USDA Natural Resources
Conservation Service

Ecological site R080BY607TX
Clayey Upland 26-33" PZ

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

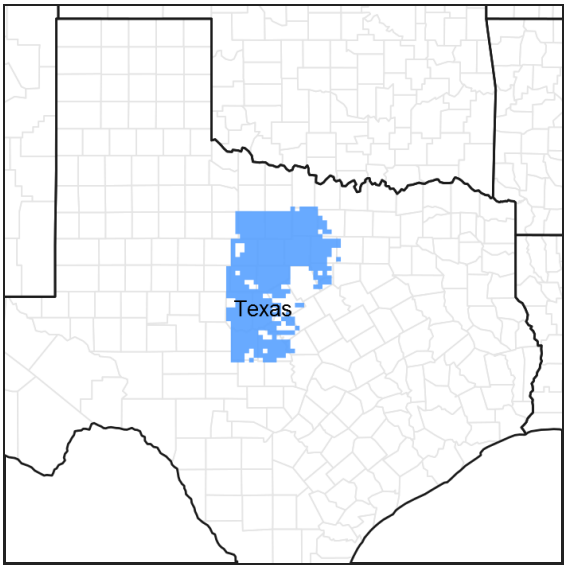


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

MLRA notes

Major Land Resource Area (MLRA): 080B–Texas North-Central Prairies

MLRA 80B consists of gently rolling, dissected plains with very steep hillsides and sideslopes and narrow flood plains associated with small streams. Loamy and clayey soils range from very shallow to deep and developed in sandstones, shales, and limestones of Pennsylvanian age.

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 clay soils on uplands. The reference vegetation consists of native midgrasses and shortgrasses with scattered forbs and very few shrubs. These areas are prone to invasion by mesquite without periodic fire or other brush management.

Associated sites

R080BY146TX	**Clay Loam 26-33" PZ** Clayey Upland sites are most frequently found adjacent to Clay Loam sites.

Similar sites

R078CY095TX	**Clay Flat 23-30" PZ** Similar species and slightly lower production in MLRA adjacent to western counties. Tobosagrass is an indicator species on this site.
R078AY117TX	**Clayey Upland 25-28" PZ** Similar species and slightly lower production in MLRA adjacent to western counties.
R081BY324TX	**Clay Flat 23-31 PZ** Similar species and slightly lower production in MLRA adjacent to southern counties.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Bouteloua curtipendula* (2) *Nassella leucotricha*

Physiographic features

This site occurs on linear base slopes of hillslopes, valley floors, and treads of stream terraces in the Texas North-Central Prairies. Slopes are typically less than 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Hills > Hillslope (2) Hills > Ridge (3) Alluvial plain > Stream terrace
Runoff class	High to very high
Elevation	229–732 m
Slope	0–5%
Aspect	Aspect is not a significant factor

Climatic features

The climate is subtropical subhumid and is characterized by hot humid summers and relatively mild winters. Tropical maritime air controls the climate during spring, summer and fall. In winter and early spring, frequent surges of polar Canadian air cause sudden drops in temperatures and add considerable variety to the daily weather. The average first frost generally occurs about November 5 and the last freeze of the season usually occurs about March 19. The average frost free period ranges from 215 days in the northern counties, to 240 days in the south.

The average relative humidity in mid-afternoon is about 60 percent in the summer months. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 75 percent of the time possible during the summer and 50 percent in winter. The prevailing wind direction is from the southwest and highest windspeeds occur during the spring months.

Approximately 75% of annual rainfall occurs between April 1 and October 31. Rainfall during the months of April through September typically occurs during thunderstorms which tend to be intense and brief, resulting in large amounts of rain in a short time. The wettest months of the year are May, June, September, and October. The driest months during the growing season are July and August. The winter months of November, December, January, and February are the driest months overall.

Average annual precipitation for the entire MLRA is approximately 28 inches. There is a noticeable difference in the

average annual precipitation in the northern counties in comparison to the southern and western counties of this Major Land Resource Area. Jack, Clay, Young, and Palo Pinto Counties all have an average annual precipitation of more than 31 inches. Stephens, Eastland, McCulloch, and San Saba Counties all have an average annual precipitation of less than 28 inches.

Winters tend to be mild, with occasional periods of very cold temperatures which can be accompanied by strong northerly winds and freezing precipitation. Snow is infrequent and significant accumulations are rare. These periods of very cold weather are generally short-lived. Summers tend to be hot and dry. Drought conditions are common during most summers. Air temperatures of more than 95oF are common from mid-June through September. In the northern counties nearest to the Red River, temperatures are generally slightly cooler during winter months and slightly warmer during summer months than in the other counties in the North Central Prairie.

