USDA Natural Resources
Conservation Service

Ecological site R070BY662TX
Clayey 12-18" PZ

Last updated: 9/12/2023
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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.

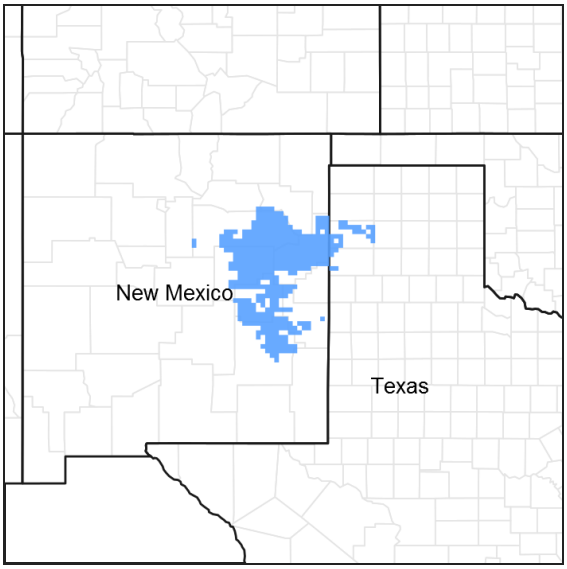


Figure 1. Mapped extent

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): 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.

Associated sites

R070BY663TX	**Clay Loam 12-18" PZ** Often found as an adjacent site. Similar vegetation with loamy sites having less production. Clayey sites will be dominated by galleta.
R070BY664TX	**Red Shale 12-18" PZ** Red Shale sites may occur adjacent to Clayey sites that occur near rough breaks sites. Red shale sites will have limited production with exposed topsoil areas.

Table 1. Dominant plant species

Tree	Not specified

Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs as alluvial flats, alluvial fans, and as swales and valley floors in the plains country. Extra runoff may be received from sites higher on the landscape. Surfaces are slightly concave to slightly convex. The appearance is that of a nearly level topography. Slopes range from 0 to 5 percent but are most generally from 1 to 2 percent. The soils are deep to very deep and are comprised of alluvial or colluvial sediments. The site may occupy large areas of several hundred acres or small areas of less than fifty acres. Runoff is slow due to slope. Infiltration is moderately slow due to clayey soil. Access for grazing animals is excellent.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat (2) Alluvial fan (3) Valley floor
Flooding frequency	None
Ponding frequency	None
Elevation	1,006–1,463 m
Slope	1–5%
Water table depth	152 cm
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)	457 mm

Influencing water features

None.

Soil features

These are deep to very deep clayey soils that are part of the red bed formations of Triassic and Permian ages. Slopes dominantly range from 0 to 5 percent. They are moderate in fertility, have a medium level of water storage capacity, moderate infiltration rates, and exhibit slight to moderate runoff depending on slope and vegetative cover. They yield water to plants readily and are subject to wind erosion without suitable cover. If cover is poor and runoff is excessive, significant water erosion can also occur. Plant roots easily penetrate the soil.

Parent material is moderately fine to medium textured calcareous alluvium. Parent Material Origin is red siltstone, shale, and sandstone from the Triassic, Permian, and Pennsylvanian, Jurassic, Cretaceous, Tertiary, and Quaternary periods that may have been altered by wind.

Major Soil Taxonomic Units correlated to this site include Montoya clay, Montoya clay loam, Montoya silty clay loam, Tucumcari clay loam, and Tucumcari silty clay loam.

Table 4. Representative soil features

Parent material	(1) Alluvium–shale
Surface texture	(1) Clay (2) Silty clay loam (3) Clay loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	102–203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	12.7–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	5–30%
Electrical conductivity (0-101.6cm)	2–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The assumed Historic Climax Plant Community (HCPC) – (1.1) of the Clayey Ecological site of MLRA 70B consists of short- and mid-grasses, with a limited amount of forbs and a limited shrub component. The dominant grass species in the HCPC is galleta (*Pleuraphis jamesii*), with lesser amounts of blue grama (*Bouteloua gracilis*) and buffalograss (*Bouteloua dactyloides*). In some areas, alkali sacaton (*Sporobolus airoides*) can be prominent.

