Ecological site R078BY071TX
Clay Flat 19-26" PZ

Last updated: 9/15/2023
Accessed: 04/17/2024

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.

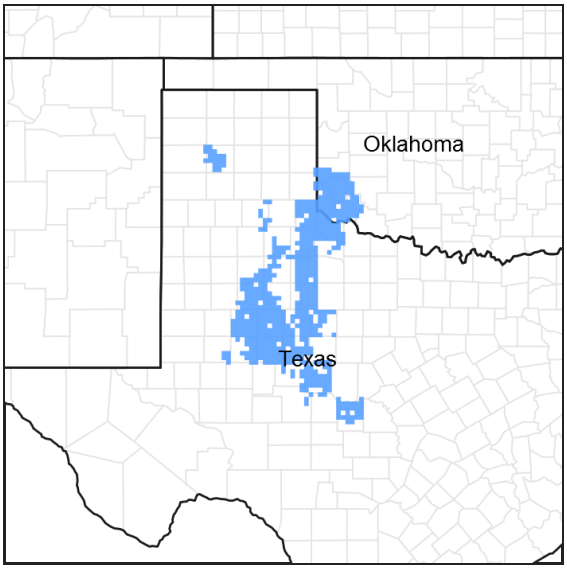


Figure 1. Mapped extent

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 deep soils high in montmorillonite clays. The soils have a high shrink-swell potential with gigai often present. The reference vegetation consists of midgrasses and shortgrasses with few forbs and very few

shrubs. Due to the clay content, these soils can be sensitive to drought conditions. Abusive grazing practices may lead to a shift in the plant community.

Associated sites

R078BY072TX	**Clay Loam 19-26" PZ** Deep clay loam soils on uplands.
R078BY084TX	**Rough Breaks 19-26" PZ** Shallow soils on breaks.
R078BY090TX	**Shallow Clay 19-26" PZ** Shallow clay soils on uplands.
R078BY091TX	**Very Shallow 19-26" PZ** Very shallow loams and clays on uplands.

Similar sites

R078CY095TX	**Clay Flat 23-30" PZ** Clay Flat site in 78C

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pleuraphis mutica* (2) *Sporobolus airoides*

Physiographic features

This site occurs as broad, alluvial plains or filled valleys. The slopes are 0 to 5%.

Table 2. Representative physiographic features

Landforms	(1) Plains > Alluvial fan (2) Plains > Alluvial flat (3) Plains > Valley flat
Runoff class	Negligible to very high
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	Rare
Elevation	1,250–3,000 ft
Slope	0–5%
Ponding depth	2–8 in
Water table depth	60–200 in
Aspect	Aspect is not a significant factor

Climatic features

The climate is semi-arid to dry sub-humid. The growing season is approximately 220 days. First frost occurs approx. Nov. 3 and last frost approx. Apr. 1. Sixty-six percent of the yearly rainfall occurs between May and September. 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

This site may receive some extra runoff from higher elevations. Runoff from the site is slow due to slope. Water moves into the soil rapidly when soils are dry and very slowly when soils are wet. The gilgai microrelief causes some slight ponding after heavy rainfall events. This does not last for very long. Some siltation can occur on areas where the vegetative cover is poor.

Wetland description

NA

Soil features

The soils of the clay flat site are deep, reddish colored clays that are high in montmorillonite. They have high shrink-swell potential and they often exhibit gilgai microrelief. Wide, deep cracks are evident when soils are dry. The soils are extremely sticky when wet. They have a high water holding capacity but release water to plants sparingly. The movement of the soils due to shrinking and swelling has some effect on plant roots systems. They are slight to moderately alkaline and moderately fertile. Erosion is not a major problem due to nearly level terrain. These soils take water in rapidly when dry and cracked, but take water very slowly if already wet. Taxonomically they are classified as Fine, smectitic, thermic, chromic Haplotorrerts.

