USDA Natural Resources Conservation Service

Ecological site R070BY663TX
Clay Loam 12-18" PZ

Last updated: 9/12/2023
Accessed: 05/10/2025

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.

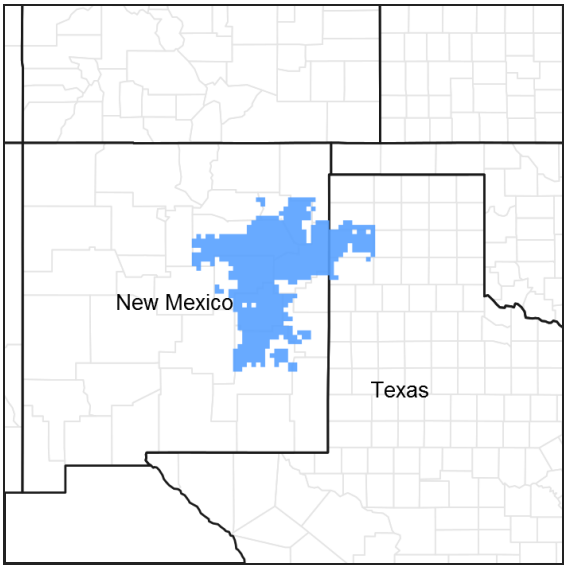

Figure 1. Mapped extent

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): 070B–Pecos and Canadian River Basins

MLRA 70B is characterized by broad, rolling piedmonts, plains, and tablelands broken by drainageways and tributaries of the Pecos River. Native vegetation is mid- to short-grass prairie species in the lowlands, with pinyon and juniper in the higher elevations and on steeper north-facing slopes. Current land use is predominantly livestock grazing. The soils formed in material weathered from sedimentary rocks of Cretaceous age.

Ecological site concept

This site occurs on deep or very deep soils with textures of clay loam or silty clay loam throughout. Common landscape positions are footslopes and upland positions adjacent to drainageways. Slopes range from 0 to 5 percent.

Associated sites

R070BY662TX	**Clayey 12-18" PZ** This site is nearly level with very heavy clay soils. It is dominated by tobosagrass. It occupies a slightly lower landscape position. Production slightly higher.

R070BY664TX	**Red Shale 12-18" PZ** This site has sparser cover. The soils are less developed. It exhibits more surface erosion. Production is significantly lower.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

The Clay Loam ecological site occurs on nearly level to gently sloping terrain on broad ridges, divides, and foot slopes below hills and escarpments. Slopes are smooth to convex and are from moderate to moderately long in length and average from 1 to 5 percent. Locally, this site may occur as narrow bands along drainages or as wide, oval areas on footslopes.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan
Flooding frequency	None
Ponding frequency	None
Elevation	3,200–4,300 ft
Slope	0–9%
Water table depth	40–60 in
Aspect	Aspect is not a significant factor

Climatic features

The climate of this area can be classified as “semi-arid continental”. Summers are hot with winters being generally mild with numerous cold fronts that drop temperatures into the single digits for 24 to 48 hours. Temperature extremes are the rule rather than the exception. Humidity is generally low and evaporation high. Canadian and Pacific cold fronts come through the region in fall, winter, and spring, and resulting temperature changes can be rapid.

Total annual precipitation averages 12 to 18 inches. Most of the precipitation comes in the form of rain during the period from May through October. Snowfall averages around 20 inches but ranges from 10 to 36 inches. Rainfall in the growing season often comes as intense showers of relatively short duration. Long-term droughts occur on the average of once every 20 years and may last as long as five to six years. During these drought years moisture during the growing season is from 50 to 60 percent of the mean. Based on long-term records, approximately 60 percent of years are below the mean rainfall and approximately 40 percent are above the mean. May, June ,and July are the main growth months for perennial warm-season grasses. Forbs perform their growth somewhat earlier.

Low air temperatures vary from a monthly mean of 20 degrees F in January to 64 degrees F in July. Mean daily maximum temperatures average in the upper 80’s and low 90’s during the summer months. Winter minimum temperatures fall below the freezing mark much of the time from November through March, with daily lows sometimes reaching 10 degrees F in December and January. Dates of the last killing frost may vary from April 15 to April 22, and the first killing frost from October 15 to October 24.

