0 cm |
| Aspect | W, NW, N, NE, E, SE, S, SW |

## Climatic features

Climate is semi-arid dry steppe. 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. Wind speeds are highest in the spring and are generally southwesterly. Canadian and Pacific cold fronts come through the region in fall, winter and spring with predictability and temperature changes can be rapid. Most of the precipitation comes in the form of rain and during the period from May through October. Snowfall averages around 15 inches but may be as little as 8 inches or as much as 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 the 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 make their growth somewhat earlier.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (characteristic range) | 155-188 days |
| Freeze-free period (characteristic range) | 190-205 days |
| Precipitation total (characteristic range) | 483-559 mm |
| Frost-free period (actual range) | 149-196 days |
| Freeze-free period (actual range) | 185-210 days |
| Precipitation total (actual range) | 457-584 mm |
| Frost-free period (average) | 172 days |
| Freeze-free period (average) | 199 days |
| Precipitation total (average) | 508 mm |

## Climate stations used

- (1) CROSBYTON [USC00412121], Crosbyton, TX
- (2) CAMERON [USC00291332], Grady, NM
- (3) PANHANDLE [USC00416785], Panhandle, TX
- (4) BIG SPRING [USW00023041], Big Spring, TX
- (5) PORTALES [USC00297008], Portales, NM
- (6) DENVER CITY [USC00412408], Denver City, TX
- (7) SILVERTON [USC00418323], Silverton, TX
- (8) MORTON [USC00416074], Morton, TX
- (9) LAMESA 1 SSE [USC00415013], Lamesa, TX
- (10) LEVELLAND [USC00415183], Levelland, TX
- (11) HEREFORD [USC00414098], Hereford, TX
- (12) TULIA [USC00419175], Tulia, TX

## Influencing water features

Water features are not an influencing factor in this site.

## Wetland description

N/A

## Soil features

The soils on this site are very shallow, well drained, calcareous, gravelly soils. They commonly have light colored, gravelly loam surfaces over thick beds of caliche. Caliche may be soft, or petrocalcic horizons (indurated caliche) may be present. These sites are shallow to a restrictive petrocalcic horizon that is between 8 and 20 inches and are moderately permeable above a very slowly permeable layer. Available water holding capacity is very low and the inherent fertility is low. Plant growth and production is restricted by shallow depth and the presence of calcium carbonates.

Major Soil Taxonomic Units correlated to this site include: Kimberson loam and gravelly loam, Sharvana loamy fine sand and fine sandy loam, Slaughter fine sandy loam, and loam, Stohman fine sandy loam, Yellowhouse gravelly clay loam.

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Eolian deposits–metamorphic and sedimentary rock<br>(2) Lacustrine deposits–limestone and sandstone<br>(3) Residuum–limestone and shale |
| Surface texture | (1) Loamy fine sand<br>(2) Fine sandy loam<br>(3) Fine sandy loamGravelly, very gravelly loam<br>(4) Fine sandy loamGravelly, very gravelly loamGravelly, very gravelly clay loam |
| Family particle size | (1) Loamy<br>(2) Fine<br>(3) Clayey |
| Drainage class | Well drained |
| Permeability class | Very slow to moderate |
| Depth to restrictive layer | 20–102 cm |
| Soil depth | 25–102 cm |
| Surface fragment cover <=3" | 0–20% |
| Surface fragment cover >3" | 0–5% |
| Available water capacity (0-101.6cm) | 3.3–8.64 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0–80% |
| Electrical conductivity (0-101.6cm) | 0–8 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0–13 |
| Soil reaction (1:1 water) (0-101.6cm) | 6.6–9 |
| Subsurface fragment volume <=3" (0-101.6cm) | 0–70% |
| Subsurface fragment volume >3" (0-101.6cm) | 0–10% |

