UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R042XD001NM

Site Name: Loamy

Precipitation or Climate Zone: 12-14 inches

Phase:

PHYSIOGRAPHIC FEATURES

Narrative:

This site is usually in a topographic setting to receive some extra run-on water from adjacent higher terrain. The site occurs on fan aprons and inset fans on broad uplands. Slopes range from 0 to 5 percent. Elevations range from 4700 to 6000 feet above sea level.

Land Form:

1. Fan apron
2. Inset fan
3.

Aspect:

1. No influence on this site.
2.
3.

	Minimum	Maximum
Elevation (feet)	4700	6000
Slope (percent)	0	5
Water Table Depth (inches)	>60	>60

Flooding:	**Minimum**	**Maximum**
Frequency	**Rare**	**Rare**
Duration	**Very brief**	**Very brief**

Ponding:	**Minimum**	**Maximum**
Depth (inches)		
Frequency	None	**None**
Duration	None	**None**

Runoff Class:

Low to Medium

CLIMATIC FEATURES

Narrative:

Average precipitation for this site is approximately 12 to 14 inches. Variations of 5 inches are not uncommon. Approximately 75 percent of this occurs from May through October with most of the rainfall occurring from July to September. Most of the summer precipitation comes in the form of high intensity short duration thunderstorms. Although little precipitation does occur during the winter month, rain and snow of low intensity usually characterize the precipitation that does occur. Temperatures are mild. Freezing temperatures are common at night from December through April, however, temperatures during the day are frequently above 50 degrees F. Occasionally in December to February brief periods of 0 degree F. Temperatures may be expected. During June to August some days may exceed 100 degrees F.

The mean annual precipitation figures are derived from rain gauge data collected by the BLM (1971 to 1990), and NOAA weather maps utilizing prism model estimation techniques. There are no permanent weather stations within the boundaries of the Land Resource Unit.

	Minimum	**Maximum**
Frost-free period (days):	140	180
Freeze-free period (days):	145	185
Mean annual precipitation (inches):	12	14

Monthly moisture (inches) and temperature (^{0}F) distribution:

	Precip. Min.	Precip. Max.	Temp. Min.	Temp. Max.
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

Climate Stations:

Station ID _____ Location _____ Period From: _____ To: _____

Station ID _____ Location _____ Period From: _____ To: _____

Station ID _____ Location _____ Period From: _____ To: _____

Station ID _____ Location _____ Period From: _____ To: _____

INFLUENCING WATER FEATURES

Narrative:

This site is not influenced by water from wetland or stream.

Wetland description:

System	Subsystem	Class
N/A		

If Riverine Wetland System enter Rosgen Stream Type:
N/A

REPRESENTATIVE SOIL FEATURES

Narrative:

The soils of this site are deep to very deep. They formed in alluvium derived from limestone. The surface layers are loam, and silt loam. The underlying layers are loam, clay loam, sandy clay loam, silt loam, or silty clay loam. The soils are well drained and have a moderately slow permeability. Available water capacity is moderate. This site usually receives some extra water from higher surrounding terrain. If unprotected by vegetative cover the soils become susceptible to erosion.

Parent Material Kind: Alluvium
Parent Material Origin: Limestone

Surface Texture:

1. Loam
2. Silt loam

Surface Texture Modifier:

1. N/A

Subsurface Texture Group: Loamy
Surface Fragments <=3" (% Cover): 0-5
Surface Fragments >3" (% Cover): 0
Subsurface Fragments <=3" (%Volume): 0-5
Subsurface Fragments <=3" (%Volume): 0

	Minimum	Maximum
Drainage Class:	Moderately well	Well drained
Permeability Class:	Moderately slow	Moderate
Depth (inches):	60	80
Electrical Conductivity (mmhos/cm):	0	4
Sodium Absorption Ratio:		
Soil Reaction (1:1 Water):	7.4	8.4
Soil Reaction (0.1M CaCl2):		
Available Water Capacity (inches):	5.8	6.8
Calcium Carbonate Equivalent (percent):	0	40

PLANT COMMUNITIES

Ecological Dynamics of the Site:

