

## Ecological site R078BY084TX Rough Breaks 19-26" PZ

Last updated: 9/15/2023  
Accessed: 04/19/2024

### 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.

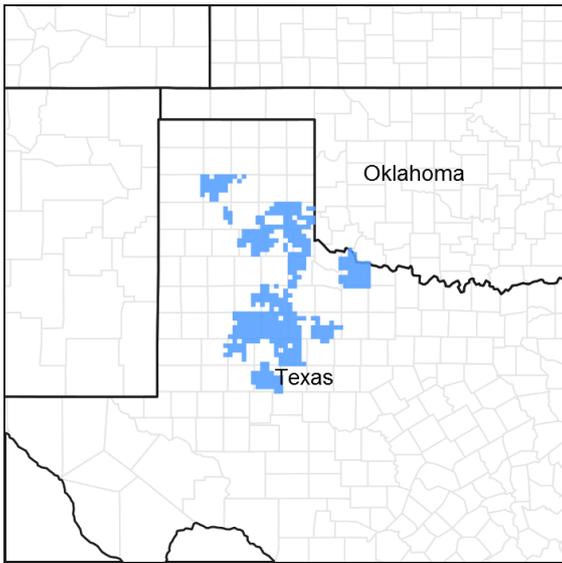


Figure 1. Mapped extent

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): 078B–Central Rolling Red Plains, Western Part

MLRA 78B is characterized by strongly dissected, rolling plains with prominent ridges and valleys and rolling to steep irregular topography. Loamy soils are generally well drained, range from shallow to deep, and developed in sediments of Triassic and Permian age.

### LRU notes

NA

### 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

These sites occur on shallow soils on steep slopes and escarpments. The reference vegetation is mid and shortgrasses with forbs and scattered woody species. These site are often protected from most fires and don't

experience heavy grazing due to slope. However, in some instances these ecological drivers still play an important roll.

### Associated sites

R078BY075TX	<b>Gravelly 20-24" PZ</b> The Gravelly site is located near the base of the Rough Breaks site. Occurs as small hills and rolling slopes.
R078BY076TX	<b>Gyp 19-26" PZ</b> Generally Gyp sites occurs as small pockets within very shallow sites near the top edge of the Rough Breaks site.
R078BY090TX	<b>Shallow Clay 19-26" PZ</b> May be found on the upland area or near the base of the Rough Breaks site.
R078BY091TX	<b>Very Shallow 19-26" PZ</b> Located along the upper edge of the Rough Breaks rim. Narrow shallow bands of soils.

**Table 1. Dominant plant species**

Tree	(1) <i>Juniperus pinchotii</i>
Shrub	(1) <i>Dalea formosa</i>
Herbaceous	(1) <i>Schizachyrium scoparium</i>

### Physiographic features

This site occurs on rough broken terrain including the escarpments and scarp slopes along the caprock separating the high plains from the rolling plains, and in rough river breaks in the rolling plains. Slopes are steep and soil development is limited. Runoff is rapid due to slope and infiltration minimal. Accessibility to livestock is generally limited and grazing pressure is usually light. Vegetative production is low to moderate due to limited moisture regime. South and west exposures usually have less vegetative production than do the north and east facing exposures.

**Table 2. Representative physiographic features**

Landforms	(1) Breaks > Escarpment (2) Breaks > Scarp (3) Breaks > Scarp slope
Runoff class	Very high
Flooding frequency	None
Ponding frequency	None
Elevation	1,000–3,000 ft
Slope	8–60%
Water table depth	60–80 in
Aspect	Aspect is not a significant factor

### Climatic features

The climate of the western rolling plains is dry, sub-humid with hot summers and mild winters. Temperatures often reach 100 degrees F for several consecutive days during summer. Cold spells with temperatures less than 20 degrees F only last short periods of time. The soil is not frozen below the 3-inch depth for more than 2 to 3 days. Humidity is low during the winter and early spring months. Sometimes relative humidity is high enough to make summer days seem uncomfortable. Most of the precipitation comes in the form of rain and that in the spring and early summer principally. May is the wettest month followed by June. July and August are dryer and much hotter. Rainfall often comes as intense showers of relatively short duration. Rainfall rate per hour is often high and runoff is significant. Infiltration is diminished due to lack of opportunity time. The growing season begins in April and ends

with the first killing frost in November. There is little snowfall with the average being about 10 inches. Rainfall averages about 22 inches.