Soil series that are typical for this site include: Dalby clay and Stamford clay.

Table 4. Representative soil features

Parent material	(1) Alluvium–clayey shale
Surface texture	(1) Clay
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Very slow
Soil depth	28–80 in
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0–1%
Available water capacity (0-40in)	5–7 in
Calcium carbonate equivalent (0-40in)	0–15%
Electrical conductivity (0-40in)	2–16 mmhos/cm
Sodium adsorption ratio (0-40in)	0–30
Soil reaction (1:1 water) (0-40in)	7.4–8.8
Subsurface fragment volume <=3" (Depth not specified)	0–1%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

The reference plant community is limited most by the nature of the soils occurring on the site. The high shrink/swell clays plus a relatively dry climate limit the species to those that can tolerate those harsh conditions. In general, the reference plant community can be best described as a Tobosa – Alkali sacaton (*Pleuraphis mutica* - *Sporobolus airoides*) community with a limited amount of other grass species, a limited forb population and a somewhat scattered shrub component. Old photographs of this site taken in the early 1900's show that the mesquite and other shrubs tended toward open stands of moderate sized plants and there were some fairly large areas with no brush species present. Other grass species that occur in smaller amounts on the Clay Flat ecological site are: blue grama (*Bouteloua gracilis*), buffalograss (*Bouteloua dactyloides*), white tridens (*Tridens albescens*), vine mesquite (*Panicum obtusum*), whorled dropseed (*Sporobolus pyramidatus*), sand dropseed (*Sporobolus cryptandrus*), and occasionally a small amount of Texas wintergrass (*Nassella leucotricha*). The shrubs common to the site are mesquite (*Prosopis glandulosa*), lotebush (*Ziziphus obtusifolia*), wolfberry (*Symphoricarpos orbiculatus*), cholla (*Cylindropuntia imbricata*), tasajillo (*Cylindropuntia leptocaulis*), prickly pear (Opuntia spp.), ephedra (Ephedra spp.), and occasionally four-wing saltbush (*Atriplex canescens*) and shadscale saltbush (*Atriplex confertifolia*). In reference condition, it is thought that shrubs tended to be more scattered with mesquite more likely to be confined to water courses or on small areas of more loamy soils that sometimes occur within the broader clay flat areas. Present day examination shows that mesquite has increased more than any other woody species on the site. Mesquite is generally smaller in size than the plants growing on associated sites. They tend to be four to six feet in height and very much multi-stemmed.

Tobosa has always been the dominant grass species on this site but with grazing pressure it has become more so. Alkali sacaton may be somewhat diminished in many places due to it being preferred over the tobosa during most of the year. Blue grama and buffalograss are usually grazed very heavily. Vine mesquite is also a highly preferred species on the site. No doubt these more palatable species have declined over time due to selective grazing. Tobosa accounts for the majority of the production on the site. Tobosa is uniquely adapted to heavy clay soils because of its tough, scaly, deep root system. There is always some old growth present, thereby protecting itself from over utilization. The accumulation of litter is important on the site because of the droughty nature of the soil and the need to conserve moisture and limit evaporation. Tobosa and alkali sacaton seem to be able to withstand

moderate to heavy grazing pressure with minimal ill effects. The warm-season grasses found on the site are C-4 type metabolism plants and the cool-season grasses are C-3 plants. All the shrubs are C-3 with the possible exception of Atriplex. Forbs are a combination of C-3 and C-4 plants. The resistance of the site to change is high. Resilience is also high provided the site has not been denuded of cover. The productivity of the site is rather high when well managed. If abused for long periods of time, this site, like most others will certainly manifest major changes in species composition and productivity or both. Lack of fire and heavy grazing are the major factors effecting change. Long-term droughts can act in combination with poor management to compound the negative effect on plant communities.