Winds prevail from the south and southwest, with an average velocity of 12 miles per hour. Generally, March is the windiest month. Strong winds during the spring cause rapid drying of the soil surface.

Table 3. Representative climatic features

Frost-free period (average)	200 days

Freeze-free period (average)	205 days
Precipitation total (average)	18 in

Influencing water features

None.

Soil features

The soils are deep, well-drained, gently sloping, moderately alkaline, calcareous silty clay loams that are reddish brown in color. Inherent fertility is moderate and water holding capacity is high. Water erosion hazard is moderate with good cover, and high with poor cover. Rangeland productive potential is moderate.

Major Soil Taxonomic Units correlated to this site include Quay fine sandy loam, Quay loam, and Quay silty loam.

Table 4. Representative soil features

Parent material	(1) Alluvium–calcareous siltstone
Surface texture	(1) Silty clay loam (2) Loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	40–60 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6–9 in
Calcium carbonate equivalent (0-40in)	3–40%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–2
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The historic climax plant community (HCPC) for the Clay Loam site is best characterized as shortgrass dominant with a few midgrasses, few forbs, and scattered shrubs. Midgrasses occur in areas that receive extra moisture. Forbs vary greatly from year to year depending on amount and timing of precipitation. Shrubs are mostly scattered with isolated small pockets of thicker cover. The site would be classified as a grassland in the HCPC, and can shift toward a shrubland with the invasion of woody shrubs. The HCPC (1.1) consists of blue grama (*Bouteloua gracilis*) as the predominant grass species with a significant amount of galleta (*Pleuraphis jamesii*). Smaller amounts of buffalograss (*Bouteloua dactyloides*), sideoats grama (*Bouteloua curtipendula*), vine mesquite (*Panicum obtusum*), and other mid- and shortgrasses occur. The forb component consists of both perennial and annual species including

rushpea (Hoffmannseggia jamesii), prairie coneflower (*Ratibida columnifera*), lyreleaf greeneyes (Berlandiera larata), wooly paperflower (Psilostrophe villosa), dotted gayfeather (*Liatris punctata*), plains zinnia (*Zinnia grandiflora*), baby white aster (*Chaetopappa ericoides*), scarlet globemallow (*Sphaeralcea coccinea*), wooly plantain (Plantago purshii), and annual broomweed (*Amphiachyris dracunculoides*). Suffrutescent half shrubs such as broom snakeweed (*Gutierrezia sarothrae*) and rayless goldenrod (Isocoma wrightii) are also present in small quantities and are included in the forb table in the plant community list. The major shrub species found on the site are winterfat (*Krascheninnikovia lanata*), Mormon tea (Ephedra sp.), mesquite (*Prosopis glandulosa*), four-wing saltbush (*Atriplex canescens*), and cactus species, namely, cholla (*Cylindropuntia imbricata*) and pricklypear (Opuntia phaecantha). In the HCPC, the mesquite is very scattered but has generally increased in many Clay Loam locations to a moderate canopy. The only tree species found on the site are occasional hackberry (*Celtis laevigata*) and scattered plants of oneseed juniper (*Juniperus monosperma*). Juniper will sometimes form small colonies of thicker cover. The shrub community does not exceed 10 percent of the total plant community production in the HCPC; and is usually less than 5 percent. The productive capacity of the site is moderate and it is grazed readily by domestic livestock.

The soils associated with this site are derived from red bed sediments and are usually quite high in silt content. This tends to make the soils susceptible to surface crusting and water erosion if a good vegetative cover is not maintained. On sites subjected to heavy continuous grazing for long periods where considerable cover has been removed, it is not uncommon to find numerous rills and small gullies forming. Infiltration on this site is moderate in the HCPC because overall vegetative cover is at a maximum, but evaporation and runoff can become excessive if cover decreases past a certain threshold. Gullies can be started very quickly by any major livestock trailing to and from water sources. As cover decreases, patchy bare areas become noticeable and annual weedy species will establish. Moderate levels of grazing with occasional rest usually maintain sufficient perennial cover to keep the site stable.

