USDA Natural Resources Conservation Service

Ecological site R077DY040TX
High Lime 12-17" PZ

Last updated: 9/11/2023
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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): 077D–Southern High Plains, Southwestern Part

This area is characterized by nearly level to gently undulating plains with scattered playa depressions. Soil temperature regime is thermic and soil moisture regime is aridic bordering on ustic. Sandy and loamy soils are generally well drained and range from shallow to deep and medium- to coarse-textured. Native vegetation is short- to mid-grasses and sandy sites support tall-grasses with sand shin oak and mesquite. Current land use is mainly rangeland, although irrigated cropland is expanding.

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 calcareous, sandy loam soils on dune-like topography. The reference plant community consists of midgrasses and shortgrasses with traces of forbs and shrubs. Plants adapted to high lime soil conditions dominate the site. abusive grazing practices can alter the vegetative composition and result in a shift in the plant community.

Associated sites

R077DY046TX	**Sandy 12-17" PZ** Sandy sites often occur as an upland site downslope to the east of the High Lime sites. Tallgrasses dominate a good mixture of midgrasses are on this site. Production is higher on the Sandy site than on the High Lime site.
R077DY041TX	**Lakebed 12-17" PZ** Occurs adjacent to on the south/southwest side of the High Lime sites. Shortgrasses dominate but some midgrasses and many forbs can be found on the site. Production is higher on the Lakebed site than on the High Lime site.
R077DY042TX	**Limy Upland 12-17" PZ** Limy upland sites typically occur as an upland site surrounding the lakebed and High Lime sites. Midgrasses dominate but a good mixture of Shortgrasses are found on this site. Production is higher on the Limy Upland site than on the High Lime site.

Similar sites

R077DY042TX	**Limy Upland 12-17" PZ** Limy Upland is similar to High Lime sites in the respect they both have calcareous loamy soils with High Lime sites having a much higher lime content. They both are dominated by midgrasses with production much lower on the High Lime sites. Limy upland sites are preferred sites where as High Lime sites are not.
R077CY026TX	**High Lime 16-21" PZ** The Limy Upland site in MLRA 77C is similar to the High Lime site in MLRA 77D in the respect they both have calcareous loamy soils. The MLRA 77C site has higher Mean Annual Precipitation (16 - 21 inches).They both have similar vegetative communities with production lower on the MLRA 77D High Lime site.
R077EY057TX	**Limy Upland 16-24" PZ** Limy Upland site in MLRA 77E is similar to the MLRA 77D High Lime site in the respect they both have calcareous loamy soils with High Lime sites having a much higher lime content. They both have similar vegetative communities with production much lower on the MLRA 77D High Lime site. The MLRA 77E Limy Upland site has higher Mean Annual Precipitation (16 - 24 inches). Limy upland sites are preferred sites where as High Lime sites are not.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens*
Herbaceous	(1) *Sporobolus airoides* (2) *Bouteloua curtipendula*

Physiographic features

The High Lime ecological site consists of very deep, very gently to gently sloping calcareous loamy soils with light colored surfaces and moderately permeable fine sandy loam to sandy clay loam subsoils. Slopes dominantly range from 1 to 5 percent. Due to the slope these sites typically generate runoff and these sites are susceptible to both wind and water erosion if adequate vegetative cover is not present. The site is used almost entirely as a rangeland.

Landform: Convex, linear, and curvilinear dunes on the leeward (eastern) margin of playa or salt lake basins to nearly level to very gently sloping terraces.

Table 2. Representative physiographic features

Landforms	(1) Plateau > Playa dune
Runoff class	Medium to high
Flooding frequency	None
Ponding frequency	None

Elevation	762–1,554 m
Slope	1–5%
Water table depth	203 cm
Aspect	W, NW, S, SW

Climatic features

Continental Steppe climate is prevalent in MLRA 77D. This climate type is typical of interiors of continents and is characterized by large variations in the magnitude of ranges in daily temperature extremes, low relative humidity, and irregularly spaced rainfall of moderate amounts. This climate regime is also known for being semi-arid with mild winters.

Droughts occur with monotonous frequency although there will be years having excessive precipitation resulting in large accumulations of water that little benefit is obtained from the rainfall events. If good rainfall events occur in the spring and summer months, annual production will be favorable, even while the remainder of the year is not favorable. Most of the annual precipitation occurs as a result from mid to late summer thunderstorms. There is very little precipitation and infrequent snowfall amounts in the winter.