Table 3. Representative climatic features

Frost-free period (characteristic range)	184-200 days
Freeze-free period (characteristic range)	211-225 days
Precipitation total (characteristic range)	762-813 mm
Frost-free period (actual range)	183-204 days
Freeze-free period (actual range)	210-226 days
Precipitation total (actual range)	737-838 mm
Frost-free period (average)	193 days
Freeze-free period (average)	217 days
Precipitation total (average)	787 mm

Climate stations used

- (1) SAN SABA 7NW [USC00417994], Richland Springs, TX
- (2) BROWNWOOD 2ENE [USC00411138], Early, TX
- (3) EASTLAND [USC00412715], Eastland, TX
- (4) MINERAL WELLS AP [USW00093985], Millsap, TX
- (5) BRECKENRIDGE [USC00411042], Breckenridge, TX
- (6) GRAHAM [USC00413668], Graham, TX
- (7) JACKSBORO [USC00414517], Jacksboro, TX

Influencing water features

The areas are prone to shedding rainwater via runoff to adjacent sites. However, the presence of good ground cover and deep rooted grasses can help facilitate water infiltration into the soil. These sites are not associated with wetlands.

Wetland description

NA

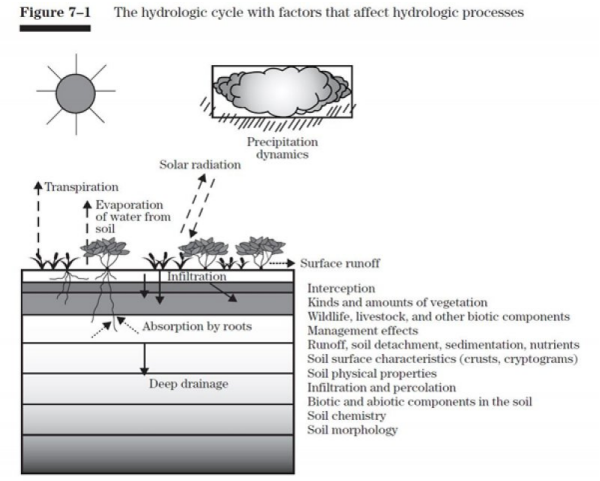


Figure 8.

Soil features

The Clayey Upland ecological site consists of deep, well drained soils. Permeability is very slow. Runoff is low on slopes less than 1 percent, moderate on 1 to 3 percent slopes and high on 3 to 5 percent slopes. The soil develops wide cracks during dry conditions, but seals over quickly and becomes extremely sticky and plastic when wet. Water enters the soil rapidly when it is dry and cracked, and very slowly when it is moist. Runoff is negligible when soil is cracked and dry, and rapid when soil is moist and sealed over.

Gilgai micro-relief is characteristic of the Clayey Upland site. Gilgai refers to numerous shallow depressions and low mounds running parallel to the slope and randomly scattered throughout the site. The heavy clay soil has a high shrink-swell capacity. During extended wet periods, the soil expands and becomes spongy and boggy. Livestock, humans, and vehicles have difficulty traversing the site. They tend to bog down and leave depressions in the soil surface. As the soil dries out it contracts, leaving numerous cracks on the soil surface. Depressions caused by livestock, humans, or vehicles remain, leaving the dry soil surface uneven in many places. The soil is highly susceptible to compaction caused by heavy foot traffic or vehicle traffic.

The major soil series is Leeray.

Table 4. Representative soil features

Parent material	(1) Alluvium–claystone (2) Slope alluvium–claystone (3) Alluvium–limestone (4) Slope alluvium–limestone
Surface texture	(1) Clay
Drainage class	Well drained
Permeability class	Very slow
Soil depth	152 cm
Surface fragment cover <=3"	0–2%
Surface fragment cover >3"	0–2%
Available water capacity (0-101.6cm)	17.78–22.86 cm
Calcium carbonate equivalent (0-101.6cm)	0–35%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–15

Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4
Subsurface fragment volume <=3" (0-101.6cm)	0–5%
Subsurface fragment volume >3" (0-101.6cm)	0–3%

Ecological dynamics

The reference plant community for the Clayey Upland ecological site is a midgrass/shortgrass prairie. Evidence of the historic vegetation can be found in the journals and records of explorers, military expeditions, boundary survey teams, and early scientists who studied the vegetation.

Gilgai microrelief is a unique and characteristic feature of this site. Western wheatgrass, vine mesquite, and other similar grasses are found in the scattered shallow depressions. Warm-season midgrasses are dominant in the interspaces as well as on the sides and tops of low mounds.

Climate is a major factor influencing vegetation on the site. The soils are deep, but rooting depth of herbaceous vegetation is restricted because of the density of the heavy clay soil. As a result, plants on this site are among the earliest to show signs of distress in the early stages of drought. Even short-term dry periods have a negative impact on this site compared to associated sites. The Clayey Upland ecological site can be useful as an indicator to begin preparations for implementation of the first stage of drought plans. Because of the boggy nature of the heavy clay soil, livestock grazing and vehicle traffic often have to be restricted during extended wet periods.