Fire played a very important role in the ecology of the clay flat site. Tobosa responds very well to fire and needs fire to restore vigor and eliminate old litter buildup that can occur over several years. When burned, tobosa increases greatly in palatability to large herbivores. Opening up the thick cover of tobosa allowed an increase of forbs for a year or two and allowed seed to be made. Alkali sacaton also responds well to fire and will usually increase somewhat under a fire ecology. Vine mesquite is also very fire responsive. Animals were drawn to the site after a burn which probably allowed some of the more preferred sites to rest naturally. Fire contributed to a greater diversity of plants and was important to the maintenance of a vigorous grassland community on this site. Prescribed fire is a recognized tool in managing the plant community on this site and is being used with some success. It has been found through research and experience that the optimum frequency with which to burn upland tobosa communities is about 7 to 8 years, depending somewhat on the growing seasons between fires. Fire is probably going to be necessary in managing this site for optimum livestock grazing or for wildlife use if those are the objectives.

Hydrologically speaking, the site has little runoff and therefore does not have the potential to affect watersheds as much as sites with more slope. However, if good protective cover is not maintained on the site, some sediment can find its way downstream. Silting in of small ponds within the site has always been a problem. If the cover is ever lost on this site, the clayey surface forms a thick hard crust that sheds water and increases evaporation.

Revegetation of this site is very difficult to accomplish because of soil characteristics. The brushy species, namely mesquite, are very hard to control with herbicides on this site. Mechanical control such as grubbing or root plowing destroys a lot of the perennial grass cover and more often than not, annuals such as annual broomweed (*Amphiachyris dracunculoides*) prevail for two or three years, even with reseeding. Eventually, the plants most adapted to the site will return and again become dominant.

The animal community that uses the site for habitat includes white-tailed deer, bob-white quail and small mammals. Most of these sites have sufficient woody shrubs to provide cover for deer, and quail utilize the area as nesting cover and for loafing areas where the grass cover is not too thick. Forb diversity and palatable browse is not sufficient to provide a reliable food source over the long term. Some of the associated sites supply better habitat elements than does the clay flat.

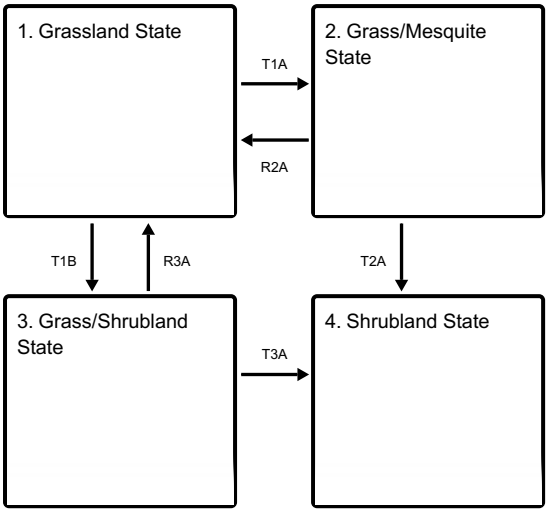
State & Transition Diagram Narrative:
The following diagram suggests some pathways that the vegetation on this site might take in response to various management treatment or natural stimuli over time. There may be other states that could result that are not shown in the diagram. Those shown are some of the states most commonly observed. Local guidance should be sought when making plans to manipulate plant communities for specific purposes.

As a site changes in the structure and makeup of the plant community, the changes may be due to management or due to natural occurrences or both. Changes may occur slowly or fairly rapidly depending on the type of events occurring. At some point in time thresholds are crossed. This means that once changes in vegetation have progressed to some certain point, the balance of the community has been altered to the extent that a return to the former vegetative state is generally not possible, that is, not possible without some form of energy being applied in order to make the plant community respond in that direction. These changes in plant communities occur on all ecological sites with some sites being more resistant to change than others. Also, some sites seem to be more resilient, being more easily restored. Usually, changes in management practices alone, such as improved grazing methods, will not result in major changes to the community. An example of energy input that might be required to effect change might be the implementation of chemical brush management and complete growing season rest to reduce domination of woody shrubs and shift the community to one of more perennial grasses and forbs. This action might have to be done more than once and might take several years. Such a vegetative shift could surely not be accomplished by a change in grazing management alone. The amount of energy required to effect change

would depend on the present vegetative state and the desired state.