During the late winter and early spring months, dust storms occur very frequently. The flat plains of the area contribute very little resistance to the strong winds. Dust in many of these storms remains in the air for several days after the storms have passed.

Daytime temperatures are warm in the summer but there is a large diurnal range and most nights are comfortable. In summers, the normal daily maximum temperatures are in the low to mid 90s and the normal minimum temperatures are in the upper 60s and low 70s. Even though the temperatures may be high, the low humidity and high evaporation rates create a cooling effect during the nighttime hours. Fall months exhibit extremely variable weather. Winters are mild and are characterized by frequent cold fronts accompanied by strong, gusty, northerly winds. Most of the cold fronts are dry as they pass through the area.

Table 3. Representative climatic features

Frost-free period (characteristic range)	154-191 days
Freeze-free period (characteristic range)	181-194 days
Precipitation total (characteristic range)	381-432 mm
Frost-free period (actual range)	147-195 days
Freeze-free period (actual range)	171-213 days
Precipitation total (actual range)	381-432 mm
Frost-free period (average)	167 days
Freeze-free period (average)	190 days
Precipitation total (average)	406 mm

Climate stations used

- (1) MELROSE [USC00295617], Melrose, NM
- (2) ELIDA [USC00292854], Elida, NM
- (3) CROSSROADS 2 [USC00292207], Crossroads, NM
- (4) CAPROCK [USC00291445], Caprock, NM
- (5) TATUM [USC00298713], Tatum, NM
- (6) HOBBS 13W [USC00294030], Lovington, NM
- (7) ANDREWS [USC00410248], Andrews, TX
- (8) ODESSA SCHLEMEYER FLD [USW00003031], Odessa, TX
- (9) K-BAR RCH [USC00414710], Odessa, TX

Influencing water features

Water features do not influence this site.

Wetland description

None.

Soil features

These soils are calcareous (limy) throughout and the water holding capacity is moderate. The calcium carbonate content may limit the plant community to tolerant plant species. Plant roots will easily penetrate the soil if not severely compacted. Fertility is low and these soils have a moderate permeability rate. They yield water to plants readily. If vegetative cover is poor and runoff is excessive, significant wind and water erosion can occur.

Major Soil Taxonomic Units correlated to this site include: Krade fine sandy loam and Tornero soils.

Table 4. Representative soil features

Parent material	(1) Eolian deposits–igneous, metamorphic and sedimentary rock
Surface texture	(1) Fine sandy loam (2) Sandy clay loam
Family particle size	(1) Coarse-loamy (2) Fine-loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	3–30%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (0-101.6cm)	0–5%
Subsurface fragment volume >3" (0-101.6cm)	0%

Ecological dynamics

This site is not generally a preferred site for grazing by livestock or wildlife due to lower palatability of the plants that are influenced by the limy nature of the soil. The high lime content limits the plant community to lime-tolerant plant species. The High Lime site is considered a minor component of MLRA 77D. This site usually occurs on the east and northeast side of ancient salt lakes and basins as flats and low rolling hills and ridges. This site is a product of the prevailing south/southwest winds removing soil particles from the bottoms of dry lakes and large basins during extended drought periods. Thus, the deposition of the sediment occurred on the east and northeast sides of the lakes and basins over time creating the high lime site.

The Reference Plant Community is the Midgrass/Shortgrass Community (1.1). It is a mixture of midgrass and shortgrass species. On the slopes and ridges, alkali sacaton (*Sporobolus airoides*), black grama (*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), and sideoats grama (*Bouteloua curtipendula*) were the dominant grass species. The more common grasses in the low lying areas were vine mesquite (*Panicum obtusum*), cane bluestem (*Bothriochloa barbinodis*), plains bristlegrass (*Setaria macrostachya*), with lesser amounts of inland saltgrass (*Distichlis spicata*), sand dropseed (*Sporobolus cryptandrus*), slim tridens (*Tridens muticus*), tobosagrass (*Pleuraphis mutica*), and perennial threeawn (*Aristida purpurea*). Grasses make up approximately 95% of the total annual production. Only traces of forbs can be found on the site, typical associated forbs included plains blackfoot (*Melampodium leucanthum*), curlycup gumweed (*Grindelia squarrosa*), dotted gayfeather (*Liatris punctata*), Texas croton (*Croton texensis*), along with a few other annual and perennial forbs. Fourwing saltbush (*Atriplex canescens*) is the primary woody species on the High Lime sites making up <5% of the total annual production.