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In general, the shortgrass species present on the Clay Loam site are drought-tolerant and fairly resistant to grazing pressure, which are desirable characteristics from a site stability standpoint. Continuous heavy grazing will cause the blue grama to lose vigor and these plants may become somewhat sod-bound in appearance. Galleta may increase somewhat at the expense of the blue grama due to less grazing pressure occurring on the galleta. Less overall cover increases runoff and decreases infiltration, therefore increasing the droughty tendencies of the site. With further abusive grazing, some slight pedestalling of bunch grasses begins to occur.

The midgrasses such as sideoats grama and vine mesquite will decrease, leaving low-vigor shortgrass species with a large increase in annual forbs. Overall production will become less and eventually bare areas will appear and increase in size. Surface sheet erosion will increase and annual forbs will compete directly with perennial grasses for both moisture and nutrients. Finally, small gullies and rills become numerous as the low vigor short grasses and annuals offer poor soil protection.

Woody shrub encroachment on this site often occurs simultaneously with the above described decline in vigor and production of perennial grasses, but not always. It is fairly common for mesquite to invade the site with minimal deterioration in the grassland community. Mesquite encroachment is basically a function of seed dissemination, largely through cattle depositing the beans in their manure. Historically, there were small amounts of mesquite present in this region, but certainly it was not the widespread species dominating plant communities as is often the case today. The invasion of woody shrubs and cacti seems to be linked to long-term drought periods in conjunction with poor management practices. Woody plants seem to always increase during wet years following drought periods. During droughts, the grass cover is weakened by severe moisture stress and by over-utilization, and when effective rains finally occur, bare ground is exposed and the perennial grasses are slow to respond due to poor health and vigor. Species with invasive tendencies are better able to establish because of reduced competition. The stronger vigor and overall health of the perennial grasses in the historic plant community enabled these plants to better withstand the rigors of drought. Once woody shrubs such as mesquite establish, strict prescribed grazing along with measures that ac

tually kill or greatly suppress the encroaching shrubs will be necessary in order to shift the community back toward that of the HCPC. The effects of these remedial measures may take several years to be fully realized, and are not of a permanent nature. Once established, shrubs hold a definite competitive advantage over grasses and forbs in a semiarid climate. Most of the woody shrubs in this region are re-sprouters, which renders them difficult to control.

All the sites in this MLRA were historically grazed, and/or browsed by bison, elk, pronghorn, and mule deer (along with numerous small herbivores such as prairie dogs, rabbits, ground squirrels, etc.) in pre-settlement times. The habits of the larger herbivores were semi migratory and after grazing an area, they moved on to other localities where grazing resources were more attractive. Grazed areas received rest naturally and generally the recovery periods following grazing were adequate for vegetation to regain vigor and replenish reserves. The same locations might not have been grazed for several months, and perhaps even years, depending on rainfall patterns and animal movements. Grazing by these large native animals was often intense and animal impact on the range was significant, but the recovery periods were adequate for the healing of both the soil and the vegetative resources. The general lack of streams and surface water in this region may have also regulated grazing of animals such as bison. These herds required large amounts of water and needed to drink with some regularity. Regions to the east of this MLRA likely received more impact from bison because of more dependable water. In general, native grazers played a part in the ecology of the plant communities, providing a graze-rest scenario that allowed those communities to persist. Of course, climatic fluctuations, including drought periods influenced native vegetation as much as any one factor, and there was constantly some minor shifting of species taking place, and production varied from year to year. With settlement of the area, native grazers were replaced with domestic livestock.

The advent of the ranching industry saw a more continuous system of grazing implemented; and with barbed wire, the creation of smaller grazing units allowed for more intense use of the resources. Cattle being transported in from brush-infested regions began to furnish the mechanism for mesquite proliferation. Overstocking was a problem in the late 1800’s and early 1900’s and, unfortunately, it still is today in some areas. Much of the rangeland abuse that occurred was due to lack of knowledge of the capability of the resources. Given this history of past grazing management, an understanding of the capability the resource, and the establishment of a realistic and practical resource management plan should be the goal of all involved in rangeland decision making today.