## Ecological dynamics

The Reference Plant Community is a mixture of grasses, forbs, and low growing shrubs. Vegetation is generally

sparse. Soil depth limits plant density. Areas of bare ground are common. The limy nature of the soil further defines the species occupying the site. The plant community is more productive where less limey conditions occur. Production is low and palatability of forage is less than sites with deeper soil resources. 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. Grasses such as hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*), New Mexico feathergrass (*Hesperostipa neomexicana*), and perennial three-awns (Aristida spp.) are also frequently present, with occasional sand bluestem (*Andropogon hallii*) and Indiangrass (*Sorghastrum nutans*). The more common shrubs are feather dalea (*Dalea formosa*), skunkbush sumac (*Rhus trilobata*), and juniper (Juniper monosperma). Broom snakeweed (*Gutierrezia sarothrae*) typically increases when grasses decline. However, broom snakeweed is a cyclic plant sensitive to fall moisture, once broom snakeweed dominates a site, it tends to be persistent. Small amounts of plains greasebush (Glossopetalon planitierum) may occur on areas along escarpment edges. Areas occur within the site where the shrubs may make up a large percent of the vegetation. Likewise, there are areas where grasses dominate. Forbs are generally fairly well dispersed throughout the entire site. This site is not a preferred grazing area for most domestic livestock. Plants growing on shallow, limy soils tend not to be as palatable as when growing on deep, fertile soil. Nutrients are tied up by the large amounts of lime present, and are not available to plants. This site is seldom as heavily grazed as associated upland sites. The site is frequently utilized by browsing species such as mule deer and the largely forb-consuming pronghorn.

Fire plays a role in the ecology of the site. The general effects of fire are to promote grasslands and suppress woody shrubs. The shallow, limy soils on this site have much more influence on the plant community than does any external ecological influence. Sparse vegetation and lower production limited the heat generated by natural fire and may have limited the degree of damage to woody plants. This site takes longer to recover from a burn than some associated sites. Overgrazing causes the taller grasses to decline and shrubby species to increase. Bare ground and runoff will be increased. It is somewhat uncommon to find this site severely degraded due to grazing abuse, but it can occur.

The site is not very susceptible to wind erosion due to coarse fragments on the surface. Water erosion can occur with poor cover. Severe degradation causes a drought-like condition and it becomes very difficult to restore the plant community close to the reference community. This site has limited production potential and it quickly loses the ability to support sufficient cover to protect the soil resource when degraded.

If abusive grazing does occur for prolonged periods of time the most palatable plants will be severely pressured. As retrogression proceeds, this site will move towards a Midgrass/Shrub Community (2.1). Tallgrasses will decline and midgrass species will increase along with a dramatic increase in the shrub component. The plant community will be less diverse than the reference. In this phase, the ecological processes have changed somewhat, but the pathway back toward the reference plant community can be initiated through prescribed grazing and prescribed burning. Limited fine fuel may prevent effective suppression of the woody plants.

If abusive grazing occurs for long periods of time, along with periodic droughts, retrogression will move towards a Shrub/Shortgrass Community (3.1). In extreme cases, shrubs such as yucca, skunkbush and juniper along with a high percentage of broom snakeweed will dominate the site. Numerous bare areas with surface rock fragments will be exposed increasing the potential for excessive soil erosion from water. This plant community is so degraded that retrogression can not be reversed without extensive energy and management inputs. At this point, a major threshold has been crossed. Restoration of the Shrub/Shortgrass plant community will be difficult due the droughty and rocky nature of the site. Prescribed grazing (3–5 consecutive years of deferment during the growing season), brush management (chemical and/or mechanical) and range planting will be necessary. At this point, prescribed burning is not an option due to the lack of fine fuel and poor continuity.

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.