Long-term droughts lasting multiple years or growing seasons are infrequent, but when they do occur, they can have a negative impact on the vegetation. If abusive grazing occurs during or immediately following the drought period, the results can be devastating. The effects of erratic seasonal moisture and short-term dry spells lasting a few months are not as severe as those caused by long-term droughts. However, the lower the ecological status of the site, the greater the negative impact will be during drought periods regardless of duration.

Fire was an important part of the ecosystem. Historic fires on this site were not as intense as they were on most associated sites because of the structure of the vegetation, and the relatively low amount of fine fuel to sustain the fires. The shorter height of the grasses and the scarcity of forbs and woody plants contributed to these less intense fires. However, fires of moderate to low intensity did play a key role in refreshing and reinvigorating the old growth vegetation and keeping weeds and brush suppressed. Lack of fire allows unwanted woody species and weeds to encroach from adjacent sites and become established.

Prior to settlement, this site was subject to periodic grazing and browsing by vast herds of bison, wild cattle, wild horses, and antelope. It was not a preferred site except for short periods of time during the early spring when fresh, new growth of annuals and shortgrasses appeared. At times these grazing and browsing episodes were intense and severe, but periods of heavy use were followed by long periods of non-use as the herds migrated to fresh grazing areas before returning to previously grazed areas. The grazed areas had an opportunity to rest, regrow, regain vigor, and reproduce prior to the next grazing event.

As the region was settled, fire was reduced or eliminated and grasslands were fenced off to control movement and facilitate grazing by domestic livestock. As a result of abusive grazing or lack of grazing and/or the elimination of fire, in association with extreme climatic events, the historic plant community has been altered on most Clayey Upland sites. As late- successional midgrasses decrease on the site, they are replaced by early-successional midgrasses, a significant increase in the shortgrasses, as well as annual grasses and forbs. Further deterioration leads to the loss of the perennial midgrass plant community as shortgrasses, annual forbs, and annual grasses, begin to dominate the site. If disturbances are severe enough for an extended period of time, annual species dominate and bare ground is extensive. This provides the opportunity for woody species such as mesquite, lotebush, pricklypear, tasajillo, and juniper to encroach from adjacent sites.

Selective removal of individual undesirable trees and shrubs is relatively easy and more practical when brush plants initially appear on the site. The increase of brush can be fairly rapid and the plants per acre will soon become too numerous for individual control to be feasible. Once woody plants become mature or develop into dense stands,

control is expensive, uneconomical, impractical, and difficult to achieve. Brush management is most successful using a systems approach. Initial treatment by mechanical methods can be followed by using approved herbicides, and using prescribed fire as a maintenance technique. Prescribed grazing with a reasonable stocking rate can sustain the grass species composition and production at a near reference level.

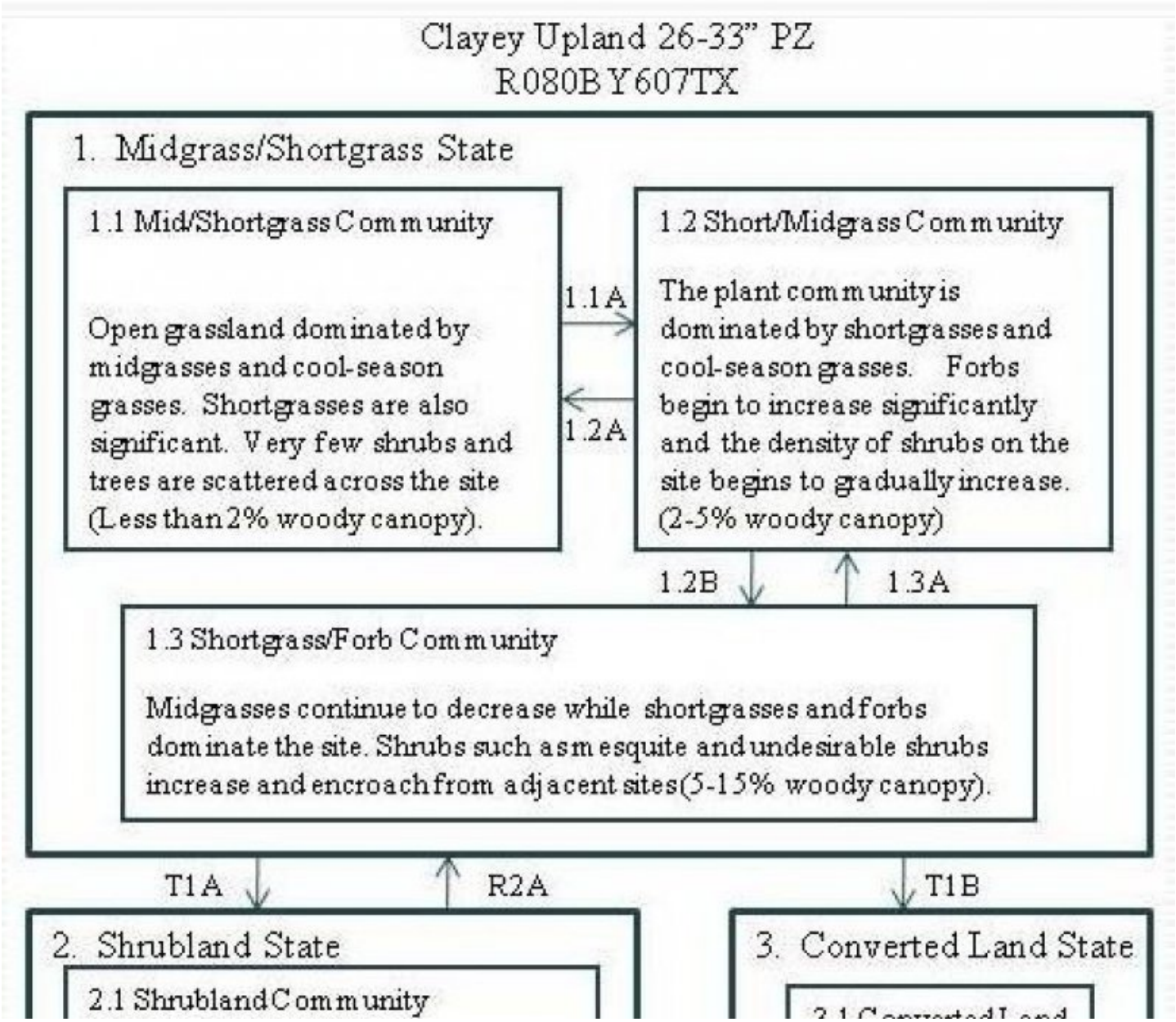
Changes in plant communities and vegetation states on the Clayey Upland site are result of the combined influences of natural events (rainfall, temperature, drought, etc.) and the accompanying management systems implemented on the area (prescribed fire, grazing management, brush management).