There is a 70% chance that yearly precipitation will fall between 16 and 24 inches. About 55% of the time, the yearly rainfall is below the mean. Dry spells during the growing season are common and long-term droughts occur in cycles of about 20 years. Native vegetation is principally warm season.

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	189-194 days
Freeze-free period (characteristic range)	204-222 days
Precipitation total (characteristic range)	23-24 in
Frost-free period (actual range)	184-201 days
Freeze-free period (actual range)	202-223 days
Precipitation total (actual range)	22-25 in
Frost-free period (average)	192 days
Freeze-free period (average)	213 days
Precipitation total (average)	23 in

### Climate stations used

- (1) WELLINGTON [USC00419565], Wellington, TX
- (2) PADUCAH [USC00416740], Paducah, TX
- (3) JAYTON [USC00414570], Jayton, TX
- (4) SNYDER [USC00418433], Snyder, TX
- (5) ROBERT LEE [USC00417669], Robert Lee, TX

### Influencing water features

Rapid runoff from steep slopes can cause considerable erosion, especially where plant cover is sparse. Runoff is picked up by streams and drainages and has influence downstream.

### Wetland description

NA

### Soil features

The soils of this site are shallow, steeply sloping and often rocky or gravelly. Textures range from clay loams to sandy loams. Slopes range from 8 to 60 %. Fertility is generally low and water holding capacity limited. Infiltration is limited and runoff rapid. Soil development is limited due to slope and moisture regime. The site occurs along the break between the high and rolling plains and along escarpments formed by major drainages. It also is found on the slopes of erosional remnants, steep side slopes and knolls.

Major Soil Taxonomic Units correlated to this site include: Rough broken land, Burson – Quinlan complex, Burson soils.

**Table 4. Representative soil features**

Parent material	(1) Residuum–sandstone and siltstone
Surface texture	(1) Clay loam (2) Sandy loam
Family particle size	(1) Loamy

Drainage class	Well drained
Permeability class	Slow to moderately rapid
Depth to restrictive layer	4–20 in
Soil depth	3–20 in
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0–2%
Available water capacity (0-40in)	1.6–6.3 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–4%

## Ecological dynamics

The plant community for this site is quite variable depending on aspect and location. The reference plant community includes woody shrubs, small trees, perennial and annual forbs and tall, mid and shortgrass species. Diversity is actually quite high compared to many other sites. Production is low because of slope and moisture regime. Density is generally low and bare ground fairly high. The site is important from an aesthetic point of view and also from a wildlife habitat standpoint. Many species of plants found on the site do not usually occur elsewhere. The rough terrain has a limiting effect on grazing accessibility. The draws and canyons associated with the site offer protection from the wind and cold for wildlife and livestock. Runoff from the site contributes to the flow of many streams which originate in the area. The different exposures of the site vary in both productive capacity and species composition. More mesic exposures (north and east) generally produce more woody shrubs and more tall grass species than do the dryer (south and west) exposures. In general, the site is not heavily grazed or browsed although certain species of browse can show considerable use in areas of greater deer populations.

Redberry juniper (*Juniperus pinchotti*) has most certainly increased on a majority of the rough breaks sites in the rolling plains since settlement times. This has not been the result of overgrazing for the most part. Lack of fire no doubt has played a part in shrub increase as periodic fire can suppress juniper although very little redberry juniper is actually killed by fires. The ecology of woody shrubs in this former grassland region is not fully understood. Long term droughts followed by wet conditions lasting several days may be a climatic episode needed for maximum germination and survival of seedling of juniper as well as some other woody species. Finding a plant community that would typify the natural community at time of settlement is very difficult. Other woody plants that have shown increase include Mohr's oak (*Quercus mohriana*), in some locations, and mesquite (*Prosopis glandulosa*).