Plant Communities

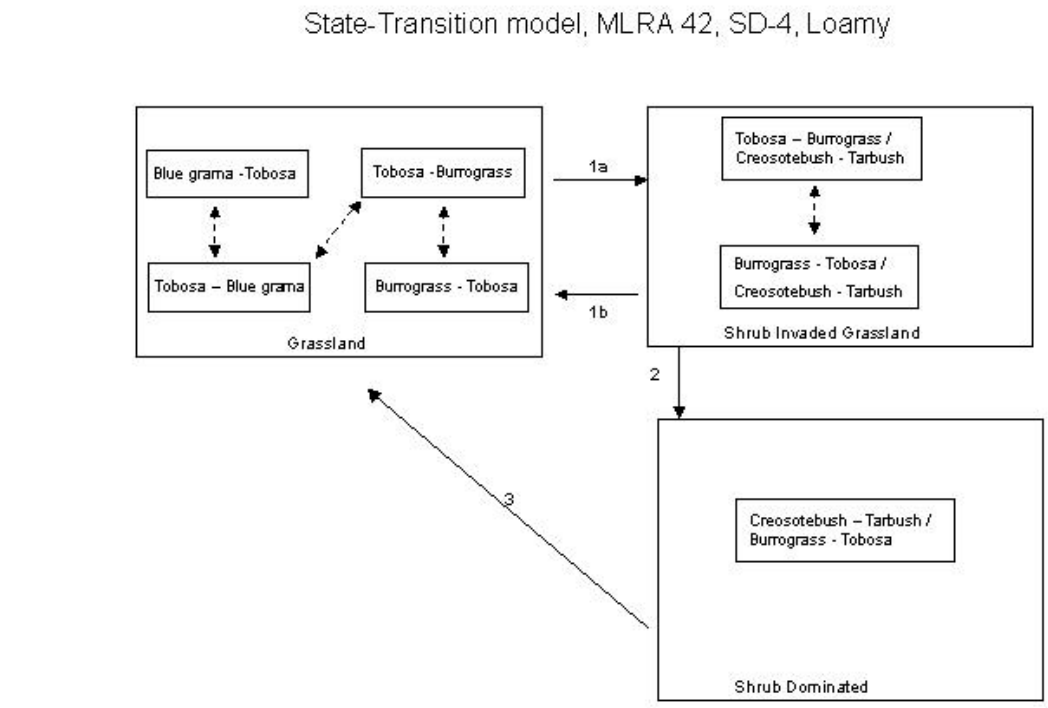
Ecological Dynamics of the Site

Overview

The aspect of this site's historic plant community is open prairie grassland. This site is positioned in a topographic setting to receive run-on water from adjacent gravelly and shallow sandy sites. Short grasses dominate with varying amounts of mid to tall grasses occupying the moister microclimates within the site. Blue grama and tobosa are the dominant grass species. Occasional forbs and woody shrubs occur in association with the grasses. Broad collections of soil series are often grouped into the loamy site and the differences in these series can often account for variations in the plant communities. Grass species dominance fluctuates between blue grama and tobosa, and can be affected by soil texture, landscape position, and disturbance. Retrogression within the grassland state is characterized by a decrease of blue grama, and an increase in tobosa, burrograss and tarbush.

Transition to a shrub-invaded state is facilitated by loss of grass cover due to drought or overgrazing. Fire suppression and increased winter precipitation may also be important components favoring shrub seedling establishment. Continued reduction in grass cover and increased erosion may eventually lead to a shrub-dominated state. Once erosion has removed soil surface horizons, shrub removal will not result in grass recovery. Few systematic studies of vegetation dynamics have been preformed within the SD-4 Loamy ecological site. Generally this site is less susceptible to shrub encroachment than those sites receiving less run-on water.

Plant Communities and Transitional Pathways (diagram)



1a. Drought, overgrazing- reduction in grass cover, fire suppression: 1b.Brush control, prescribed grazing

2. Severe reduction of grass cover, increased bare patch size, soil crusting, decreased infiltration, erosion, increased shrub density, resource redistribution.

3.Brush control, reestablish hydrologic function, range seeding, decreased erosion.

Grassland State


- Tobosa-blue grama community
- Grass cover very high
- Reyab loam, Fort Bliss Soil Survey, Otero Co.

Shrub-invaded state


- Tobosa-burrograss / Tarbush
- Grass cover moderate
- Bare patches evident
- Reyab loam, Fort Bliss Soil Survey, Otero Co.

Shrub-invaded state


- Burrograss-tobosa / Creosotebush
- Grass cover moderate to low
- Number and size of bare patches increasing, soil surface crusts present
- Evidence of erosion, note pedestalling

Shrub-dominated state


- Creosote / burrograss-tobosa, tobosa scattered in clumps
- Grass cover low
- Salado loam, Fort Bliss Soil Survey, Otero Co.