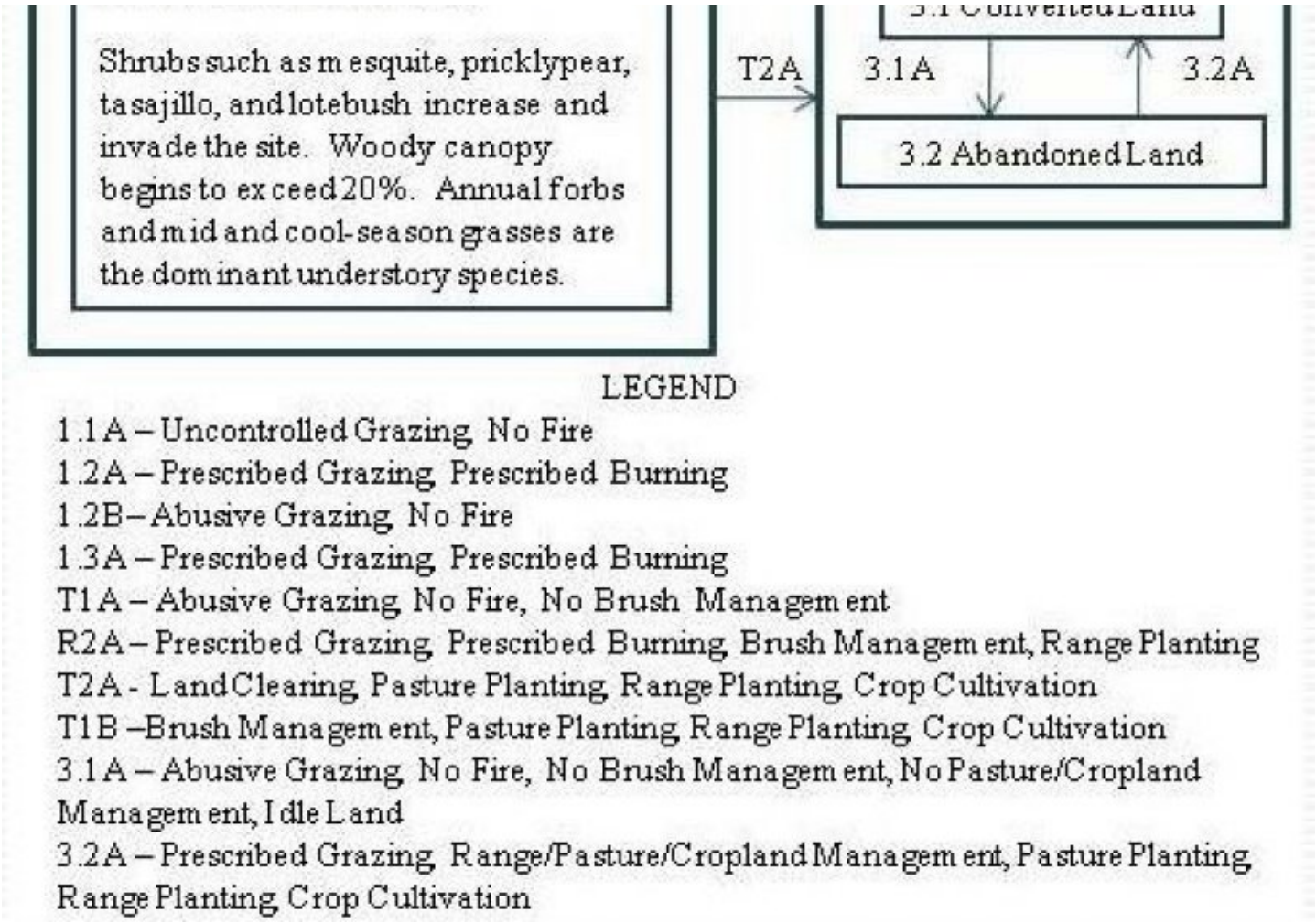
Rangeland Health Reference Worksheets have been posted for this site on the Texas NRCS website (www.tx.nrcs.usda.gov) in Section II of the eFOTG under (F) Ecological Site Descriptions.