PLANT COMMUNITIES AND TRANSITIONAL PATHWAYS (DIAGRAM)

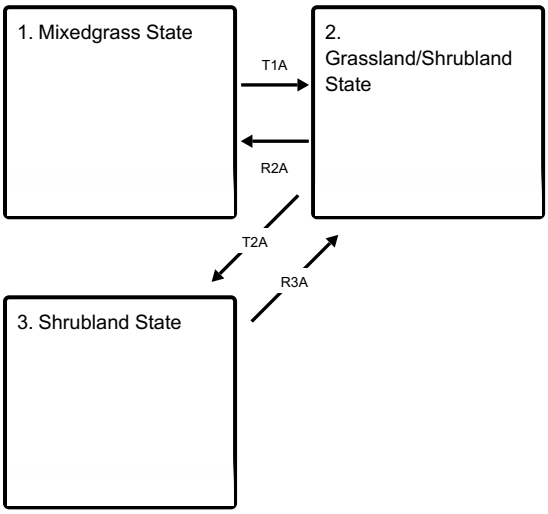
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance.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

Changes in the structure and composition of the plant community may be due to management and/or natural occurrences. At some point thresholds are crossed as indicated by the lined box on the State and Transition Diagram. This suggests that once changes have progressed to a certain point, the plant community has been altered to the extent that a return to the former state is not possible unless some form of energy is applied. These changes take place on all ecological sites. Some sites support communities that are more resistant to change than others. Also, some sites are more resilient and can heal or restore themselves more easily. Usually, changes in management practices alone, such as grazing techniques, will not be sufficient to restore former plant communities. An example of energy input might be the implementation of chemical brush management to decrease the amount of woody/cacti shrubs and increase the amount of grasses and forbs. This shift in community balance could not be brought about with grazing alone. The amount of energy required to bring about a change in plant community balance may vary a great deal depending on the present state and the desired result.

STATE AND TRANSITIONAL PATHWAYS (DIAGRAM)

## State and transition model

**Ecosystem states**




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

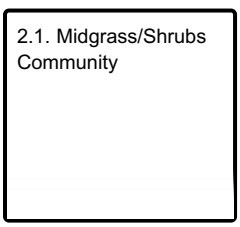
**R2A** - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

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

**R3A** - Adequate rest from defoliation and removal of woody canopy, followed by range planting

**State 1 submodel, plant communities**


**State 2 submodel, plant communities**



**State 3 submodel, plant communities**

3.1. Shrub/Shortgrass Community

## State 1
## Mixedgrass State

The Mixedgrass Community is a mixture of tall, mid, and shortgrasses. Little bluestem and sideoats grama are the most common grasses. Diverse forb community with few scattered shrubs < 10 percent exists. Some areas with surface rock fragments are common to this site.

### Dominant plant species

- little bluestem (*Schizachyrium scoparium*), grass
- sideoats grama (*Bouteloua curtipendula*), grass

## Community 1.1
## Mixed Grass Community

**Figure 8. 1.1 Mixed Grass Community**

The interpretive or "reference" plant community for this site is the Mixedgrass Plant Community. It is difficult to precisely describe this plant community, as the amount of actual soil material over parent material is variable. The depth of soil influences the species more than any other factor. The tallgrasses such as sand bluestem and Indiangrass usually occur in crevices or fissures in the rock. The site is generally dominated by little bluestem and sideoats grama with smaller amounts of shortgrasses. A moderate amount of forbs are usually present and are usually well distributed. This site can have as many as 25 different forb species. Major shrubs are feather dalea and yucca. Shrubs make up <10 percent of the production, but may be localized in occurrence. This community is very stable and shifts little from year to year. It is somewhat uncommon to find this site severely degraded due to grazing abuse, but it can occur.

**Table 5. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 639 | 908 | 1177 |
| Forb | 45 | 95 | 146 |
| Shrub/Vine | 34 | 62 | 90 |
| Microbiotic Crusts | 11 | 17 | 22 |
| Tree | – | 6 | 11 |
| **Total** | **729** | **1088** | **1446** |

**Figure 10. Plant community growth curve (percent production by month). TX1041, Mixed Grass Community. Growth is predominantly tall/mid/shortgrasses from April to October with a peak growth May through July..**

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

## State 2
## Grassland/Shrubland State

This plant community is a midgrass/shrub dominant with lesser amounts of tallgrasses. Little bluestem will be replaced with perennial three-awns. The tallgrasses found in depressions and other favorable niches on the site have been reduced and are only found in small amounts. Perennial forb diversity is still good with increasing amounts of annuals. Shrubs such as yucca, juniper, skunkbush and broom snakeweed will increase.