Shrub-dominated state


- Tarbush / burrograss-tobosa
- Grass cover very low
- Soil surface sealing, reduced infiltration
- Salado loam, Fort Bliss Soil Survey, Otero Co.

Gullied State

- Creosote / burrograss
- Grass cover very low
- Gullying changed hydrology, dried site
- Reyab loam, Fort Bliss Soil Survey, Otero Co.

State Containing Historic Climax Plant Community

Grassland State: Blue grama and tobosa are the dominant grass species of the historic plant community. Additional species such as cane bluestem, sideoats grama, green sprangletop, plains lovegrass, alkali sacaton, and vine mesquite inhabit areas within the site that are situated to receive extra run-on water. Important forbs include croton, bladderpod and globemallow. Woody species such as winterfat, soaptree yucca, ephedra, tarbush, cholla and prickly pear appear in limited amounts sparsely scattered across the site.

Tobosa usually dominates on the silt loam *Reyab* soil series that occur in lower landscape positions, whereas blue grama dominates on the higher and drier *Salado* series (Fort Bliss Soil Survey). Tobosa seems to be better adapted to those soils that have relatively long periods of soil moisture availability. Blue grama is drought resistant and makes use of limited available water on the Salado soils. Salado series also have a calcic horizon at about 20 inches.

Species diversity decreases with heavy grazing pressure and/or drought. As retrogression occurs, secondary species such as green sprangletop, plains lovegrass, sideoats grama and Arizona cottontop are the first to decline, these are followed by a decrease in vine mesquite, alkali sacaton, cane bluestem, blue grama, and winterfat. As a result of declines in these competitors, tobosa may increase, at least initially. Tobosa decreases and is eventually replaced by burrograss as the site continues to degrade. This increase in burrograss may indicate that the site is vulnerable to encroachment by shrubs and soil degradation.

Diagnosis: Grass cover is fairly uniform with few large (< 1 m) gaps. Tobosa and blue grama are dominant grasses. Shrubs such as soaptree yucca, ephedra, winterfat, tarbush, prickly pear and cholla are sparsely scattered or absent. Creosotebush is not present. Evidence of erosion including rills, pedestaling and litter movement is minimal.

Ground Cover and Structure: presently being revised. _____

Plant Community Annual Production (by plant type): _____

Annual Production (lbs/ac)

Plant Type	Low	RV	High
Grass/Grasslike	725	1140	1520
Forb	60	48	74
Tree/Shrub/Vine	15	12	6
Lichen			
Moss			
Microbiotic Crusts			

Plant Community Composition and Group Annual Production:

Plant Type - Grass/Grasslike

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
1	PLMU3	Tobosa	300-360	300-360
2	BOGR2	Blue grama	300-360	300-360
3	BOBA3	Cane bluestem	50-75	120-144
3	BOCU	Sideoats grama	50-75	
3	PAHA	Hall's panicum	25-50	
3	PAOB	Vine mesquite	75-100	
4	MUAR2	Sand muhly	75-100	96-120
4	SPAI	Alkali sacaton	75-100	
4	SPCR	Sand dropseed	25-50	
5	DICA8	Arizona cottontop	30-45	60-96
5	ERIN	Plains lovegrass	30-45	
5	LEDU	Green sprangletop	30-45	
6	ARIST	Threeawn	36-60	36-60
6	MUAR	Ear muhly	36-60	
6	SCBR2	Burrograss	36-60	

Plant Type - Forb

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
7	CROTO	Croton	12-24	12-24
7	LESQU	Bladderpod	12-24	
7	SPHAE	Globemallow	12-24	
8	2FP	Perennial forbs	6-12	6-12
9	2FA	Annual forbs	6-12	6-12

Plant Type – Tree/Shrub/Vine

Group Number	Scientific Plant Symbol	Common Name	Species Annual Production	Group Annual Production
10	EPHED	Ephedra spp.	3-6	3-6
10	FLCE	Tarbush	3-6	
10	KRLA2	Winterfat	3-6	
11	OPUNT	Prickly pear	3-6	3-6
11	YUEL	Soaptree yucca	3-6	
11	OPSP2	Cholla	3-6	

Plant Growth Curves

Growth Curve ID 5801

Growth Curve Name: HCPC Grassland State

Growth Curve Description: SD-4 Warm Season Grassland - Average rainfall year

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	0	3	3	8	7	18	28	25	6	2	0

Additional States:

Shrub Invaded Grassland State: This state is characterized by the invasion of creosotebush and/or an increase in tarbush. Tobosa and burrograss are the dominant grass species of this state. Retrogression within this state results in a reduction of grass cover and an increase in creosotebush or tarbush. As grass cover is reduced organic matter is reduced and infiltration and soil aggregate stability decline.[4] This results in increased erosion rates and lower available soil moisture. Grazing management needs to be implemented to maintain or increase adequate grass cover to protect soil resources and impede shrub seedling establishment.