Natural fire also played a part in the development of plains grasslands. It is generally accepted that fires occurred naturally at least every 8 to 10 years and possibly even more often on some sites. The majority of these natural fires were set by lightning. The sites most likely to burn were those where fuel was most abundant. The Clay Loam site in HCPC usually produces sufficient fine fuel to carry a fire, therefore it is assumed that fires periodically occurred. How sweeping these fires may have been could depend on the overall terrain locally – that is to say – all the sites collectively within a certain area. There are some sites in this MLRA that possess sparse cover and contain certain physical features such as rocky hills, bare soils, and gullied landscapes. These areas had some effect on the continuity of fires. Natural fires often tended to burn in a patchy pattern. The most far-reaching effect of natural fire on native vegetation was to suppress certain woody species and cacti and to help maintain a grassland state. Fires often stimulated forb growth, thereby adding to site diversity at times. Fire influenced wildlife movements as it affected grazing or browsing habits as they were attracted to the fresh growth following a burn. It must be pointed out that naturally occurring fire as it affected the plant communities of pre-settlement times is much different from the way prescribed (or natural) fire will affect a plant community that has deteriorated in ecological condition. Ranges in poor ecological condition may actually be damaged by fire, while healthy plant communities may respond positively. Prescribed fire is a useful tool in range and wildlife management in certain situations. Plant communities can certainly be manipulated by using fire. Most plains grass species are fairly tolerant of fire. Some species of woody plants can be suppressed by proper use of fire provided sufficient fuel is present. Greater plant diversity may result from a properly applied burn. On certain sites where coarser grasses such as tobosa (*Pleuraphis mutica*), galleta (*Pleuraphis jamesii*), alkali sacaton (*Sporobolus airoides*), and giant sacaton (*Sporobolus wrightii*) are found, fire can increase their palatability. Some species (and ecological sites) are more tolerant of fire than others, and this is a most important fact to realize in applying fire. Particular attention must be paid to environmental factors such as soil moisture, temperatures, and season, as well as wind speed, wind direction, and relative humidity. The inability to predict rainfall post-burn is the greatest problem faced in the use of prescribed fire in this MLRA.

Soils, climate, grazing history, and natural fire all worked together to shape the natural plant community on this site; and the interaction of these factors must be understood in order to best formulate an appropriate management scenario to sustain the soil and plant and animal resources.