Species found in small percentages include sand dropseed (*Sporobolus cryptandrus*), sand muhly (*Muhlenbergia arenicola*), silver bluestem (*Bothriochloa laguroides*), tumble windmillgrass (*Chloris verticillata*), Hall's panicum (*Panicum hallii*), white tridens (*Tridens albescens*), vine mesquite (*Panicum obtusum*), and western wheatgrass (*Pascopyrum smithii*). Forbs found in historic climax include rushpea (Hoffmannseggia densiflora), scarlet globemallow (*Sphaeralcea coccinea*), lyreleaf greeneyes (Berlandiera larata), upright prairie coneflower (*Ratibida columnifera*), annual broomweed (*Amphiachyris dracunculoides*), scarlet gaura (*Gaura coccinea*), wooly plantain (Plantago purshii), curlycup gumweed (*Grindelia squarrosa*), annual greenthread (*Thelesperma filifolium*), annual sunflower (*Helianthus annuus*), and a few other annual species. Forbs are estimated to be no more than 5 to 8 percent in the HCPC. The more common shrubs are mesquite (*Prosopis glandulosa*) and lotebush (*Ziziphus obtusifolia*), which are both sparse in the HCPC. Cholla cactus (*Cylindropuntia imbricata*) is the most prevalent cactus species and is generally scattered over the site in the HCPC, but can act as a strong increaser, becoming the dominant shrubby plant on this site, and increasing to greater than 350 plants per acre in some cases. Pricklypear (Opuntia phaecantha) is also found frequently. These cactus species seem well adapted to the clayey soil environment. Mormon tea (Ephedra spp.) and fourwing saltbush (*Atriplex canescens*) occur infrequently. The shrubby mesquite seldom reaches more than 6 feet in height. The only tree species present is an occasional hackberry (*Celtis laevigata* var. reticulata). Galleta will always make up the majority of the total annual production for the site, but as long-term grazing pressure increases, the blue grama and buffalograss nearly always decrease somewhat. Alkali sacaton may be more prevalent on portions of the site that receive more natural runoff. The productive capacity of the site in terms of biomass is quite high for this moisture regime.

Soil factors are very influential in the development of the HCPC. The clayey texture and the blocky structure of the subsoil limit the diversity and the nature of plant species present. These soils can store a great deal of soil moisture but this moisture is released to plants rather sparingly. Subsoils are very hard when dry and the blocky structure is somewhat restrictive to plant roots. When dry, deep cracks appear. When wet, these soils are plastic and sticky. Livestock traffic can cause severe compaction during wet periods, especially in areas where vegetative cover is poor. The plant species that occupy this site are drought tolerant and resistant to damage from grazing. They are able to send roots down into the hard blocky subsoil, extract tightly held soil moisture, and are able to endure the high shrink – swell characteristics of the soil. Species composition is not as diverse as on some of the adjacent sites. This site is generally very stable and the plant community is resistant to change caused by livestock grazing pressure and natural influences.

Climate and grazing pressure have major effects on plant community dynamics on this site. While this site is productive in the amount of plant material grown annually, it is not the most preferred site for livestock grazing. The galleta, which usually dominates the site, is not a highly palatable grass, and is somewhat coarse compared to blue grama and buffalograss. Digestibility of galleta is lower due to its coarse nature and animals naturally limit their consumption.

This is a major reason that the total biomass present on this site is usually more than other short grass sites. Livestock (cattle) will often heavily graze the more palatable blue grama and buffalograss occurring on the site and only lightly graze the galleta. This type of spot grazing favors the tobosa and probably results in an even more dominant stand over time. Galleta as well as alkali sacaton are more palatable in the early spring when the new growth is emerging, and cattle do well on it. However, by mid-summer, the leaves have matured and are becoming coarse and less palatable.

On this particular site, natural fire was almost certainly a major ecological influence on the plant community. Periodic burning renders galleta and alkali sacaton much more palatable for herbivores than in unburned areas. The post-burn new growth is relished by domestic livestock, as it most likely was by bison in pre-settlement days. Fires functioned as a means of moving concentrations of grazing animals to areas of more nutritious grazing resources. In addition, the fuel load produced by galleta and alkali sacaton on the clayey site is much greater and exhibits better fuel continuity than on other short grass sites. Fires would have been more intense, therefore causing greater damage to woody shrubs and cacti.

It is estimated that fires occurred on the average of every 8 to 10 years in pristine times which would have also had a marked effect on keeping shrubs suppressed. Cactus in particular is quite susceptible to damage by fire, especially if fuel loads are in the 2000 pounds per acre range. Even if cacti are not completely killed by the burning process, insect damage post-burn nearly always occurs. It would reasonable to assume that periodic fire helped to maintain this site as a grassland community with only a few shrubs. In years of favorable soil moisture, prescribed burning is a useful tool in managing this site.