The presence of creosotebush on adjacent gravelly sites may increase the probability of creosotebush encroachment on the loamy site. Those loamy soils with calcareous horizons or even small amounts of gravel in the profile, such as in *Salado* soil series, seem to be at greater risk of invasion by creosotebush.

Diagnosis: Tobosa and burrograss cover is variable and can range from fairly uniform to patchy. Creosotebush is present and/or there is an increased representation of tarbush. Creosotebush-tarbush canopy cover may eventually approach co-dominance with grasses.

Transition to Shrub Invaded Grassland (1a)

Periods of severe drought can reduce grass production, cover, and composition regardless of whether or not the site is being grazed[2]. Reduction in production and grass cover due to drought or overgrazing results in an increase in the amount and size of bare patches. These patches may provide competition-free sites and facilitate shrub seedling establishment. Years of above average precipitation during winter month may favor shrub establishment by making soil moisture available to shrubs during periods of C_4 grass dormancy.[1] If fire historically played a part in Chihuahuan Desert grasslands ecology then fire suppression may aid shrub establishment.[3]

Key indicators of approach to transition:

- Loss of vine mesquite, an indicator of decreasing species diversity.
- Loss of blue grama cover.
- Increase in burrograss cover.
- Increases in bare patch size.
- Appearance of creosotebush or tarbush seedlings.

Transition back to Grassland (1b)

Brush management may be necessary to remove competition from shrubs and restore cover. Allow natural revegetation of grasses to occur following brush control. Control of forage utilization through prescribed grazing will help to ensure recovery and increase cover.

Shrub Dominated State: Shrubs dominate this state in both composition and aspect. Grass cover is limited and large interconnected bare patches occupy areas between shrubs. Burrograss is the dominant grass, threeawns increase and clumps of tobosa are scattered across the site occupying the more protected areas or positions receiving a little more moisture. Increased shrub density and decreased grass cover characterize retrogression within this state. Reduction of grass cover and increased physical soil crusts reduce infiltration and available soil moisture. Slope, amount and timing of overland flow the site receives, soil aggregate stability, and amount of physical and biological crusts influence soil erosion rates on this site.

Diagnosis: Creosotebush, tarbush or a mix of both are present and dominate the site. Grass cover is sparse with frequent interconnected large bare patches (>1m). Physical soil crusts are present reducing infiltration and available soil moisture. Evidence of erosion including rills, pedestals and litter movement can be common. Gullies may be present.

Transition to Shrub-dominated state (2)
Continued overgrazing and/or drought further reduce grass production and cover, favoring shrub expansion by decreasing organic matter, and reducing competition for resources between grasses and shrub seedlings. The formation of soil surface physical crusts decreases infiltration and impedes grass seedling establishment. Lack of adequate grass cover also eliminates the opportunity for natural or prescribed fires to suppress shrubs. Once shrubs are established, the redistribution of water and nutrient resources around shrubs favors further shrub growth and recruitment. Periods of above-average precipitation during winter months may also favor shrub establishment and growth.[1]

Key indicators of approach to transition:

- Increase in amount of creosotebush or tarbush seedlings and young plants.
- Increases in the number of bare patches and decreases in overall grass cover.
- Increases in bare patch size
- Soil surface physical crusting
- Increased evidence of erosion such as rills, small gullies or pedestaling of plants.

Transition back to Grassland (3)
Brush management is necessary to remove competition from shrubs. Range seeding is needed to supply adequate seed source. Pitting and seeding prior to summer rains may help break up soil physical crusts, create small pits to hold water and increase survival of grass seedlings. Soil physical crusts, loss of organic matter, and degree of erosion affect the probability of successful grass establishment.

Gullied State: This state is characterized by erosion and a change in hydrology. Loamy sites receive run-on water from higher adjacent sites. A change in natural flow patterns can cause a concentration of overland flow, accelerated erosion, and subsequent gully formation. Burrograss is the dominant grass species. . Threeawns and fluffgrass are also present. Creosotebush or tarbush is the dominant shrub.