The more common grasses found on the Rough Breaks ecological site include: little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*) Canada wildrye (*Elymus canadensis*), hairy grama (*Bouteloua hirsuta*), blue grama (*Bouteloua gracilis*) black grama (*Bouteloua eriopoda*), slim tridens (*Tridens muticus*), sand dropseed (*Sporobolus cryptandrus*) and wright threeawn (*Aristida wrightii*).

Major forbs include: halfshrub sundrop (*Calylophus serrulatus*), longleaf buckwheat (*Eriogonum longifolium*), plains blackfoot (*Melampodium leucanthum*), dotted gayfeather (*Liatris punctata*), primroses (*Oenothera* spp.), baby white aster (*Leucelene ericoides*), ratany (*Krameria lanceolata*), plains actinea (*Tetranneurus scaposa*), broom nailwort (*Paronychia jamesii*), and Mexican sagewort (*Artemisia ludoviciana*).

The more frequently found woody shrubs include: feather dalea (*Dalea formosa*), skunkbush sumac (*Rhus trilobata*), elbowbush (*Forestiera pubescens*), Mohr's oak, plains greasewood (*Forsyellia planitierum*), littleleaf sumac (*Rhus microphylla*), catclaw mimosa (*Mimosa nuttallii*), hoptree (*Ptelea trifoliata*), mimosa (*Mimosa biuncifera*), prickly pear (*Opuntia polyantha*), broom snakeweed (*Gutierrezia sarothrae*), and occasionally winterfat (*Ceratoides lanata*) and mountain mahogany (*Cercocarpus montanus*). Some mesquite is found on the dryer slopes. Trees include: hackberry (*Celtis reticulata*), redberry juniper and occasional one-seeded juniper (*Juniperus monosperma*).

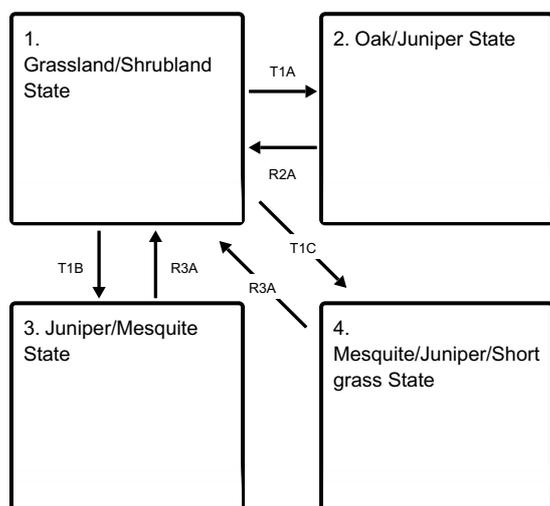
Early day settlers depended on this site as a source of wood for fence posts and for firewood. Often times, dugouts were constructed using the side of a steep slope. The value of protection from the elements was much on the minds of early day pioneers and they tended to settle where some rough terrain protected their homes.

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.

## State and transition model

### Ecosystem states



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

**T1B** - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

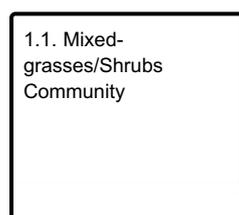
**T1C** - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

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

**R3A** - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

**R3A** - Adequate rest from defoliation and removal of woody canopy, followed by reintroduction of historic disturbance regimes

### State 1 submodel, plant communities



### State 2 submodel, plant communities

2.1. Oak/Juniper  
Community

### State 3 submodel, plant communities

3.1. Juniper/Mesquite  
Community

### State 4 submodel, plant communities

4.1.  
Mesquite/Juniper/Short  
grasses Community

## State 1

### Grassland/Shrubland State

The Mixed-grasses/Shrubs Community is a mixture of woody shrubs, small trees, forbs and grasses which typifies this site. The major grasses are sideoats grama and little bluestem. Woody plants include juniper, skunkbush sumac, elbowbush, and scattered mesquite. A good variety of perennial forbs is present. Grasses and forbs make up more of the total production than do the woody shrubs on this particular site.