State and Transitional Pathways:
The State and Transition Diagram which follows provides information on some of the most typical pathways that the vegetation on this site can follow as the result of natural events, management inputs, and application of conservation treatments. There may be other plant communities that can exist on this site under certain conditions. Consultation with local experts and professionals is recommended prior to application of practices or management strategies in order to ensure that specific objectives will be met.

Plant Communities and Transitional Pathways (diagram):

State and transition model





State 1
Mid/Shortgrass State - Reference

The reference plant community for the Clayey Upland ecological site is a Mid/Shortgrass Prairie Communitywith minor amounts of cool-season grasses. The site is dominated by midgrasses such as sideoats grama vine-mesquite, Arizona cottontop, and Texas wintergrass. Shortgrasses such as buffalograss and curlymesquite are significant in this plant community. Cool-season grasses such as western wheatgrass and Texas bluegrass are a minor, but important, part of the plant community. This site has relatively few perennial forbs. Shrubs and trees make up an insignificant part of the historic plant community. Scattered hackberry trees, bumelia, lotebush, and ephedra may occur. Annual production ranges from 2200 to 4200 pounds per acre. The Short/Midgrass Community (1.2) is noted by the decline of sideoats grama and vine mesquite. Shortgrasses such as buffalograss, curlymesquite, and Texas grama begin to dominate the site. Texas wintergrass becomes the dominant midgrass. More annual grasses and forbs appear on the site. Shrubs begin to invade from adjacent sites and the shrub canopy begins to gradually increase. Annual production ranges from 1800 to 3400 pounds per acre. The Shortgrass/Forb Community (1.3) is composed of shortgrasses continuing to dominate the site, and annual forbs and grasses increase dramatically. A few individual plants of midgrasses remain in isolated areas. Shrubs become well established. Annual production ranges from 1200 to 2400 pounds per acre.

Dominant plant species

- sideoats grama (*Bouteloua curtipendula*), grass

Community 1.1
Mid/Shortgrass Prairie Community

Figure 9. 1.1 Mid/Shortgrass Prairie Community

Figure 10. 1.1 Mid/Shortgrass Prairie Community (2)

The reference plant community for the Clayey Upland ecological site is a Mid/Shortgrass Prairie Community with minor amounts of cool-season grasses. The site is dominated by midgrasses such as sideoats grama vine-mesquite, Arizona cottontop, and Texas wintergrass. Other midgrasses include white tridens, meadow dropseed, and silver bluestem. Shortgrasses such as buffalograss and curlymesquite are a significant part of the plant community as well. Cool-season grasses such as western wheatgrass and Texas bluegrass are a minor, but important, part of the historic plant community. This site has relatively few perennial forbs. The most common forbs are Engelmann daisy, heath aster, catclaw sensitivebriar, greenthread, gayfeather, western ragweed, eryngo, and trailing ratany. Shrubs and trees make up an insignificant part of the plant community. Scattered hackberry trees, bumelia, lotebush, and ephedra may occur. Annual production ranges from 2200 to 4200 pounds per acre.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2354	3363	4483
Forb	112	168	196
Shrub/Vine	–	17	28
Tree	–	11	28
Total	**2466**	**3559**	**4735**

Figure 12. Plant community growth curve (percent production by month). TX3027, Mid/Shortgrass Prairie. Historic Climax Plant Community, Mid and Short grass Prairie..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	2	10	20	24	10	5	10	10	3	2

Community 1.2
Short/Midgrass Community

Figure 13. 1.2 Short/Midgrass Community

Sideoats grama and vine mesquite begin to decline because of disturbance or neglect as a result of short-term or sporadic heavy grazing, lack of fire, climatic factors, or other factors. Obvious shifts in plant species and structure of the plant community begin to occur. Shortgrasses such as buffalograss, curlymesquite, and Texas grama begin to dominate the site. Texas wintergrass becomes the dominant midgrass. Other midgrasses including silver bluestem, white tridens, tumble windmillgrass, and hairy grama begin to increase on the site. More annual grasses and forbs begin to appear on the site. Mesquite, lotebush, pricklypear, and tasajillo begin to invade from adjacent sites and the shrub canopy begins to gradually increase. Annual production ranges from 1800 to 3400 pounds per acre.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1681	2466	3250
Forb	224	308	392
Shrub/Vine	112	140	168
Total	**2017**	**2914**	**3810**