Transition to Gullied state (4)
Loss of adequate grass cover necessary to protect soil from run-on water from higher adjacent sites can facilitate this transition. Reduced cover, organic matter, and soil aggregate stability increase susceptibility to erosion and subsequent gully formation. This transition can be caused by both offsite (concentration of overland flow) and onsite (decreased soil stability) factors.

Key indicators of approach to transition:

- Rills or small gullies along roads or trails running parallel with slope on adjacent upland sites.
- Increased evidence of physical soil crusts and water flow patterns.
- Increased evidence of erosion such as rills, small gullies.

Transition back to Grassland (5)
Erosion control practices are essential to restore hydrology. Brush management is needed to remove competition from shrubs and allow grass seedling establishment. Range seeding is required to supply adequate seed source for blue grama, tobosa, and other grasses originally present in grassland state. Grazing management is necessary to defer grazing until plants are established following seeding and insure proper forage utilization once grazing is resumed. Management practices required to drive the transition back to grassland are costly and chances for successful grass establishment are dependent on adequate precipitation following seeding and degree of soil degradation.

ECOLOGICAL SITE INTERPRETATIONS

Animal Community:

Wildlife: This site provides habitat which supports a resident wildlife community characterized by pronghorn antelope, coyote, badger, black-tailed prairie dog, red-tailed hawk, meadow lark, horned lark and prairie rattlesnake.

Hydrology Functions:

This site normally receives approximately 12-14 inches annual precipitation. Most summer rainfall occurs as brief sometimes-heavy thunderstorms. Soils are deep to very deep and rated as being in hydrologic group B. Slopes range from 0- 5 percent. Permeability is moderately slow. Runoff is low to medium, and the hazard of water erosion is slight to moderate. Available water capacity to a depth of 40 inches is moderate. As basal cover and litter are reduced and the size of gaps between vegetation increases, the surface soils become exposed to accelerated erosion.

Recreational Uses:

This site offers good potential for antelope and predator hunting, wildlife observation and photography. Scenic beauty of this site will especially appeal to those who value wide open prairie grasslands.

Wood Products:

This site has no significant value for wood products.

Other Products:

Grazing: Currently the majority of the livestock use on this site is with mother cows in cow-calf operations. Historic use has been sheep and cattle. The plant community on this site is well suited to grazing by both domestic livestock of all kinds and by wildlife at all seasons of the year. This site responds best to a system of management that rotates the season of use.

Initial starting stocking rates will be determined with the landowner or decision-maker. They will be based on past use histories and type and condition of the vegetation. Calculations used to determine an initial starting stocking rate will also be based on forage preference ratings.

Other Information:

Plant Preference by Animal Kind:

Animal Kind: **Cattle**

Animal Type:

Common Name	Scientific Name	Plant Part	Forage Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
Tobosa	Pleuraphis mutica	EP	U	U	D	D	D	D	D	D	U	U	U	U
Blue grama	Bouteloua gracilis	EP	D	D	P	P	P	P	P	P	P	P	P	D
Cane bluestem	Bothriochloa barbinodis	EP	U	U	P	P	P	D	D	D	U	U	U	U
Sideoats grama	Bouteloua curtipendula	EP	D	D	P	P	P	P	P	P	D	D	D	D
Hall's panicum	Panicum hallii	EP	D	D	P	P	P	P	P	P	P	P	P	D
Vine mesquite	Panicum obtusum	EP	D	D	P	P	P	P	P	P	P	P	P	D
Sand muhly	Muhlenbergia arenicola	EP	D	D	P	P	P	P	P	P	P	P	P	D
Alkali sacaton	Sporobolus airoides	EP	U	U	D	D	D	D	D	D	U	U	U	U
Sand dropseed	Sporobolus cryptandrus	EP	D	D	P	P	P	D	D	D	D	D	D	D
Arizona cottontop	Digitaria californica	EP	P	P	P	D	D	P	P	P	D	D	D	P
Plains lovegrass	Eragrostis intermedia	EP	D	D	P	P	P	D	D	D	D	D	D	D
Green sprangletop	Leptochloa dubia	EP	D	D	P	P	P	P	P	P	P	P	P	D
Threeawn	Aristida	EP	U	U	D	D	D	U	U	U	U	U	U	U
Ear muhly	Muhlenbergia arenacea	EP	U	U	D	D	D	D	D	D	U	U	U	U
Burrograss	Scleropogon brevifolius	EP	U	U	U	U	U	U	U	U	U	U	U	U
Croton spp.	Croton	EP	D	D	D	D	D	D	D	D	D	D	D	D
Bladderpod	Lesquerella	EP	D	D	D	D	D	D	D	D	D	D	D	D
Globemallow	Sphaeralcea	EP	D	D	D	D	D	D	D	D	D	D	D	D
Perennial forbs		EP	D	D	D	D	D	P	P	P	P	P	P	D
Annual forbs		EP	D	D	P	P	P	P	P	P	D	D	D	D
Ephedra spp.	Ephedra	S	D	D	U	U	U	U	U	U	U	U	U	D
Tarbush	Flourensia cernua	EP	U	U	U	U	U	U	U	U	U	U	U	U
Winterfat	Krascheninnikovia lanata	S&L	P	P	D	D	D	D	D	D	D	D	D	P
Plains pricklypear	Opuntia polyacantha	F, F/S	U	U	U	U	U	U	U	U	U	U	U	U
Soaptree yucca	Yucca elata	F&F/S	U	U	D	D	D	D	D	D	U	U	U	U
Walkingstick cholla	Opuntia imbricata	F&F/S	U	U	U	U	U	U	U	U	U	U	U	U