#### Dominant plant species

- featherplume (*Dalea formosa*), shrub
- little bluestem (*Schizachyrium scoparium*), grass

### Community 1.1

#### Mixed-grasses/Shrubs Community



Figure 8. 1.1 Mixed-grasses/Shrubs Community

The interpretive or "reference" plant community for this site is a mixture of woody shrubs, small trees, forbs and grasses which typifies this site. The major grasses are sideoats grama and little bluestem. Woody plants include

juniper, skunkbush sumac, elbowbush, and scattered mesquite. A good variety of perennial forbs is present. Grasses and forbs make up more of the total production than do the woody shrubs on this particular site.

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

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	400	550	650
Tree	150	150	175
Shrub/Vine	60	100	150
Forb	80	100	120
Microbiotic Crusts	20	25	25
<b>Total</b>	<b>710</b>	<b>925</b>	<b>1120</b>

**Figure 10. Plant community growth curve (percent production by month). TX2019, Tall/Midgrass prairie with trees, shrubs and forbs. Tall and midgrasses with trees, small shrubs and forbs in near historic climax..**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	5	10	25	25	10	5	8	5	2	1

## State 2 Oak/Juniper State

The Oak/Juniper State is a shrub dominant with oaks and junipers dominating the site. There are some mid and tallgrasses present. The calcareous soils influence the species composition.

### Dominant plant species

- oak (*Quercus*), tree
- juniper (*Juniperus*), tree
- sideoats grama (*Bouteloua curtipendula*), grass

## Community 2.1 Oak/Juniper Community



**Figure 11. 2.1 Oak/Juniper Community**

The Oak/Juniper Community is composed of primarily Mohr's oak and redberry juniper along with a few remnants of tall and midgrasses present. There is a decreased grass/forb production from the Grassland/Shrubland State. The highly calcareous soils, aspect, and lack of fire generated the greatest affect on the plant community.

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

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	400	500	600
Grass/Grasslike	200	350	400
Forb	75	90	100
Tree	50	70	90
Microbiotic Crusts	20	20	20
<b>Total</b>	<b>745</b>	<b>1030</b>	<b>1210</b>

Figure 13. Plant community growth curve (percent production by month). TX2023, Oak / Juniper Community. Oaks and junipers with few perennial grasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	6	16	30	16	8	5	8	4	2	1

### State 3 Juniper/Mesquite State

The Juniper/Mesquite State has seen a dramatic increase of redberry juniper and mesquite dominating the Rough Breaks ecological site. There are still a few grass species remaining in the plant community. A few mesquite trees are present. Redberry juniper has increased over the past thirty years by at least twenty percent.

#### Dominant plant species

- juniper (*Juniperus*), tree
- mesquite (*Prosopis*), tree

### Community 3.1 Juniper/Mesquite Community



Figure 14. 3.1 Juniper/Mesquite Community

The Juniper/Mesquite Community is composed of primarily redberry juniper and mesquite which dominates the community along with a few clumps of mid and tallgrass species. There are still a few mesquite trees present. The redbed soils with gypsum strata have some influence on species composition. Redberry juniper has increased over the past thirty years by at least twenty percent.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	300	400	500
Tree	200	300	375
Forb	75	100	120
Shrub/Vine	50	75	85
Microbiotic Crusts	5	20	20
<b>Total</b>	<b>630</b>	<b>895</b>	<b>1100</b>

Figure 16. Plant community growth curve (percent production by month). TX2046, Mesquite/Juniper Woodland Community. Mesquite and Juniper dominated Woodland community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
5	5	5	10	20	10	5	5	10	10	10	5

## State 4

### Mesquite/Juniper/Shortgrass State

The Mesquite/Juniper/Shortgrasses Community is a mixed community of shrubs and grasses. This community is found primarily on a southwest facing slope. Shortgrasses and mesquite seem to be more acclimated to the hotter slopes.