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

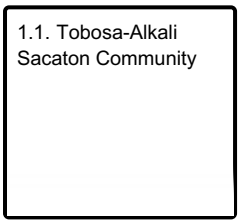
R2A - Adequate rest from defoliation coupled with brush management. Reintroduction of historic disturbance regimes, may be coupled with rangeland seeding

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

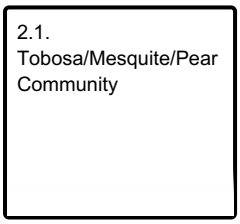
R3A - Adequate rest from defoliation coupled with brush management. Reintroduction of historic disturbance regimes, may be coupled with rangeland seeding

T3A - Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

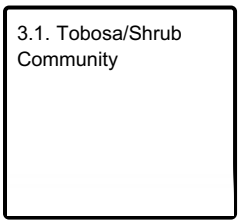
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities

4.1. Mesquite/Annuals Community

State 1
Grassland State

In the Grassland State, tobosa dominates the community with alkali sacaton being secondary in occurrence. Small amounts of blue grama and buffalograss occur throughout. Annual production is normal for the site. Few forbs are present due to the dry early summer at this location. Mesquite is scattered and is shorter than 6 feet in height and is multi-stemmed.

Dominant plant species

- tobosagrass (*Pleuraphis mutica*), grass
- alkali sacaton (*Sporobolus airoides*), grass

Community 1.1
Tobosa-Alkali Sacaton Community

Figure 8. 1.1 Tobosa-Alkali Sacaton Community with encroaching Mesquite

This plant community is the reference plant community. Tobosa dominates the community with alkali sacaton being secondary in occurrence. Small amounts of blue grama and buffalograss occur throughout. Annual production is normal for the site. Few forbs are present due to the dry early summer at this location. Mesquite is scattered and shorter than 6 feet in height and is multi-stemmed.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1650	2600	3000
Forb	80	140	220
Shrub/Vine	100	150	200
Total	**1830**	**2890**	**3420**

Figure 10. Plant community growth curve (percent production by month). TX2027, Tobosa/alkali sacaton/mesquite community. Tobosa-alkali sacaton/mesquite.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	6	24	25	13	8	12	5	2	1

State 2
Grass/Mesquite State

The Grass/Mesquite State has tobosa as the dominant grass with an increase in the canopy and production of mesquite. Mesquite is 4 to 6 feet in height and is multi-stemmed. Prickly pear is also increasing.

Dominant plant species

- mesquite (*Prosopis*), shrub
- tobosagrass (*Pleuraphis mutica*), grass

Community 2.1
Tobosa/Mesquite/Pear Community

Figure 11. 2.1 Tobosa/Mesquite/Pear Community

This community has tobosa as the dominant grass with an increase in the canopy and production of mesquite. Mesquite is 4 to 6 feet in height and is multi-stemmed. Prickly pear is also increasing. The production is somewhat less than historic climax.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1250	1750	2250
Forb	300	420	550
Shrub/Vine	175	225	275
Microbiotic Crusts	15	20	20
Total	**1740**	**2415**	**3095**

Figure 13. Plant community growth curve (percent production by month). TX2028, Tobosa/Mesquite/Prickly Pear. Tobosa with increasing mesquite and prickly pear..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	6	25	25	12	8	13	6	1	0

State 3
Grass/Shrubland State

The Grass/Shrubland State shows more mixed shrubs, namely more mesquite and prickly pear. The grass production is less. The major grass species is tobosa. Alkali sacaton has decreased along with the small amounts of other perennial grasses.