The close proximity of this site to ancient lakes and large basins, which are flooded periodically, made this site a good grazing and loafing area during watering events for large numbers of bison and resident pronghorn antelope. However, once the lakes dried up, the herds would move out of the area. Long rest periods followed until the next big rainfall event, allowing the vegetation to re-establish itself and maintain its historic climax plant community structure. Periodic droughts, fire, and grazing by resident wildlife prevalent in the area as well as nomadic creatures such as bison did influence the plant community. The open, treeless landscape makes this site especially suitable for antelope. Grasses such as plains bristlegrass and vine mesquite attract dove and quail.

Fire played a part in the ecology of this site as with all plains sites. The main effect of fire on the High Lime site was to stimulate growth and reduce old decadent plant cover from previous years. Fire helped in the reduction of old growth, stimulated new shoots and helped in breaking down accumulated plant material thus aiding the nutrient cycle. Fire may have also helped in favoring the perennials over the annual species.

The major forces influencing the transition away from the reference community are continued overgrazing by livestock for extended periods and the decrease in the frequency and intensity of fire. As livestock and wildlife numbers increase and grazing use exceeds a plant's ability to withstand defoliation, the more palatable and generally more productive species decline in stature, productivity, and density.

If excessive grazing does occur for long periods, ecological retrogression takes place. As retrogression proceeds, this will bring about the Shortgrass/Midgrass/Annuals Community (1.2) phase with decreased amounts of low vigor sideoats grama and blue grama. Less palatable species such as alkali sacaton will increase along with inland saltgrass, dropseed species and perennial threeawns. The few better quality perennial forbs will be replaced with less desirable annual and perennial forbs. Fourwing saltbush will begin to increase. This phase is reversible with proper grazing management and prescribed burning. The primary benefit of prescribed burning would be to reduce the excessive biomass of alkali sacaton and inland saltgrass and promote new sideoats grama and blue grama seedlings. Woody shrub canopies have generally not increased to the point where brush management is needed. There will be an increase in the percent bare ground scattered throughout the site.

If long term heavy grazing continues, a threshold will be crossed as this site transitions to the (2.1) Shrub/Shortgrass/Annuals Community. Alkali sacaton will increase on the slopes and ridges along with an invasion of low quality shortgrasses such as burrograss (*Scleropogon brevifolius*), fluffgrass (*Tridens texanus*) and hairy tridens (*Erioneuron pilosum*). Fourwing saltbush will dominate the site. Some sites may see broom snakeweed (*Gutierrezia sarothrae*) gain a foothold and increase to the point of sub-domination. Inland saltgrass and salt cedar (*Tamarix ramosissima*) will typically invade the low lying areas. Western ragweed (*Ambrosia psilostachya*) and sagewort (Artemisia spp.) will be common throughout the site. This site will develop bare areas (>40% bare soil) with a dramatic increase in annuals filling the voids. The short and midgrass species that do remain will be in low vigor. The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. Restoration will require prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical brush and pest management. Full recovery and maintenance of the reference state requires continued proper grazing management as well as occasional brush and pest management.

As mentioned earlier, this site is not preferred by livestock for grazing due to the low palatability of the forage, which is influenced by the limy nature of the soil. Therefore, if livestock are being forced to overgraze this undesirable site, then there is obviously a grazing management problem on the surrounding associated sites. Livestock generally will

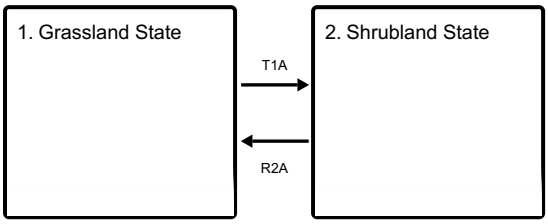
not frequent this site unless all other available forage in the pasture has been removed.

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)
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.

State and transition model

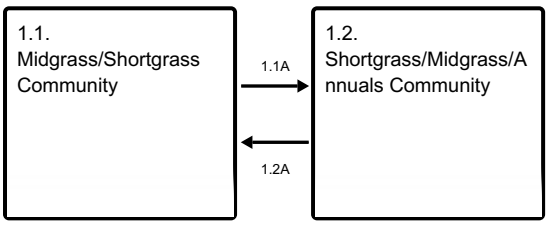
Ecosystem states



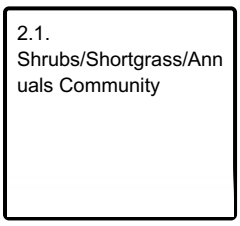
T1A - Absence of disturbance and natural regeneration over time, coupled with excessive grazing pressure and prolonged drought conditions