The Shortgrass Community (HCPC) (1.1) was relatively stable and resilient within the climate, soil, and fire regime. With heavy grazing pressure, long-term drought, , lack of fire, and invasion of cholla, this site can transition into the Shrub/Shortgrass Community phase (2.1). Long-term drought in conjunction with overgrazing is a principal cause of rangeland deterioration on this site and virtually all sites in this MLRA.

Another possible transitional pathway that occurs on this site when heavy continuous grazing, lack of fire, and brush invasion result in a significant increase in both mesquite and cholla, with shrub canopies approaching 15 to 25 percent. This community phase is the Shortgrass/Shrub Community (2.2).

Cholla cactus is a major increaser on this site. There was a small amount of cholla present in the HCPC, but in many places, this species has become a significant problem. Cholla can present a barrier to grazing if present in dense populations, and common ranching practices such as simply riding horseback through the heavily infested pastures can be treacherous. The increase of cholla does not seem to be altogether due to abusive grazing practices since it has increased significantly on properly grazed range as well as heavily grazed sites. Some historians speculate that cholla was spread by sheep grazing in the late 1800's. Supposedly, the tunas would catch in the wool and be transported about. There were considerable sheep present in the area 150 years ago but few if any sheep are being grazed in the region today. Cholla seems to increase in drought cycles as does pricklypear. Mesquite and lotebush can increase on the site with long-term abusive grazing. The major increases of woody shrubs and cacti seem to follow episodic patterns with wet years following long-term drought being the prime times of seedling germination and establishment. Mesquite plants seem to remain rather small in stature on clayey sites, possibly due to less favorable plant, soil, water, and air relationships. This site is resistant to any major changes in plant community due to moderate grazing pressure. Vegetative shifts to different plant communities are usually confined to significant increases in cholla and/or mesquite.

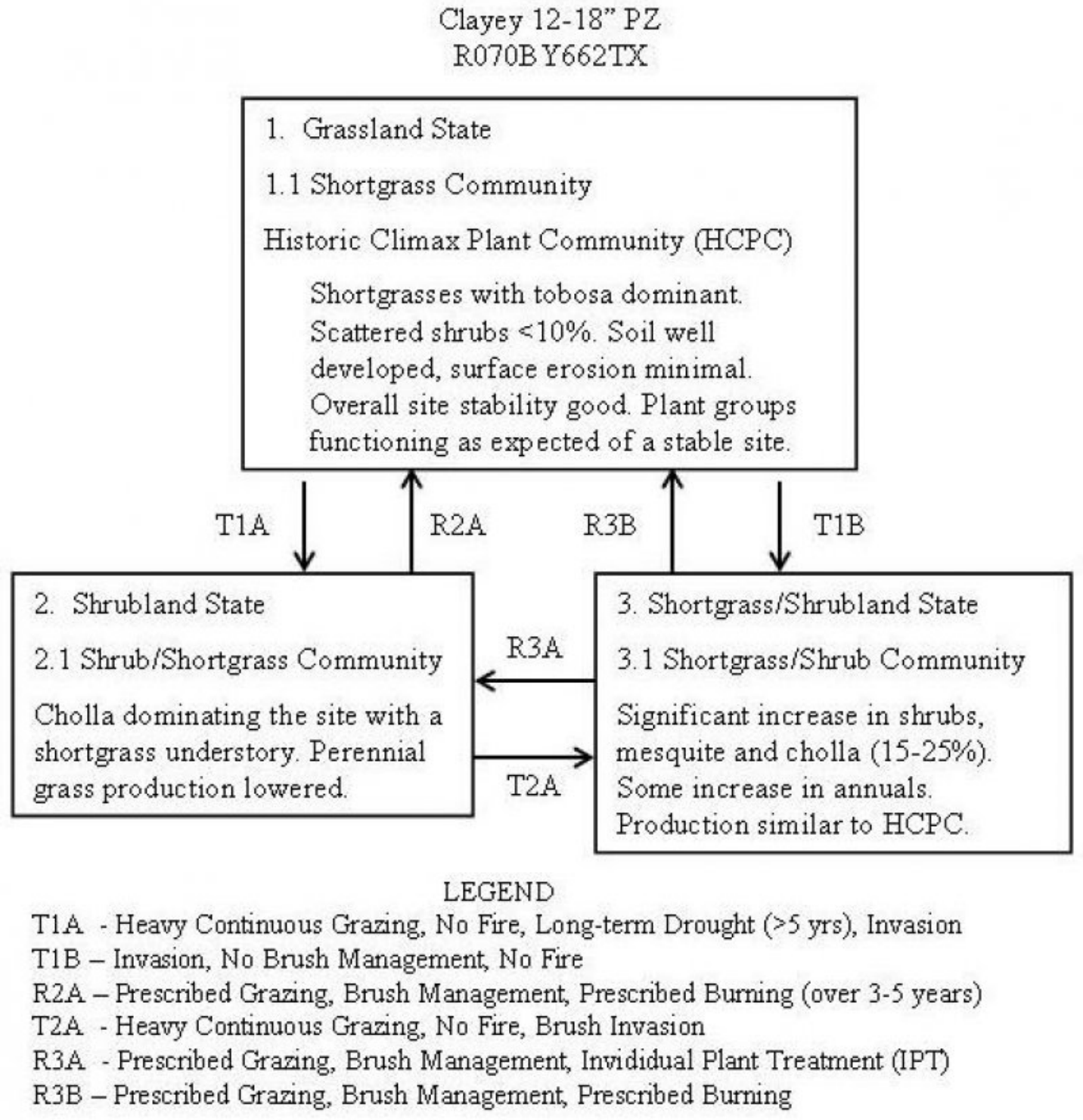
Major deterioration in the grass component of the plant community can happen with severe abuse, but is somewhat rare. In the event of severe abuse, cattle are forced to consume the more unpalatable species, and it is possible to reduce cover to the point where bare soil increases and surface erosion accelerates, with gullies forming. If this occurs, large populations of annual weedy species can be expected to invade and production of perennial species is greatly lowered. This extreme scenario would constitute an irreversible threshold, and would not be common on this site with reasonable livestock management.