Dominant plant species

- mesquite (*Prosopis*), shrub
- pricklypear (*Opuntia*), shrub
- tobosagrass (*Pleuraphis mutica*), grass

Community 3.1
Tobosa/Shrub Community

Figure 14. 3.1 Tobosa/Shrub Community

The Grass/Shrubland State shows more mixed shrubs, namely more mesquite and prickly pear. The grass production is less. The major grass species is tobosa. Alkali sacaton has decreased along with the small amounts of other perennial grasses.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1600	2050	2475
Shrub/Vine	220	280	330
Forb	50	75	120
Total	**1870**	**2405**	**2925**

Figure 16. Plant community growth curve (percent production by month). TX2028, Tobosa/Mesquite/Prickly Pear. Tobosa with increasing mesquite and prickly pear..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	6	25	25	12	8	13	6	1	0

State 4
Shrubland State

This community is a severely degraded community. This community is mesquite dominant with little perennial grass remaining. Annuals will be strong when moisture occurs and cool-season annual grasses and forbs will make up a large part of the next season’s production. This may not be a stable state, but annuals will likely prevail for several years. There may be sufficient seed source to allow perennial warm-season grasses to reclaim the area in time.

Dominant plant species

- mesquite (*Prosopis*), shrub
- lotebush (*Ziziphus obtusifolia*), shrub
- pricklypear (*Opuntia*), shrub

Community 4.1
Mesquite/Annuals Community

Figure 17. 4.1 Mesquite/Annuals Community

This community is a severely degraded community. This community is mesquite dominant with little perennial grass remaining. This is due to long-term abusive grazing coupled with long-term droughts. Annuals will be strong when moisture occurs and cool-season annual grasses and forbs will make up a large part of the next season's production. This may not be a stable state, but annuals will likely prevail for several years. There may be sufficient seed source to allow perennial warm-season grasses to reclaim the area in time. This state can occur but usually it does not reach this stage of degradation. If this state is reached, drastic measures such as mechanical brush removal and reseeding. Success in revegetating this site has been limited.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Forb	400	700	800
Grass/Grasslike	200	300	500
Shrub/Vine	250	300	350
Total	**850**	**1300**	**1650**

Figure 19. Plant community growth curve (percent production by month). TX2029, Mesquite/Shrubs/Annual grasses/Annual forbs. Mesquite with cool season annual grasses and forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	6	12	27	20	10	3	1	6	8	3	3

Transition T1A
State 1 to 2

With heavy continuous grazing, no fires, and brush invasion over a thirty plus year period, the Grassland State will transition into the Grass/Mesquite State.

Transition T1B
State 1 to 3

With heavy continuous grazing, no fires, and brush invasion over a thirty plus year period, the Grassland State will transition into the Grass/Shrubland State.

Restoration pathway R2A
State 2 to 1

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

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Transition T2A
State 2 to 4

Due to heavy continuous grazing, no fires, brush invasion, and drought conditions, the Grass/Mesquite State will transition into the Shrubland State.

Restoration pathway R3A
State 3 to 1

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

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Transition T3A
State 3 to 4

Due to heavy continuous grazing, no fires, brush invasion, and drought conditions, the Grass/Shrubland State will transition into the Shrubland State.

Constraints to recovery. Absence of disturbance and natural regeneration over time, may be coupled with excessive grazing pressure