R2A - Adequate rest from defoliation and removal of woody canopy, followed by rangeland seeding

State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Grassland State

The resulting Midgrass/Shortgrass Community (1.1) was a mixture of midgrass and shortgrass species. On the slopes and ridges, alkali sacaton, black grama, blue grama, and sideoats grama were the dominant grass species. The more common grasses in the low lying areas were vine mesquite, cane bluestem, and plains bristlegrass. Grasses made up approximately 95% of the total annual production. Only traces of forbs could be found on the site, typical associated forbs included plains blackfoot, curlycup gumweed, dotted gayfeather, Texas croton, along with a few other annual and perennial forbs. Fourwing saltbush was the primary woody species on the High Lime sites making up <5% of the total annual production. With excessive grazing over long periods, ecological retrogression takes place. This will bring about the Shortgrass/Midgrass/Annuals Community (1.2) phase with decreased amounts of low vigor black grama, sideoats grama and blue grama. Less palatable species such as alkali sacaton will increase along with inland saltgrass, dropseed species and perennial threeawns. The few better quality perennial forbs will be replaced with less desirable annual and perennial forbs. Fourwing saltbush will begin to increase. Broom snakeweed may invade some sites. Once established, broom snakeweed can increase to the point of domination. The total production will be approximately 850 to 1,650 pounds per acre.

Dominant plant species

- alkali sacaton (*Sporobolus airoides*), grass
- sideoats grama (*Bouteloua curtipendula*), grass

Community 1.1
Midgrass/Shortgrass Community

Figure 8. 1.1 Midgrass/Shortgrass Community

The interpretive or "reference" plant community is the Midgrass/Shortgrass Community (1.1) with a mixture of midgrass and shortgrass species. On the slopes and ridges, alkali sacaton, black grama, blue grama, and sideoats grama are the dominant grass species. The more common grasses in the low lying areas are vine mesquite, cane bluestem, plains bristlegrass, with lesser amounts of inland saltgrass, sand dropseed, slim tridens, tobosagrass, and perennial threeawn. Grasses make up approximately 95% of the total annual production. Only traces of forbs will be found on the site with <5% fourwing saltbush as the primary woody species. Total annual production ranges from 800 to 1,600 pounds per acre. This site is not generally a preferred site for grazing by livestock or wildlife due to lower palatability of the plants that are influenced by the limy nature of the soil. The high lime content limits the plant community to tolerant plant species. Therefore, if livestock are being forced to overgraze this undesirable site, then there is obviously a grazing management problem on the surrounding associated sites. Livestock generally will not frequent this site unless all other available forage in the pasture has been removed.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	852	1278	1704
Shrub/Vine	39	56	73
Forb	–	11	17
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**891**	**1345**	**1794**

Figure 10. Plant community growth curve (percent production by month). TX1256, Midgrass/Shortgrass Community. Warm season mid/shortgrass species, few forbs and <5% shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	5	20	25	17	8	15	4	1	1

Community 1.2
Shortgrass/Midgrass/Annuals Community

Figure 11. 1.2 Shortgrass/Midgrass/Annuals Community

With excessive grazing over long periods, ecological retrogression takes place. This will bring about the Shortgrass/Midgrass/Annuals Community (1.2) phase with decreased amounts of low vigor black grama, sideoats grama and blue grama. Less palatable species such as alkali sacaton will increase along with inland saltgrass, dropseed species and perennial threeawns. The few better quality perennial forbs will be replaced with less desirable annual and perennial forbs. Fourwing saltbush will begin to increase. Broom snakeweed may invade some sites. Once established, broom snakeweed can increase to the point of domination. The total production will be approximately 850 to 1,650 pounds per acre. Forage production is still predominantly grasses (70 – 75%) of the total site production. This phase is reversible with proper grazing management and prescribed burning. The primary benefit of prescribed burning would be to reduce the excessive biomass of alkali sacaton and inland saltgrass and promote new sideoats grama and blue grama seedlings. Selective brush and pest management may be needed on some sites. Bare ground has increased somewhat exposing the soil to wind and water erosion. Nutrient and energy cycling, and water use efficiency has changed for the worse. Diversity and productivity will be less than site potential.