Figure 15. Plant community growth curve (percent production by month). TX3028, Shortgrass Prairie. Historic Climax Plant Community with buffalograss, Texas wintergrass, and dropseeds dominating site..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3	4	7	15	18	15	5	5	10	10	5	3

Community 1.3
Shortgrass/Forb Community

Figure 16. 1.3 Shortgrass/Forb Community

This plant community is the result of prolonged periods of damaging disturbances and neglect which may include continuous abusive grazing and total lack of prescribed fire or brush management. Shortgrasses continue to dominate the site, and annual forbs and grasses increase dramatically. A few individual plants of sideoats grama, vine mesquite, and Arizona cottontop remain in isolated areas, but Texas wintergrass, silver bluestem, and white tridens are the most common midgrasses. Mesquite, lotebush, pricklypear, and tasajillo become well established. Annual production ranges from 1200 to 2400 pounds per acre.

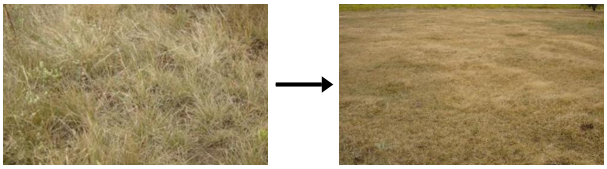
Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1009	1457	1905
Forb	224	336	448
Shrub/Vine	112	224	336
Total	**1345**	**2017**	**2689**

Figure 18. Plant community growth curve (percent production by month). TX3039, Shortgrass/Annuals/Mesquite/Shrubs Community. Shortgrass/Annuals/Mesquite and Shrubs – buffalograss, curlymesquite, broomweed, annual forbs and grasses, mesquite, lotebush.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3	4	8	16	18	12	4	4	10	12	6	3

Pathway 1.1A
Community 1.1 to 1.2



Mid/Shortgrass Prairie Community

Short/Midgrass Community

With uncontrolled grazing and no fires, the Mid/Shortgrass Community shifts to the Short/Midgrass Community.

Pathway 1.2A
Community 1.2 to 1.1

Short/Midgrass Community

Mid/Shortgrass Prairie Community

With the implementation of various conservation practices including Prescribed Grazing and Prescribed Burning, the Short/Midgrass Community can be reverted back to the Mid/Shortgrass Community.

Conservation practices

Prescribed Burning
Prescribed Grazing

Pathway 1.2B
Community 1.2 to 1.3

Short/Midgrass Community

Shortgrass/Forb Community

With abusive heavy grazing and no fires, the Short/Midgrass Community will shift to the Shortgrass/Forb Community.

Pathway 1.3A
Community 1.3 to 1.2

Shortgrass/Forb Community

Short/Midgrass Community

With Prescribed Grazing and Prescribed Burning, the Shortgrass/Forb Community can be restored back to the Short/Midgrass Community.

Conservation practices

Prescribed Burning
Prescribed Grazing

State 2
Shrubland State

In the Shrubland Community, mesquite canopy may be as high as 30 to 40%. Lotebush is found throughout the site and pricklypear and tasajillo populations increase significantly. Annual forbs such as broomweed are abundant. Herbaceous vegetation is dominated by shortgrasses. Areas of bare ground occur frequently.

Dominant plant species

- honey mesquite (*Prosopis glandulosa*), shrub
- buffalograss (*Bouteloua dactyloides*), grass

Community 2.1

Shrubland Community

Figure 19. 2.1 Shrubland Community

Herbaceous vegetation is dominated by shortgrasses as well as annual forbs and grasses. Continued lack of fire and brush management along with uncontrolled grazing results in a plant community dominated by shrubs. Mesquite canopy may be as high as 30 to 40%. Lotebush is found throughout the site and pricklypear and tasajillo populations increase significantly. Annual forbs such as broomweed are abundant. Areas of bare ground occur frequently.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	560	841	1233
Forb	280	448	560
Shrub/Vine	112	168	224
Total	**952**	**1457**	**2017**

Figure 21. Plant community growth curve (percent production by month). TX3016, Mesquite Invasion with Other Shrubs. Mesquite dominated the site. Fewer warm season grasses and increase of shrubby species..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3	3	5	9	23	19	4	5	12	10	4	3

State 3
Converted Land State

The Converted Land State is often used because of the deep soil, level terrain, and the lack of trees and shrubs. This allowed a large percentage of this site to be plowed up and converted to cropland or planted to monocultures of introduced grasses. Cropland is mostly small grains or cotton. Introduced grasses used on this site are primarily bermudagrass, Kleingrass, and K.R. bluestem.