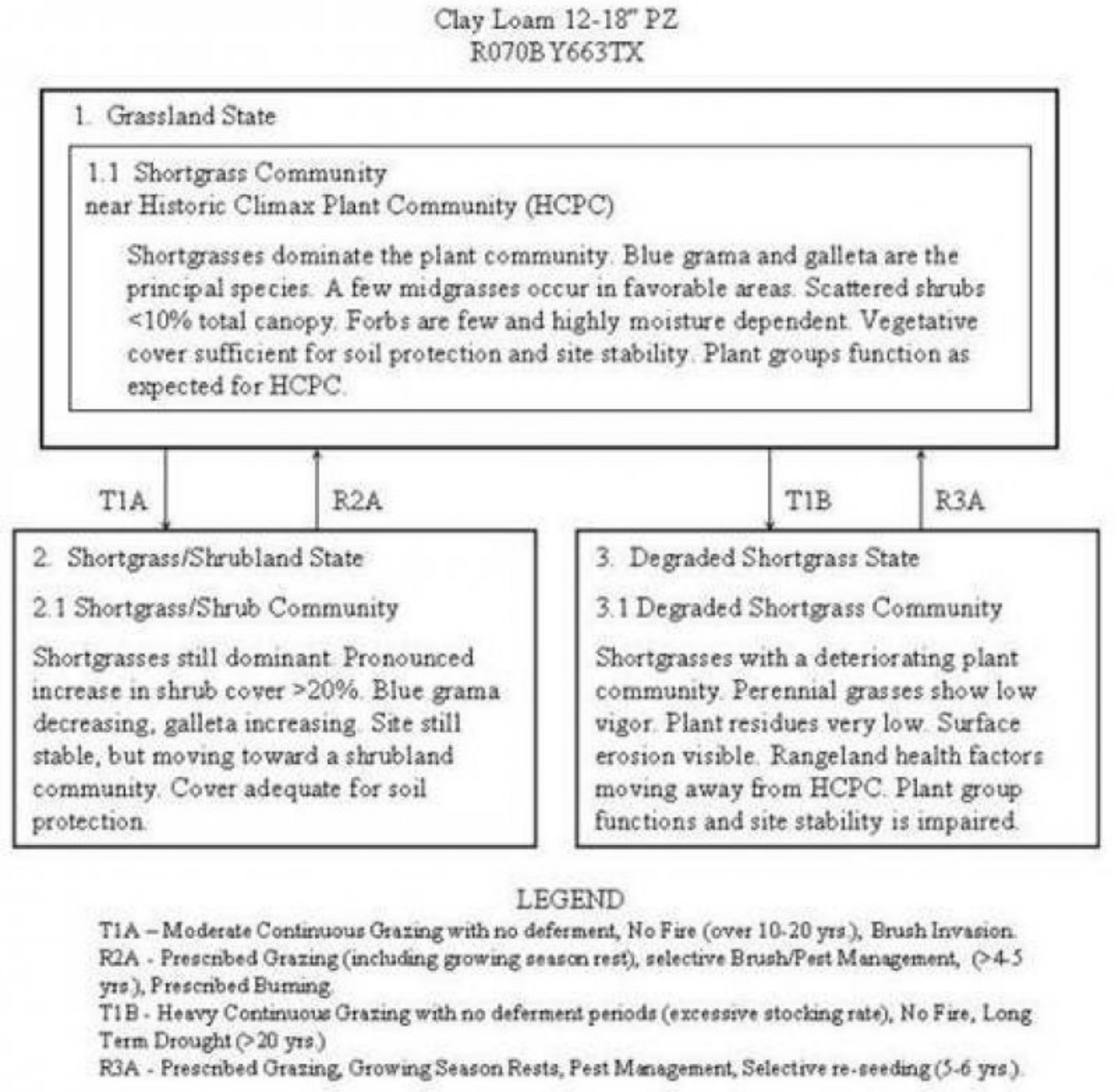
Rangeland Health Reference Worksheets have been posted for this site on the Texas NRCS website (www.tx.nrcs.usda.gov) in Section II of the eFOTG under (F) Ecological Site Descriptions.

STATE AND TRANSITIONAL PATHWAYS : (DIAGRAM)

Narrative:

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



State 1
Grassland State

The historic climax plant community (HCPC) for the Clay Loam site is best characterized as shortgrass dominant with a few midgrasses, few forbs, and scattered shrubs. Midgrasses occur in areas that receive extra moisture. Forbs vary greatly from year to year depending on amount and timing of precipitation. Shrubs are mostly scattered with isolated small pockets of thicker cover. The site would be classified as a grassland in the HCPC, and can shift toward a shrubland with the invasion of woody shrubs.

Community 1.1
Shortgrass Community

Figure 4. 1.1 Shortgrass Community

The Shortgrass Community (1.1) is the interpretive plant community for the Clay Loam ecological site. The plant community is composed of approximately 45 to 60 percent blue grama and 15 to 25 percent galleta, with sideoats grama making up from 5 to 10 percent of total production. Other shortgrass species, forbs and shrubs make up the remainder of the production. Shrubs make up 5 to 8 percent of the total community production. Overall production is moderate compared to other ecological sites in the MLRA. Production for the HCPC ranges from 750 to 1450 pounds of air dry weight per acre. The amount of woody shrubs and cacti shown in this photo is slightly high for the HCPC, but could be considered in the acceptable range. Cholla is the main cactus species and mesquite is present in scattered amounts. Good grazing management will perpetuate a healthy shortgrass community, but, without occasional prescribed fire, or some individual plant treatment on the cholla and the mesquite, this community will slowly shift toward more shrub cover.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	730	990	1250
Shrub/Vine	40	65	90
Forb	40	65	90
Microbiotic Crusts	5	10	15
Tree	0	0	1
Total	**815**	**1130**	**1446**

Figure 6. Plant community growth curve (percent production by month). TX0251, Shortgrass Community with few shrubs. Warm-season shortgrass dominant community with few shrubs and forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	5	10	22	25	10	5	9	8	2	1

State 2
Shortgrass/Shrubland State

The plant community in this state is dominated by shortgrasses. There is a pronounced increase in shrub cover exceeding 20 percent canopy cover. Blue grama is decreasing and galleta is increasing. The site is somewhat stable but is moving towards a shrub-dominated community. Cover is adequate for soil protection.