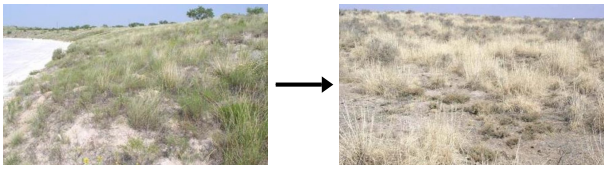
Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	673	1065	1457
Shrub/Vine	168	196	224
Forb	112	140	168
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**953**	**1401**	**1849**

Figure 13. Plant community growth curve (percent production by month). TX1251, Warm-season bunchgrasses w/ forbs & shrubs. Warm-season bunchgrasses with forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	3	5	12	16	15	20	18	9	1	0

Pathway 1.1A
Community 1.1 to 1.2

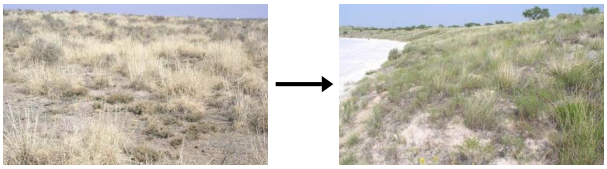


Midgrass/Shortgrass Community

Shortgrass/Midgrass/Annuals Community

This site is not generally a preferred site for grazing by livestock or wildlife due to lower palatability of the plants that are influenced by the limy nature of the soil. However, due to heavy continuous grazing, no fires, no brush management, and no pest management practices, this Midgrass/Shortgrass Community will shift to the Shortgrass/Midgrass/Annuals community.

Pathway 1.2A
Community 1.2 to 1.1



Shortgrass/Midgrass/Annuals Community

Midgrass/Shortgrass Community

This phase is reversible to the Midgrass/Shortgrass Community with proper grazing management and prescribed burning. The primary benefit of prescribed burning would be to reduce the excessive biomass of alkali sacaton and inland saltgrass and promote new sideoats grama and blue grama seedlings. Selective brush and pest management may be needed on some sites.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing
Integrated Pest Management (IPM)

State 2
Shrubland State

Alkali sacaton will increase on the slopes and ridges along with an invasion of low quality shortgrasses such as burrograss, fluffgrass and hairy tridens. Fourwing saltbush will dominate, on some sites broom snakeweed may increase to the point of sub-domination. Inland saltgrass and salt cedar will typically invade the low lying areas. Western ragweed and sagewort will be common throughout the site with a dramatic increase in annuals filling the voids. The short and midgrass species that do remain will be in low vigor. Total production will be approximately 900 to 1,400 pounds per acre with shrubs and annuals accounting for 60 – 70% of the site production.

Dominant plant species

- fourwing saltbush (*Atriplex canescens*), shrub
- alkali sacaton (*Sporobolus airoides*), grass

Community 2.1
Shrubs/Shortgrass/Annuals Community

Figure 14. 2.1 Shrubs/Shortgrass/Annuals Community

As long-term heavy grazing continues, a threshold will be crossed as this site transitions to the Shrub/Shortgrass/Annuals Community (2.1). Alkali sacaton will increase on the slopes and ridges along with an invasion of low quality shortgrasses such as burrograss, fluffgrass and hairy tridens. Fourwing saltbush will dominate, on some sites broom snakeweed may increase to the point of sub-domination. Inland saltgrass and salt cedar will typically invade the low lying areas. Western ragweed and sagewort will be common throughout the site with a dramatic increase in annuals filling the voids. The short and midgrass species that do remain will be in low vigor. Herbaceous forage production is less than half of the reference community. Total production will be approximately 900 to 1,400 pounds per acre with shrubs and annuals accounting for 60 – 70% of the site production. The hydrological cycle has been adversely affected. Large bare areas (>40%) may occur with overland flow while erosion from wind and water has increased. Large blowout areas may develop from excessive wind erosion, once this occurs, re-vegetating these areas will be difficult. The plant community is so degraded that it cannot reverse retrogression without extensive energy and management inputs. The amount of energy and economic inputs required to bring about a change in the plant community balance may vary a great deal depending on the present state and desired results. Prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical brush and pest management will be required. Full recovery and maintenance of the reference state requires continued proper grazing management as well as occasional brush and pest management.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	448	560	673
Grass/Grasslike	336	448	560
Forb	224	280	336
Microbiotic Crusts	–	–	–
Tree	–	–	–
Total	**1008**	**1288**	**1569**

Figure 16. Plant community growth curve (percent production by month). TX1254, Shrub/Shortgrass/Annuals Community. Spring and fall growth of shortgrasses, annuals, and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	4	6	10	16	15	20	15	12	1	0

Transition T1A
State 1 to 2

With continued heavy grazing pressure, no fires, long-term droughts, no brush management, and no pest management, the grassland state for the High Lime ecological site will transition to the Shrubland State.