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

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 Grassland State is composed of galleta which dominates the site along with lesser amounts of blue grama and buffalograss. There are scattered shrubby plants such as cholla and short mesquite present along with a few perennial forbs and pricklypear. Soils are deep and of a clayey nature. Production is moderately high. Principal plant species are tobosa, blue grama, buffalograss, scarlet globemallow, prairie coneflower, annual broomweed, cholla, and pricklypear.

Community 1.1
Shortgrass Community

Figure 4. 1.1 Shortgrass Community

The Shortgrass Community (1.1) is the interpretive plant community for the Clayey Ecological Site. Galleta dominates the site with lesser amounts of blue grama and buffalograss. There are scattered shrubby plants such as cholla and short mesquite present along with a few perennial forbs and pricklypear. Soils are deep and of a clayey nature. Production is moderately high. Principal plant species are tobosa, blue grama, buffalograss, scarlet globemallow, prairie coneflower, annual broomweed, cholla, and pricklypear. Average annual production ranged from 1,030 to 2,130 lbs. dry weight per acre. An increase in cholla due to suppressed natural fire, long term grazing pressure, and long-term drought will shift the community toward a Shrub/Shortgrass Community (2.1) or possibly a Shortgrass/Shrub Community (3.1), with cholla and shrubby mesquite increasing. Soils, climate, natural fire, and grazing are the major ecological factors influencing this site.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1065	1597	2130
Forb	56	101	146
Shrub/Vine	28	56	84
Microbiotic Crusts	6	17	28
Tree	–	–	1
Total	**1155**	**1771**	**2389**

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
Shrubland State

The shrubland state is dominated by cholla with a shortgrass understory. Perennial grass production is lowered. This state is the result of overgrazing by livestock over a long period of time, lack of fire, and invasion of cholla. The increase in cholla suggests no natural fire for many years and perhaps climatic influences such as long-term drought conditions in the past. Galleta is still the dominant grass species. Annual production of this plant community may be slightly greater than in the HCPC due to the annual production of cholla. Annual production ranges from 1,195 to 1,930 pounds per acre.