SUPPORTING INFORMATION

Associated sites:

Site Name	Site ID	Site Narrative
Shallow Sandy **Gravelly**	**042XD006NM** **042XD007NM**	This site is positioned in a topographic setting to receive run-on water from adjacent gravelly and shallow sandy sites.

Similar sites:

Site Name	Site ID	Site Narrative

Inventory Data References (narrative):

Supporting information includes limited clipping data, soil survey investigations, aerial photographs, and personal observations.

Inventory Data References:

Data Source	# of Records	Sample Period	State	County
NM-Range-26	**12**	**1998-2000**	**New Mexico**	**Otero**

State Correlation:

This site has been correlated with the following sites:

Type Locality:

State: **NM**

County: **035**

Latitude:

Longitude:

Township: **24 S.**

Range: **13 E.**

Section: **15**

Is the type locality sensitive? **Yes** ☐ **No** ☒

General Legal Description: **Otero County, New Mexico; on Otero Mesa about 1.8 miles south on County Road 506 from the guard station on the east gate of the McGregor Range and 250 feet west of the road;NW 1/4, NW1/4 section 15, T.24S., R.13E.**

Relationship to Other Established Classifications:

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Fort Bliss and Otero County.
Characteristic taxonomic units are:
Fort Bliss SSA:
49-Reyab loam 0 to 1 percent slopes
50-Reyab loam 1 to 5 percent slopes
59-Salado loam 1 to 3 percent slopes
65-Armesa-Salado complex (Salado part)
Other soils included are:

Other References:

1. Moir, W. H., and J. A. Ludwig. 1991. Plant succession and changing land features in desert grasslands. P. 15-18. In P.F. Ffolliott and W.T. Swank (eds.) People and the temperate region: a summary of research from the United States Man and the Biosphere Program 1991. U.S. Dept. State, Publ No. 9839, Nat. Tech. Info. Serv., U.S. Dept. Commerce, Springfield, Illinois. 63 p.

2. Holechek, J.L., R.D. Pieper, and C.H. Herbel. 1989. Range Management Principles and Practices. Prentice-Hall, Inc. Englewood Cliffs, New Jersey.

3. Brooks, M.L., and D.A. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pages 1–14 *in* K.E.M. Galley and T.P. Wilson (eds.). Proceedings of the Invasive Species Workshop: the Role of Fire in the Control and Spread of Invasive Species.
Fire Conference 2000: the First National Congress on Fire Ecology, Prevention, and Management. Miscellaneous Publication No. 11,
Tall Timbers Research Station, Tallahassee, FL.

4. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheets. Rangeland Soil Quality—Organic matter, infiltration, soil aggregate stability. Rangeland Sheets 6,5,3, [ONLINE] Available:
http://www.statlab.iastate.edu/survey/SQI/range.html

Site Description Approval:

{PRIVATE}Author	Date	Approval	Date
David Trujillo & Dr. Brandon Bestelmeyer	9/10/00	George Chavez	2/20/03

Site Description Revision:

{PRIVATE}Author	Date	Approval	Date