Restoration pathway R2A
State 2 to 1

Prescribed grazing with rest periods during the growing season, re-seeding bare areas with adapted native grass species, and chemical brush and pest management will be required. Full recovery and maintenance of the reference state(1) requires continued proper grazing management as well as occasional brush and pest management.

Conservation practices

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

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	**Midgrasses**			168–336	
	alkali sacaton	SPAI	*Sporobolus airoides*	168–336	–
2	**Short/Midgrasses**			297–588	
	black grama	BOER4	*Bouteloua eriopoda*	127–252	–
	blue grama	BOGR2	*Bouteloua gracilis*	85–168	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	85–168	–
3	**Midgrasses**			213–426	
	vine mesquite	PAOB	*Panicum obtusum*	85–170	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	85–170	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	43–85	–
4	**Short/Midgrasses**			179–359	
	Wright's threeawn	ARPUW	*Aristida purpurea var. wrightii*	36–72	–
	saltgrass	DISP	*Distichlis spicata*	36–72	–
	tobosagrass	PLMU3	*Pleuraphis mutica*	36–72	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	36–72	–
	slim tridens	TRMU	*Tridens muticus*	36–72	–
Forb					
5	**Forbs**			0–17	
	Texas croton	CRTE4	*Croton texensis*	0–17	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–17	–
	dotted blazing star	LIPU	*Liatris punctata*	0–17	–
	plains blackfoot	MELE2	*Melampodium leucanthum*	0–17	–
	grassland blazingstar	MEST3	*Mentzelia strictissima*	0–17	–
	evening primrose	OENOT	*Oenothera*	0–17	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	0–17	–
	stiff greenthread	THFI	*Thelesperma filifolium*	0–17	–
Shrub/Vine					
6	**Shrubs/Vines**			39–67	
	fourwing saltbush	ATCA2	*Atriplex canescens*	39–67	–

Animal community

Native animals that utilize this site include scaled quail, pronghorn antelope, coyote, jackrabbits, Texas horned lizard, prairie dogs, and various small mammals and grassland birds. This site is typically an open grassland area with very little woody cover surrounding ancient lakebeds and large basins. Therefore, species that require cover will not be resident wildlife.

Hydrological functions

The soils consists of gently sloping areas with deep, well drained, moderately rapid permeable upland soils occurring on the eastern and northeastern side of ancient lakes and basins. Runoff from the site contributes to the lakes and basins with water supply. With good cover, runoff contains low sediment. If cover is poor, very little water gets into the soil, increased sediment loads in the runoff.

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 documentation.

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

Other references

Other references: (List other references used in the description or correlation of this site.)
J.R. Bell, USDA-NRCS Rangeland Management Specialist (retired)
Natural Resources Conservation Service - Range Site Descriptions
USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database
Rathjen, Frederick W., The Texas Panhandle Frontier, Rev. 1998, Univ. of Texas Press
Hatch, Brown and Ghandi, Vascular Plants of Texas (Ecological Checklist)
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Approval

Bryan Christensen, 9/11/2023

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.

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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.

Author(s)/participant(s)	Stan Bradbury, Zone RMS, NRCS, Lubbock, Texas
Contact for lead author	806-791-0581
Date	09/04/2007
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

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

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

3. **Number and height of erosional pedestals or terracettes:** Slight to moderate.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 30-40% bare ground.

5. **Number of gullies and erosion associated with gullies:** Slight.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight to moderate.

7. **Amount of litter movement (describe size and distance expected to travel):** Slight to moderate.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Moderate resistance to surface erosion; primarly by wind erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Calcareous (limy) loamy soils with low 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 large interspaces should make rainfall impact moderate. This site has moderately permeable soils; runoff is slow to medium; and available water holding capacity is moderate to low.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Warm-season midgrasses >

    Sub-dominant: Warm-season shortgrasses >

    Other: Cool-season midgrasses > Warm-season tallgrasses > Forbs > Shrubs/Vines > Trees

    Additional:

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 minimal.

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

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1,400 to 1,750 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:** Yucca, cholla, and pricklypear can become invasive.

17. **Perennial plant reproductive capability:** All plants species should be capable of reproduction except during periods of prolonged drought conditions, heavy natural herbivory or intense wildfires.