Dominant plant species

- Bermudagrass (*Cynodon dactylon*), grass

Community 3.1
Converted Land Community

Figure 22. 3.1 Converted Land Community

Because of the deep soil, level terrain, and the lack of trees and shrubs, a large percentage of this site has been plowed up and converted to cropland or planted to monocultures of introduced grasses. Cropland is mostly small grains or cotton. Introduced grasses used on this site are primarily bermudagrass, Kleingrass, and King Ranch (K.R.) bluestem. Areas converted to cropland, pastureland, or hayland are intensively managed with annual cultivation and/or frequent use of herbicides, pesticides, and commercial fertilizers to increase production. Refer to Forage Suitability Group Descriptions to learn more about adapted species, management, and production potentials on pasturelands and haylands.

Table 9. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1905	4147	6389
Forb	224	224	224
Shrub/Vine	112	112	112
Total	**2241**	**4483**	**6725**

Figure 24. Plant community growth curve (percent production by month). TX3037, Converted Land Community. Planted to monocultures of introduced species, or monocultures or mixtures of commercially available native tallgrasses. .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	5	14	23	20	5	4	12	8	3	2

Community 3.2
Abandoned Land Community

Figure 25. 3.2 Abandoned Land Community

Abandoned croplands and reseeded areas tend to revert back to a more natural state through the process of secondary succession. This is a very slow process that takes decades or centuries dependent on the status of the area at the time it is abandoned. The first, or early pioneer plants to establish are shallow rooted annual forbs and grasses followed by early successional shortgrasses and midgrasses. Seedlings of shrubs such as mesquite will also appear. If managed properly, some of these abandoned areas may eventually begin to approximate the diversity and complexity of the native Clayey Upland ecosystem. Midgrasses and perennial forbs may begin to establish if the area is carefully managed. However, it is highly unlikely that abandoned lands can ever return to reference vegetation within a reasonable period of time.

Table 10. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Forb	448	560	673
Grass/Grasslike	336	448	560
Shrub/Vine	112	224	336
Total	**896**	**1232**	**1569**

Figure 27. Plant community growth curve (percent production by month). TX3038, Abandoned Land Community. Abandoned croplands, pasturelands and seeded areas..

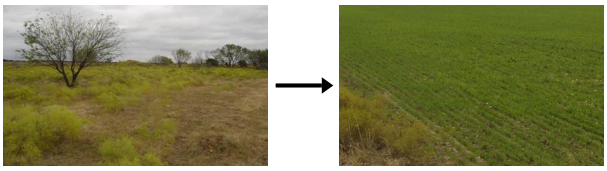
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3	4	8	16	18	12	4	4	10	12	6	3

Pathway 3.1A
Community 3.1 to 3.2

Converted Land Community **Abandoned Land Community**

With abusive grazing, no fires, no brush management, no pasture management, no cropland management, and idle/abandonment, the Converted Land Community shifts to the Abandoned Land Community.

Pathway 3.2A
Community 3.2 to 3.1



Abandoned Land Community **Converted Land Community**

With Prescribed Grazing, Pasture/Range/Cropland Management, Pasture Planting, Range Planting, and Crop Cultivation, the Abandoned Land Community can be shifted to the Converted Land Community.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing
Range Planting

Transition T1A
State 1 to 2

With abusive grazing pressure, no fires, and no brush management, the Mid/Shortgrass State transitions into the Shrubland State.

Transition T1B
State 1 to 3

With Brush Management, Pasture Planting, Range Planting, and Crop Cultivation, the Mid/Shortgrass State will transition into the Converted Land State.

Restoration pathway R2A
State 2 to 1

With the implementation of various conservation practices such as Prescribed Grazing, Prescribed Burning, Brush Management, and Range Planting, the Shrubland State can be restored to the Mid/Shortgrass State.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing
Range Planting

Transition T2A
State 2 to 3

With land clearing, Pasture Planting, Range Planting, and Crop Cultivation, the Shrubland State will transition into the Converted Land State.

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Midgrasses**			1457–2634	
	vine mesquite	PAOB	*Panicum obtusum*	0–2018	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	280–2018	–
	Texas wintergrass	NALE3	*Nassella leucotricha*	280–1345	–
2	**Midgrasses**			504–897	
	Drummond's dropseed	SPCOD3	*Sporobolus compositus var. drummondii*	56–448	–
	white tridens	TRAL2	*Tridens albescens*	22–448	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	56–448	–
	Arizona cottontop	DICA8	*Digitaria californica*	0–448	–
	Texas cupgrass	ERSE5	*Eriochloa sericea*	0–224	–
	Rio Grande bristlegrass	SERER	*Setaria reverchonii ssp. ramiseta*	0–224	–
3	**Midgrasses**			112–224	