Community 2.1
Shrub/Shortgrass Community

Figure 7. 2.1 Shrub/Shortgrass Community

The Shrub/Shortgrass Community (2.1) is the result of overgrazing by livestock over a long period of time, lack of fire, and invasion of cholla. The increase in cholla suggests no natural fire for many years and perhaps climatic influences such as long-term drought conditions in the past. Galleta is still the dominant grass species. Annual production of this plant community may be slightly greater than in the HCPC due to the annual production of cholla. Annual production ranges from 1,195 to 1,930 pounds per acre. It does not appear that the cholla is greatly suppressing the grass production. However, some direct competition for moisture and nutrients is evident. This cholla population poses livestock management problems in that the space this species occupies reduces the available grazing resource. Grasses growing directly under a cholla plant are not likely to be grazed. This sort of population hinders working livestock on horseback. Occasionally, cattle can experience injury from the thorns, especially to their noses and mouths. By applying brush management with appropriate herbicides and prescribed burning, along with prescribed grazing over a 3 to 5 year period of time, this site can be returned to conditions approximating those of the HCPC.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1009	1345	1681
Shrub/Vine	269	317	364
Forb	56	75	95
Microbiotic Crusts	6	17	22
Tree	–	–	1
Total	**1340**	**1754**	**2163**

Figure 9. Plant community growth curve (percent production by month). TX0252, Shrub/Shortgrass Community. Warm-season shrubs and shortgrasses..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2	5	8	18	22	8	5	11	15	4	1

State 3
Shortgrass/Shrubland State

The shortgrass/shrubland state is dominated by a shortgrass understory with cholla. Perennial grass production is lowered. This state is the result of overgrazing by livestock over a long period of time, lack of fire, and invasion of cholla. The increase in cholla suggests no natural fire for many years and perhaps climatic influences such as long-term drought conditions in the past. Galleta is the dominant grass species with an increase in mesquite and cholla. The shrub component is approximately 50/50 mesquite and cholla with total canopy of about 20 percent. Total annual production ranges from 1,130 to 2,115 pounds per acre annually.

Community 3.1
Shortgrass/Shrub Community

Figure 10. 3.1 Shortgrass/Shrub Community

Galleta is the dominant grass species with an increase in mesquite and cholla. The shrub component is approximately 50/50 mesquite and cholla with total canopy of about 20 percent. Total annual production ranges from 1,130 to 2,115 pounds per acre annually. This shift in plant community is a result of heavy continuous grazing and shrub invasion. Both mesquite and cholla will continue to increase unless some type of intervention occurs. Brush management of either broadcast aerial treatment or individual plant treatment, followed by prescribed burning and prescribed grazing, will return the plant community to a conditions approximating those of the HCPC within 3 to 5 years.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1121	1569	2018
Shrub/Vine	90	168	247
Forb	56	73	90
Microbiotic Crusts	6	11	17
Tree	–	–	1
Total	**1273**	**1821**	**2373**

Figure 12. 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

Transition T1A
State 1 to 2

With heavy continuous grazing, no fire and long-term drought conditions (more than five years), and brush invasion of cholla and mesquite, this site would transition from the Grassland State to the Shrubland State.

Transition T1B
State 1 to 3

With brush invasion, no brush management, and no fires, this site would transition from the Grassland State to the Shortgrass/Shrubland State.

Restoration pathway R2A
State 2 to 1

The Shrubland State can be restored to the Grassland State with the implementation of Prescribed Grazing, Brush Management, Prescribed Burning (over a three to five year period) conservation practices.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing
Invasive Plant Species Control

Transition T2A
State 2 to 3

The Shrubland State can transition to the Shortgrass/Shrubland State with continued heavy grazing pressure, no fires, and brush invasion of cholla and mesquite.

Restoration pathway R3B
State 3 to 1

The Shortgrass/Shrubland State can be restored to the Grassland State with the implementation of Prescribed Grazing, Brush Management and Prescribed Burning conservation practices.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing
Invasive Plant Species Control

Restoration pathway R3A
State 3 to 2

The Shortgrass/Shrubland State can be restored to the Shrubland State by implementing conservation practices such as prescribed grazing, brush management and individual plant treatment.

Conservation practices

Brush Management
Prescribed Grazing
Invasive Plant Species Control

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Short/midgrasses**			762–1670	
	James' galleta	PLJA	*Pleuraphis jamesii*	656–1457	–
	alkali sacaton	SPAI	*Sporobolus airoides*	106–213	–