### Dominant plant species

- yucca (*Yucca*), shrub
- threeawn (*Aristida*), grass

## Community 2.1
## Midgrass/Shrubs Community

**Figure 11. 2.1 Midgrass/Shrubs Community**

This plant community is a midgrass/shrub dominant with lesser amounts of tallgrasses. If heavy or even moderately heavy continuous grazing does occur for prolonged periods of time the most palatable plants will be severely pressured. Little bluestem will be replaced with perennial three-awns. The tallgrasses found in depressions and other favorable niches on the site have been reduced and are only found in small amounts. Perennial forb diversity is still good with increasing amounts of annuals. Shrubs such as yucca, juniper, skunkbush, and broom snakeweed will increase. The plant community will be less diverse than the reference communtiy. In this phase, the ecological processes have changed somewhat, but the pathway back toward the reference community can be initiated through prescribed grazing, selective brush management and prescribed burning. Limited fine fuel may prevent effective

suppression of the woody plants.

**Table 6. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 493 | 695 | 897 |
| Forb | 39 | 84 | 123 |
| Shrub/Vine | 34 | 56 | 78 |
| Tree | – | – | – |
| Microbiotic Crusts | – | – | – |
| **Total** | **566** | **835** | **1098** |

**Figure 13. Plant community growth curve (percent production by month). TX1023, Midgrass Dominant Community. Growth is predominantly mid and shortgrasses from April through October with a peak growth occurring from May through July..**

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

## State 3
## Shrubland State

Broom snakeweed, perennial three-awn, low quality shortgrasses and annuals dominate. Large areas of bare ground with exposed rock fragments. Soil degradation is visible. Productivity and diversity is very low.

### Dominant plant species

- broom snakeweed (*Gutierrezia sarothrae*), shrub
- juniper (*Juniperus*), shrub
- yucca (*Yucca*), shrub

## Community 3.1
## Shrub/Shortgrass Community

**Figure 14. 3.1 Shrub/Shortgrass Community**

Depending on the topsoil depth, this site may be dominated by broom snakeweed, juniper, yucca and low quality shortgrasses. Large areas of bare ground with exposed rock fragments will be common throughout the site. Excessive soil erosion will be evident with limited topsoil in areas. This plant community is so degraded that retrogression can not be reversed without extensive energy and management inputs. At this point, a major threshold has been crossed. Restoration of the Shrub/Shortgrass Community will be difficult due the droughty and rocky nature of the site combined with the loss of valuable topsoil. Prescribed grazing (3–5 consecutive years of

deferment during the growing season), brush management (chemical and/or mechanical) and range planting will be necessary. At this point, prescribed burning is not an option due to the lack of fine fuel and poor continuity.

**Table 7. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 224 | 347 | 404 |
| Shrub/Vine | 280 | 291 | 308 |
| Forb | 31 | 39 | 45 |
| Microbiotic Crusts | – | – | – |
| Tree | – | – | – |
| **Total** | **535** | **677** | **757** |

**Figure 16. Plant community growth curve (percent production by month). TX1042, Shrub/Shortgrass Community. Growth is predominantly shrubs and shortgrasses from April through October with peak growth from May through July..**

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

## Transition T1A
## State 1 to 2

With no fires, heavy continuous grazing, and brush invasion, this plant community will transition to the Midgrass/Shrubs Community.

## Restoration pathway R2A
## State 2 to 1

With the implementation of various conservation practices such as Prescribed Grazing, Prescribed Burning, and Brush Management, the Midgrass/Shrubs Community can be shifted to the Mixed Grass Community.