Community 2.1
Shortgrass/Shrub Community

Figure 7. 2.1 Shortgrass/Shrub Community

The Shortgrass/Shrub Community (2.1) shows some departure from the HCPC but still retains site integrity. Total grass and forb production is still close to that of the HCPC while shrub production is higher. The site is still stable. Ground cover is adequate for soil protection, and plant community functions are not greatly out of balance. However, brush invasion has reached a level of concern if the site is to remain a grassland rather than a shrubland. Brush management, prescribed fire, and prescribed grazing could move this community more toward the HCPC. However, galleta, once established, does not generally yield to an increase in blue grama easily.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	750	975	1200
Shrub/Vine	65	123	180
Forb	40	65	90
Microbiotic Crusts	5	10	15
Tree	0	0	1
Total	**860**	**1173**	**1486**

Figure 9. Plant community growth curve (percent production by month). TX0253, Shortgrass/Shrubs Community. Warm-season shortgrasses with increasing shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	3	5	24	24	13	8	9	7	3	1

State 3
Degraded Shortgrass State

The plant community in this state is dominated by a deteriorating plant community of shortgrasses. Perennial grasses show low vigor. Plant residues are very low. Surface erosion are visible. Rangeland health factors are moving away from the HCPC. Plant group functions and site stability are impaired.

Community 3.1
Degraded Shortgrass Community

This Degraded Shortgrass Community (3.1) indicates deterioration in soil and plant resources. The site has reached a threshold where stability is questionable. Plant community functions have been negatively affected. Plant residues have been significantly reduced. The site has become droughty due to increased runoff and evaporation. Some minor plant pedestalling is evident and cover is no longer adequate to protect the soil. There are definite water flow patterns beginning to form. Soil crusting and increased evaporation is increasing due to reduction in overall cover. There has been no increase in shrub cover on this particular site. Production is greatly lowered and

perennial grasses show lowered vigor. The site now has the potential for annual weedy species to become competitive in wetter seasons. Rangeland health factors indicate definite movement away from the HCPC. This site has been subjected to long-term, continuous, heavy grazing. Prescribed grazing with growing season rest periods and possibly pest management can move this site in the direction of HCPC, but the process may take several seasons to achieve significant improvement.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	350	575	800
Forb	40	53	65
Microbiotic Crusts	0	0	1
Shrub/Vine	0	0	1
Tree	0	0	1
Total	**390**	**628**	**868**

Figure 11. Plant community growth curve (percent production by month). TX0257, Degraded Shortgrass Community. Warm-season shortgrasses having low production, forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4	8	10	23	23	10	5	8	4	3	1

Transition T1A
State 1 to 2

Moderate Continuous Grazing with no deferment, No Fire (over a period of ten to twenty years), and Brush Invasion of cholla and mesquite have lead to the shift from a grassland state to a shortgrass/shrubland state.

Transition T1B
State 1 to 3

Heavy Continuous Grazing with no deferment periods and excessive stocking rate, No fire, and Long-term Drought (greater than twenty years) have lead to the shift from a grassland state to a degraded shortgrass state.

Restoration pathway R2A
State 2 to 1

With the implementation of the following conservation practices: prescribed grazing including growing season rest, and selective Brush and Pest Management (applications every four to five years), the shortgrass/shrubland state can be restored back to the grassland state of a shortgrass-dominated community.

Conservation practices

Brush Management
Prescribed Grazing
Integrated Pest Management (IPM)

Restoration pathway R3A
State 3 to 2

With the implementation of the following conservation practices: prescribed grazing including growing season rest, selective Brush and Pest Management (applications every four to five years), and selective re-seeding (over a five to six year period), the degraded shortgrass state can be restored back to the grassland state of a shortgrass-dominated community.