2	**Shortgrasses**			179–269	
	blue grama	BOGR2	*Bouteloua gracilis*	112–168	–
	buffalograss	BODA2	*Bouteloua dactyloides*	67–101	–
3	**Mid/shortgrasses**			67–112	
	silver beardgrass	BOLAT	*Bothriochloa laguroides ssp. torreyana*	11–17	–
	tumble windmill grass	CHVE2	*Chloris verticillata*	11–17	–
	little barley	HOPU	*Hordeum pusillum*	11–17	–
	ear muhly	MUAR	*Muhlenbergia arenacea*	11–17	–
	Hall's panicgrass	PAHA	*Panicum hallii*	11–17	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	11–17	–
	white tridens	TRAL2	*Tridens albescens*	11–17	–
4	**Midgrasses**			56–78	
	western wheatgrass	PASM	*Pascopyrum smithii*	34–45	–
	vine mesquite	PAOB	*Panicum obtusum*	22–34	–
Forb					
5	**Forbs**			56–146	
	prairie broomweed	AMDR	*Amphiachyris dracunculoides*	6–11	–
	lyreleaf greeneyes	BELY	*Berlandiera lyrata*	6–11	–
	Texas croton	CRTE4	*Croton texensis*	6–11	–
	red dome blanketflower	GAPI	*Gaillardia pinnatifida*	6–11	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	6–11	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	6–11	–
	Indian rushpea	HOGL2	*Hoffmannseggia glauca*	6–11	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	6–11	–
	silverleaf nightshade	SOEL	*Solanum elaeagnifolium*	6–11	–
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	6–11	–
	stiff greenthread	THFI	*Thelesperma filifolium*	6–11	–
Shrub/Vine					
6	**Shrubs/Vines**			28–84	
	fourwing saltbush	ATCA2	*Atriplex canescens*	6–11	–
	tree cholla	CYIMI	*Cylindropuntia imbricata var. imbricata*	6–11	–
	Christmas cactus	CYLE8	*Cylindropuntia leptocaulis*	6–11	–
	clapweed	EPAN	*Ephedra antisyphilitica*	6–11	–
	tulip pricklypear	OPPH	*Opuntia phaeacantha*	6–11	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	6–11	–
	lotebush	ZIOB	*Ziziphus obtusifolia*	6–11	–
Tree					
7	**Trees**			0–1	
	netleaf hackberry	CELAR	*Celtis laevigata var. reticulata*	0–1	–

Animal community

This site is used predominantly for livestock grazing. The main native wildlife species that utilize the site are pronghorn, mule deer, and scaled quail. Although woody cover is usually lacking, pronghorn and mule deer will use the site as a bedding ground. Pronghorn does will hide their fawns in the thicker grass. There are a few forbs on the site that are preferred by these animals. Scaled quail use the site for nesting and utilize the cholla and other shrubs as overhead cover from raptors. Jackrabbit, cottontail rabbit, and ground squirrel can be observed, and coyotes, bobcats, and avian predators also use the site to hunt for small mammals.

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.

Preferred (P) – Percentage of plant in animal diet is greater than it occurs on the land.
Desirable (D) – Percentage of plant in animal diet is similar to the percentage composition on the land.
Undesirable (U) – Percentage of plant in animal diet is less than it occurs on the land.
Not Consumed (N) – Plant would not be eaten under normal conditions. It is only consumed when other forages not available.
Emergency (E) - Only eaten when Preferred, Desirable or Undesirable forages are below levels to meet potential animal dry matter intake.
Toxic (T) – Rare occurrence in diet and, if consumed in any tangible amounts results in death or severe illness in animal.

Hydrological functions

Runoff is generally slow due to slope. Infiltration is moderately slow due to clayey soil but good cover enhances opportunity time. Storage capacity is high. Siltation from the site is minimal compared to sites with less vegetative cover. Overland flow can occur but water movement is slow and little water moves off the site. Very little surface erosion is visible with proper management.

Recreational uses

Hunting, Camping, Hiking, Birdwatching, 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.

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 (Ecological Checklist)
Texas A&M Exp. Station, College Station, Texas
Texas Tech University – Range, Wildlife & Fisheries Dept.
Wester, David B., The Southern High Plains: A History of Vegetation, 1540 to Present, USDA Forest Service, RMRS, 2007

Contributors

J.R. Bell

Approval

Kendra Moseley, 9/12/2023

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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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

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

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10 to 15% bare ground.

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):** Moderate resistance to surface erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Clay loam; slightly hard; friable; sticky plastic surface; and moderate SOM.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Basal cover and density is moderately dense; rainfall impact minimal; runoff slow; permeability moderately slow.

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: Cool-season grasses > Shrubs > Forbs

    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 dominately herbaceous.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,030 to 2,130 lbs 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: Cholla, mesquite and pricklypear.

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17. **Perennial plant reproductive capability:** All plant species should be capable of reproduction.