**Conservation practices**

| |
|---|
| Brush Management |
| Prescribed Burning |
| Prescribed Grazing |

## Transition T2A
## State 2 to 3

With continuous heavy grazing pressure, brush invasion, no brush management, and no fires, the Midgrass/Shrubs Community will transition to the Shrub/Shortgrass Community.

## Restoration pathway R3A
## State 3 to 2

Prescribed grazing (3–5 consecutive years of deferment during the growing season), brush management (chemical and/or mechanical) and range planting will be necessary. At this point, prescribed burning is not an option due to the lack of fine fuel and poor continuity.

**Conservation practices**

| |
|---|
| Brush Management |

| |
|---|
| Prescribed Grazing |
| Range Planting |

## 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 | **Tall/Midgrasses** | | | 370–673 | |
| | sideoats grama | BOCU | *Bouteloua curtipendula* | 224–448 | – |
| | little bluestem | SCSC | *Schizachyrium scoparium* | 224–448 | – |
| 2 | **Shortgrasses** | | | 146–297 | |
| | blue grama | BOGR2 | *Bouteloua gracilis* | 56–224 | – |
| | hairy grama | BOHI2 | *Bouteloua hirsuta* | 56–168 | – |
| | sand dropseed | SPCR | *Sporobolus cryptandrus* | 56–168 | – |
| | slim tridens | TRMU | *Tridens muticus* | 56–112 | – |
| | black grama | BOER4 | *Bouteloua eriopoda* | 56–112 | – |
| 3 | **Midgrasses** | | | 62–118 | |
| | New Mexico feathergrass | HENE5 | *Hesperostipa neomexicana* | 45–112 | – |
| | Wright's threeawn | ARPUW | *Aristida purpurea var. wrightii* | 34–56 | – |
| 4 | **Tallgrasses** | | | 62–90 | |
| | sand bluestem | ANHA | *Andropogon hallii* | 62–90 | – |
| | Indiangrass | SONU2 | *Sorghastrum nutans* | 62–90 | – |
| **Forb** | | | | | |
| 5 | **Forbs** | | | 45–146 | |
| | James' holdback | POJA5 | *Pomaria jamesii* | 22–56 | – |
| | slimflower scurfpea | PSTE5 | *Psoralidium tenuiflorum* | 22–56 | – |
| | stemmy four-nerve daisy | TESC2 | *Tetraneuris scaposa* | 22–56 | – |
| | Forb, annual | 2FA | *Forb, annual* | 0–56 | – |
| | white sagebrush | ARLUM2 | *Artemisia ludoviciana ssp. mexicana* | 22–56 | – |
| | yellow sundrops | CASE12 | *Calylophus serrulatus* | 22–56 | – |
| | rose heath | CHER2 | *Chaetopappa ericoides* | 22–56 | – |
| | blacksamson echinacea | ECAN2 | *Echinacea angustifolia* | 22–56 | – |
| | longleaf buckwheat | ERLO5 | *Eriogonum longifolium* | 22–56 | – |
| | spurge | EUPHO | *Euphorbia* | 22–56 | – |
| | Chalk Hill hymenopappus | HYTE2 | *Hymenopappus tenuifolius* | 22–56 | – |
| | trailing krameria | KRLA | *Krameria lanceolata* | 22–56 | – |
| | Gordon's bladderpod | LEGO | *Lesquerella gordonii* | 22–56 | – |
| | dotted blazing star | LIPU | *Liatris punctata* | 22–56 | – |
| | hoary blackfoot | MECI | *Melampodium cinereum* | 22–56 | – |
| | plains blackfoot | MELE2 | *Melampodium leucanthum* | 22–56 | – |
| | grassland blazingstar | MEST3 | *Mentzelia strictissima* | 22–56 | – |
| | evening primrose | OENOT | *Oenothera* | 22–56 | – |