#### Dominant plant species

- mesquite (*Prosopis*), tree
- juniper (*Juniperus*), tree
- grama (*Bouteloua*), grass

## Community 4.1

### Mesquite/Juniper/Shortgrasses Community



Figure 17. 4.1 Mesquite/Juniper/Shortgrasses Community

This Mesquite/Juniper/Shortgrass Community is a mixed community of shrubs and variety of grasses. This community is on a southwest facing slope. Shortgrasses and mesquite seem to be more acclimated to the hotter slopes. There is a less total vegetative production than on north or east facing slopes.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	250	350	400
Tree	200	250	300
Forb	75	90	100
Shrub/Vine	40	50	60
Microbiotic Crusts	10	10	10
<b>Total</b>	<b>575</b>	<b>750</b>	<b>870</b>

Figure 19. Plant community growth curve (percent production by month). TX2041, Woody Shrubs and Shortgrasses. Mesquite, Juniper, and shortgrasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	5	15	25	22	10	6	8	5	1	1

### Transition T1A State 1 to 2

Due to heavy continuous grazing, no fires, and no brush management, the Grassland/Shrubland State will transition into the Oak/Juniper State.

### Transition T1B State 1 to 3

Due to heavy continuous grazing, no fires, and no brush management, the Grassland/Shrubland State will transition into the Juniper/Mesquite State.

### Transition T1C State 1 to 4

Due to heavy continuous grazing, no fires, and no brush management, the Grassland/Shrubland State will transition into the Mesquite/Juniper/Shortgrass State. This is usually found on the south-southwest aspect.

### Restoration pathway R2A State 2 to 1

With the implementation of conservation practices such as Prescribed Grazing, Prescribed Burning, and Brush Management, the Oak/Juniper State can be restored back to the Grassland/Shrubland State.

#### Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

### Restoration pathway R3A State 3 to 1

With the implementation of conservation practices such as Prescribed Grazing, Prescribed Burning, and Brush Management, the Juniper/Mesquite State can be restored back to the Grassland/Shrubland State.

#### Conservation practices

Brush Management
------------------

Prescribed Burning
Prescribed Grazing

## Restoration pathway R3A State 4 to 1

With the implementation of conservation practices such as Prescribed Grazing, Prescribed Burning, and Brush Management, the Mesquite/Juniper/Shortgrass State can be restored back to the Grassland/Shrubland State.

### Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

## Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Tall/Midgrasses</b>			350	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	200	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	150	–
2	<b>Mid/Shortgrasses</b>			105	
	Wright's threeawn	ARPUW	<i>Aristida purpurea var. wrightii</i>	15	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	15	–
	slim tridens	TRMU	<i>Tridens muticus</i>	15	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	10	–
	silver beardgrass	BOLAT	<i>Bothriochloa laguroides ssp. torreyana</i>	10	–
	fall witchgrass	DICO6	<i>Digitaria cognata</i>	10	–
	large-spike bristlegrass	SEMA5	<i>Setaria macrostachya</i>	10	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	10	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	10	–
3	<b>Tallgrasses</b>			55	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	25	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	20	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	10	–
4	<b>Cool-season Grasses</b>			40	
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	20	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	20	–
<b>Forb</b>					
5	<b>Forbs</b>			100	
	stemmy four-nerve daisy	TESC2	<i>Tetraneuris scaposa</i>	10	–
	white sagebrush	ARLUM2	<i>Artemisia ludoviciana ssp. mexicana</i>	10	–
	yellow sundrops	CASE12	<i>Calylophus serrulatus</i>	10	–