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
0	**Midgrasses**			2215–2800	
1	**Mid/shortgrasses**			175–300	
	buffalograss	BODA2	*Bouteloua dactyloides*	50–200	–
	blue grama	BOGR2	*Bouteloua gracilis*	50–200	–
2	**Midgrasses**			175–250	
	Hall's panicgrass	PAHA	*Panicum hallii*	25–75	–
	vine mesquite	PAOB	*Panicum obtusum*	25–75	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	25–75	–
	Madagascar dropseed	SPPY2	*Sporobolus pyramidatus*	25–75	–
	white tridens	TRAL2	*Tridens albescens*	25–75	–
3	**Grasses**			75–125	
	little barley	HOPU	*Hordeum pusillum*	25–75	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	25–75	–
Forb					
4	**Forbs**			100–150	
	Texas croton	CRTE4	*Croton texensis*	0–25	–
	snow on the mountain	EUMA8	*Euphorbia marginata*	0–25	–
	scarlet beeblossom	GACO5	*Gaura coccinea*	0–25	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–25	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	0–25	–
	pony beebalm	MOPE	*Monarda pectinata*	0–25	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–25	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0–25	–
	Baldwin's ironweed	VEBA	*Vernonia baldwinii*	0–25	–
Shrub/Vine					
5	**Shrubs/Vines**			150–210	
	honey mesquite	PRGL2	*Prosopis glandulosa*	0–100	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0–50	–
	fourwing saltbush	ATCA2	*Atriplex canescens*	0–50	–
	shadscale saltbush	ATCO	*Atriplex confertifolia*	0–50	–
	tree cholla	CYIMI	*Cylindropuntia imbricata var. imbricata*	0–50	–
	candle cholla	CYKL	*Cylindropuntia kleiniae*	0–50	–
	Torrey's jointfir	EPTO	*Ephedra torreyana*	0–50	–
	Berlandier's wolfberry	LYBE	*Lycium berlandieri*	0–50	–
	pricklypear	OPUNT	*Opuntia*	0–50	–
Tree					
6	**Trees**			0–1	
	hackberry	CELTI	*Celtis*	0–1	–

Animal community

The animal community consists of grassland birds, quail, white-tailed deer, various small mammals and predators. This site is not the most preferred site due to little diversity in plant community and lack of forbs and browse plants. Feral hogs like to use the site to root up prickly pear.

Hydrological functions

The site contributes small amounts of runoff. The soils produce significant amounts of silt if the cover is poor. Small ponds and water courses can be affected by silt downstream. Good perennial grass cover is essential for proper hydrologic function and
nutrient cycling.

Recreational uses

This site has limited recreational value. Hunting would be the main recreational activity.

Wood products

No wood products are produced on the site.

Other products

None.

Other information

None.

Inventory data references

The information in this document is based on observations of range sites over many years, knowledge of where well managed rangeland were located, and from the review of available data such as NRCS range clippings (417s), old range inventories on ranches, and from the review of previously developed range site information. Historical accounts were reviewed where possible.

Soil Survey Reports for counties in the 78B MLRA, NRCS Field Office Technical Guides, Soil Series Official Descriptions, Ecological Checklist of the Vascular Plants of Texas (Tx. A&M Exp. Stat. publ.), Gould's Grasses of Texas, NRCS Texas Plant List.

And personal discussions with rangeland authorities like Dr. Ronald Sosebee, Dept. of Range, Wildlife and Fisheries, Texas Tech University, Lubbock, Tx

Other references

J.R. Bell, RMS, NRCS, Amarillo, Texas (retired)
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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.

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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.

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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:** None to slight.

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2. **Presence of water flow patterns:** None to slight.

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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% bare ground.

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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):** Very resistant to surface erosion.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface 0-9 inches thick; reddish brown clay; weak very fine and fine angular blocky structure; extremely hard; very firm; common fine and very fine roots, moderately alkaline.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Extensive basal cover, density with small interspaces should make rainfall impact minimal. This site has very slowly permeable soils, runoff is slow and available water holding capacity is high and wind erosion is 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 >>

    Sub-dominant: Warm-season shortgrasses > Shrubs/Vines > Cool-season grasses > Forbs >

    Other: Trees

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant community will always have some mortality and decadence.

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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):** 1,850 to 3,500 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:** Mesquite, Lotebush, Pricklypear and Tasajillo 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.