| | | | | | |
|---|---|---|---|---|---|
| | purple locoweed | OXLA3 | *Oxytropis lambertii* | 22–56 | – |
| | yellow nailwort | PAVI4 | *Paronychia virginica* | 22–56 | – |
| | Fendler's penstemon | PEFE | *Penstemon fendleri* | 22–56 | – |
| | white milkwort | POAL4 | *Polygala alba* | 11–34 | – |
| | Texas croton | CRTE4 | *Croton texensis* | 6–34 | – |
| | branched noseburn | TRRA5 | *Tragia ramosa* | 11–34 | – |
| | shaggy dwarf morning-glory | EVNU | *Evolvulus nuttallianus* | 11–22 | – |
| **Shrub/Vine** | | | | | |
| 6 | **Shrubs/Vines** | | | 34–90 | |
| | yucca | YUCCA | *Yucca* | 22–90 | – |
| | featherplume | DAFO | *Dalea formosa* | 22–56 | – |
| | jointfir | EPHED | *Ephedra* | 22–56 | – |
| | broom snakeweed | GUSA2 | *Gutierrezia sarothrae* | 22–56 | – |
| | catclaw mimosa | MIACB | *Mimosa aculeaticarpa var. biuncifera* | 22–56 | – |
| | plains pricklypear | OPPO | *Opuntia polyacantha* | 22–56 | – |
| | fragrant sumac | RHAR4 | *Rhus aromatica* | 22–56 | – |
| **Tree** | | | | | |
| 7 | **Trees** | | | 0–11 | |
| | netleaf hackberry | CELAR | *Celtis laevigata var. reticulata* | 0–11 | – |
| | oneseed juniper | JUMO | *Juniperus monosperma* | 0–11 | – |

## Animal community

Native animals that occupy this site include scaled quail, pronghorn antelope, coyote, jackrabbit, swift fox, Texas horned lizard, and mule deer. It is an open grassland site therefore species that require lots of cover may not be present. Several palatable browse species commonly occur, such as skunkbush sumac, baby white aster, mountain mahogany, and plains greasebush. It is not a preferred grazing site for most domestic livestock.

## Hydrological functions

This site often occurs above draws and along escarpments. Runoff from the site may enter major drainages.

## Recreational uses

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

## Wood products

None.

## Other products

At some locations, caliche is mined and used for road base. These are open pit mines and are usually fairly small.

## 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

## Other references

1. Archer S. 1994. Woody plant encroachment into southwestern grasslands and savannas: rates, patterns and proximate causes. In Ecological implications of livestock herbivory in the West, Ed M Vavra, W Laycock, R Pieper, pp13-68, Denver, CO: society for Range Management
2. Gould F. 1978. Common Texas Grasses: an illustrated guide. College Station, TX: Texas A & M Press.
3. Hatch, Brown and Ghandi, Vascular Plants of Texas (An Ecological Checklist)
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5. North Rolling Plains RC&D, NRCS, and GLCI. 2006 edition. Common Rangeland Plants of the Texas Panhandle.
6. Scifres CJ, Hamilton WT. 1993. Prescribed burning for brushland management: the South Texas example. College Station, TX: Texas A & M Press.
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8. USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database
9. Sosebee, Ron. Timing - the Key to Herbicidal Control of Broom Snakeweed, T-9-421, Department of Natural Resources, Texas Tech University, Lubbock, Texas.

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## Approval

Bryan Christensen, 9/11/2023

## Acknowledgments

Site Development and Testing Plan

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

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

## 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 | 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 percent slopes, rills will be common.

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

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 20-25%.

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

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None to slight.

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7. **Amount of litter movement (describe size and distance expected to travel):** None to slight.

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

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Loam; friable surface; low SOM.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Low vegetative cover and percent slopes makes this site susceptible to erosion. This site is a moderately permeable soil, runoff is medium, and available water holding capacity is very low.

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

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

    Dominant: Warm-season midgrasses > Warm-season tallgrasses >

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

    Other: Shrubs/Vines > Forbs > Trees

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Grasses due to their growth habit will exhibit some mortality and decadence though minimal.

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

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 500 to 900 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:** Yucca, Juniper and Broom snakeweed are potential invasive species for this site.

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

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