	trailing krameria	KRLA	<i>Krameria lanceolata</i>	10	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	5	–
	plains blackfoot	MELE2	<i>Melampodium leucanthum</i>	5	–
	littleleaf sensitive-briar	MIMI22	<i>Mimosa microphylla</i>	5	–
	evening primrose	OENOT	<i>Oenothera</i>	5	–
	rose heath	CHER2	<i>Chaetopappa ericoides</i>	5	–
	shortray fleabane	ERLO	<i>Erigeron lonchophyllus</i>	5	–
	hoary false goldenaster	HECA8	<i>Heterotheca canescens</i>	5	–
	Rocky Mountain zinnia	ZIGR	<i>Zinnia grandiflora</i>	5	–
	slimflower scurfpea	PSTE5	<i>Psoralidium tenuiflorum</i>	5	–
	Drummond's skullcap	SCDR2	<i>Scutellaria drummondii</i>	5	–
	Forb, annual	2FA	<i>Forb, annual</i>	5	–
	Chalk Hill hymenopappus	HYTE2	<i>Hymenopappus tenuifolius</i>	0–1	–
	purple locoweed	OXLA3	<i>Oxytropis lambertii</i>	0–1	–
	James' nailwort	PAJA	<i>Paronychia jamesii</i>	0–1	–
<b>Shrub/Vine</b>					
6	<b>Shrubs/Vines</b>			100	
	fragrant sumac	RHAR4	<i>Rhus aromatica</i>	25	–
	mesquite	PROSO	<i>Prosopis</i>	15	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	10	–
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	10	–
	alderleaf mountain mahogany	CEMO2	<i>Cercocarpus montanus</i>	10	–
	featherplume	DAFO	<i>Dalea formosa</i>	10	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	5	–
	Mohr oak	QUMO	<i>Quercus mohriana</i>	5	–
	littleleaf sumac	RHMI3	<i>Rhus microphylla</i>	5	–
	soapweed yucca	YUGL	<i>Yucca glauca</i>	5	–
	common hoptree	PTTR	<i>Ptelea trifoliata</i>	0–1	–
	stretchberry	FOPU2	<i>Forestiera pubescens</i>	0–1	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–1	–
<b>Tree</b>					
7	<b>Trees</b>			120–150	
	Pinchot's juniper	JUPI	<i>Juniperus pinchotii</i>	120	–
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	20	–
	hackberry	CELTI	<i>Celtis</i>	10	–

## Animal community

Animals that use the site for habitat are Whitetail deer and Mule deer, Aoudad sheep, coyotes, raccoon, small mammals, songbirds, bobcats, raptors, lizards, various species of snakes. The site offers cover and protection from the elements, bedding areas for deer and sheep and much needed shade during summer heat. Mud swallows sometimes use the sheer cliff walls to build their nests. In certain locations there are small caves in steep walls that are attractive to bats.

## **Hydrological functions**

Contributes fast runoff to surrounding streams and drainages.

## **Recreational uses**

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

## **Wood products**

At times, juniper has been used for posts.

## **Other products**

None.

## **Other information**

Early native Americans frequented these sites utilizing the woody plants for tools and for shelter.

## **Inventory data references**

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

Inventory Data References (documents):

NRCS FOTG – Section II - Range Site Descriptions

NRCS Clipping Data summaries over a 20 year period

## **Other references**

J.R. Bell , USDA-NRCS Rangeland Management Specialist (retired)

Natural Resources Conservation Service - Range Site Descriptions

USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database

Rathjen, Frederick W., The Texas Panhandle Frontier, Rev. 1998, Univ. of Texas Press

Hatch, Brown and Ghandi, Vascular Plants of Texas (An Ecological Checklist)

Texas A&M Exp. Station, College Station, Texas

Texas Tech University – Range, Wildlife & Fisheries Dept.

## **Contributors**

J.R. Bell

PES Edits by Tyson Morley, MLRA Soil Scientist, Altus, Oklahoma

## **Approval**

Bryan Christensen, 9/15/2023

## **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% mineral soil.

---

5. **Number of gullies and erosion associated with gullies:** Due to the 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 the 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 >
- Sub-dominant: Warm-season tallgrasses > Shrubs/Vines >
- Other: Warm-season shortgrasses > Cool-season grasses > Forbs > Trees
- Additional:
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant mortality and decadence is 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):** 750 to 1,200 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 be 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.
-