	hooded windmill grass	CHCU2	*Chloris cucullata*	0–112	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	0–112	–
	sedge	CAREX	*Carex*	0–56	–
	tumble windmill grass	CHVE2	*Chloris verticillata*	0–56	–
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	0–56	–
4	**Shortgrasses**			224–504	
	buffalograss	BODA2	*Bouteloua dactyloides*	0–504	–
	curly-mesquite	HIBE	*Hilaria belangeri*	0–504	–
	Texas grama	BORI	*Bouteloua rigidiseta*	0–56	–
5	**Cool-season grasses**			56–168	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–168	–
	Texas bluegrass	POAR	*Poa arachnifera*	0–168	–
Forb					
6	**Forbs**			112–224	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	0–56	–
	Texas thistle	CITE2	*Cirsium texanum*	0–56	–
	Queen Anne's lace	DACA6	*Daucus carota*	0–56	–
	prairie clover	DALEA	*Dalea*	0–56	–
	Engelmann's daisy	ENPE4	*Engelmannia peristenia*	0–56	–
	Leavenworth's eryngo	ERLE11	*Eryngium leavenworthii*	0–56	–
	beeblossom	GAURA	*Gaura*	0–56	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–56	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	0–56	–
	pony beebalm	MOPE	*Monarda pectinata*	0–56	–
	woodsorrel	OXALI	*Oxalis*	0–56	–
	smartweed leaf-flower	PHPO3	*Phyllanthus polygonoides*	0–56	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–56	–
	white heath aster	SYERE	*Symphyotrichum ericoides var. ericoides*	0–56	–
	slender greenthread	THSI	*Thelesperma simplicifolium*	0–56	–
	Texas vervain	VEHA	*Verbena halei*	0–56	–
	spiny cocklebur	XASP2	*Xanthium spinosum*	0–56	–
Shrub/Vine					
7	**Shrubs/Vines**			0–28	
	gum bully	SILA20	*Sideroxylon lanuginosum*	0–28	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	0–11	–
	clapweed	EPAN	*Ephedra antisyphilitica*	0–11	–
Tree					
8	**Trees**			0–28	
	hackberry	CELTI	*Celtis*	0–28	–

Animal community

Historically, the Clayey Upland site was occasionally utilized by a variety mammals, reptiles, and birds. Several historical references and journals written in the 18th and 19th century by explorers, survey parties, and military

expeditions refer to herds of bison, wild cattle, wild horses, and antelope roaming freely across the North Central Prairie and adjacent regions.

Currently, the site is utilized intermittently by deer, quail, dove, species of grassland birds, and small fur-bearing mammals. Feral hogs are also frequent visitors to the site in some areas. This is not a preferred site for most wildlife species because of the relatively low and uniform structure of the vegetation, as well as the lack of trees, shrubs, and forbs. Wildlife tend to use this site incidentally in association with the use of more suitable adjacent sites. Animal species and populations fluctuate as the vegetation cycles through temporary phases and different ecological stages. Animals may have difficulty traversing the site when the soil is wet.

Livestock grazing should be controlled by implementing grazing management systems that incorporate frequent and timely deferment periods to prevent abusive grazing.

Hydrological functions

When the soil is cracked and dry, infiltration is rapid and runoff is limited on this site. When the soil is wet, it seals over and runoff is accelerated. A thick, healthy grass cover reduces runoff velocity and results in improved water quality because it serves as a filter or trap to reduce sediments and pollutants before the water flows offsite.

Recreational uses

Because of the scarcity of trees and shrubs, the level terrain, characteristics of the soil, and the uniformity of the plant community, recreational use of this site is incidental and is generally associated with recreational use of adjacent sites.

Wood products

Insignificant.

Other products

Insignificant.

Other information

None.

Inventory data references

Vegetation data for this site was obtained from existing Range Site Descriptions, SCS-RANGE -417 Production and Composition Records for Native Grazing Lands, and on-site inventories by the author and local experts including ranchers, natural resource specialists from federal and state agencies, and personnel from cooperating agencies and organizations. A total of 11 SCS-RANGE-417’s containing data collected from 4 counties (Brown, Shackelford, Palo Pinto and Stephens Counties) during the period 12/30/1981 to 12/12/1986 were reviewed for this site.

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Bryan Christensen, 9/19/2023

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)	Lem Creswell, Zone RMS, NRCS, Weatherford, Texas
Contact for lead author	817-596-2865
Date	10/22/2007
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None.

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

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Expect no more than 10% bare ground randomly distributed throughout.

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

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Under normal rainfall, little litter movement should be expected. However, litter may move across the site during intense storm events.

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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):** Soil surface in HCPC is resistant to erosion. Stability class range is expected to be 5-6.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** 0 to 72 inches thick with dark grayish brown clay with generally moderate fine granular and subangular blocky structure. SOM is approximately 1-6%. See soil survey for specific soil info.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Areas of dense, low growing, sod forming shortgrasses may contribute to moderately high runoff rate and reduced infiltration.

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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 > Cool-season grasses >

    Other: Forbs > Shrubs

    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 very slight.

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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):** 2200-4200 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:** Mesquite, pricklypear, tasajillo, broomweed and King Ranch bluestem.

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17. **Perennial plant reproductive capability:** All perennial plants should be capable of reproducing, except during periods of prolonged drought conditions,abusive grazing, and wildfires.