Conservation practices

Brush Management
Prescribed Grazing
Range Planting
Integrated Pest Management (IPM)

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Shortgrasses**			575–970	
	blue grama	BOGR2	*Bouteloua gracilis*	350–520	–
	James' galleta	PLJA	*Pleuraphis jamesii*	130–240	–
	black grama	BOER4	*Bouteloua eriopoda*	45–100	–
	buffalograss	BODA2	*Bouteloua dactyloides*	40–90	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	10–20	–
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	0–1	–
2	**Midgrasses**			155–280	
	sideoats grama	BOCU	*Bouteloua curtipendula*	90–150	–
	vine mesquite	PAOB	*Panicum obtusum*	30–60	–
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	20–40	–
	western wheatgrass	PASM	*Pascopyrum smithii*	10–20	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	5–10	–
Forb					
3	**Forbs**			40–90	
	Forb, annual	2FA	*Forb, annual*	40–90	–
	lyreleaf greeneyes	BELY	*Berlandiera lyrata*	40–90	–
	rose heath	CHER2	*Chaetopappa ericoides*	40–90	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	40–90	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	40–90	–
	southern goldenbush	ISPL	*Isocoma pluriflora*	40–90	–
	dotted blazing star	LIPU	*Liatris punctata*	40–90	–
	woolly paperflower	PSTA	*Psilostrophe tagetina*	40–90	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	40–90	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	40–90	–
	Rocky Mountain zinnia	ZIGR	*Zinnia grandiflora*	40–90	–
Shrub/Vine					
4	**Shrubs/Vines**			40–90	
	fourwing saltbush	ATCA2	*Atriplex canescens*	40–90	–
	tree cholla	CYIMI	*Cylindropuntia imbricata var. imbricata*	40–90	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	40–90	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	40–90	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	40–90	–

Animal community

This is a grassland site with some shrub cover. Pronghorn, mule deer, and scaled quail utilize the site, along with small mammals such as jackrabbits, ground squirrels, and several species of lizards and snakes. Predators such as coyotes and bobcats range over the site as they hunt for prey.

Plant preference by animal kind:

This rating system provides general guidance as to animal preference for plant species. It also indicates possible competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community. For wildlife, plant preference for food and plant suitability for cover are rated.

P = preferred, D = desirable, U = undesirable, T = toxic, N = not consumed, X = used, degree unknown

Preferred – Percentage of plant in animal diet is greater than it occurs on the land.
Desirable – Percentage of plant in animal diet is similar to the percentage composition on the land.
Undesirable – Percentage of plant in animal diet is less than it occurs on the land.
Not Consumed – Plant would not be eaten under normal conditions. Plants are consumed when other forages are not available.
Toxic – Rare occurrence in diet and, if consumed in any tangible amounts results in death or severe illness in animal.

Hydrological functions

The site's position on the landscape yields runoff which feeds small, lower-lying drainages. Poor cover increases runoff and can cause siltation offsite.

Recreational uses

Hunting, Camping, Hiking, Bird watching, Photography, Horseback Riding

Wood products

None.

Other products

None.

Other information

None.

Inventory data references

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

Inventory Data References (documents) :
NRCS FOTG – Section II - Range Site Descriptions
NRCS Clipping Data summaries over a 20 year period

Other references

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

Wester, David, The Southern High Plains, A History of Vegetation 1540 to Present, USDA Forest Service, RMRS, 2007

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Approval

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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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Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Slight to moderate.

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2. **Presence of water flow patterns:** Slight to moderate.

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

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

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

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

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

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

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Silty clay loam, friable surface, and medium SOM.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Basal cover and density with small interspaces should make rainfall impact minimal. This site has moderate permeability, runoff is moderate, and available water holding capacity is high.

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 shortgrasses >

    Sub-dominant: Warm-season midgrasses >

    Other: Shrubs/Vines = Forbs > Cool-season grasses

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal mortality and decadence.

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

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 815 to 1,445 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, Cholla and Pricklypear.

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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.
